Staff Report to the Planning Commission

Application Number: 09-0200

Applicant: Steve Wiesner, Department of Public Works
Owner: County of Santa Cruz
APN: 066-092-15, 16, 066-162-13, 27, 44, 066-163-28, 26, 12, 27, 16, 18, 19, 20, 26, 066-211-03, 04, 066-212-02, 03, 04, 05, 066-221-06, 066-222-01, 02

Agenda Date: July 22, 2009

Agenda Item #: 11
Time: After 1:30 p.m.

Summary Project Description: Roadway and drainage improvements to Graham Hill Road to include a turn lane at Roaring Camp Railroad, shoulder improvements, grading of approximately 7200 cubic yards, removal of 52 trees and drainage improvements along a 0.6-mile stretch of Graham Hill Road.

Location: The project is located on Graham Hill Road south of Felton, CA., beginning 1,750 feet north of the intersection with Summit Avenue and ending approximately 1,500 feet south of the intersection with Summit Avenue.

Supervisoral District: 5th District (District Supervisor: Mark Stone)

Permits Required: Riparian Exception and Grading Approval
Technical Reviews: Biotic Report

Staff Recommendation:

- Approval of the Addendum to the Negative Declaration issued for application 00-0388.
- Approval of application 09-0200, based on the attached findings and conditions.

Exhibits

A. Project plans
B. Findings
C. Conditions
D. Planning Commission staff report for 00-0368
E. Addendum to the Negative Declaration
F. Summary and conclusions of Biotic Assessment and Addendum

Parcel Information

Parcel Size:	NA – County Right of Way
Existing Land Use - Parcel:	Roadway
Existing Land Use - Surrounding:	Mountain Residential, Parks and Recreation, Public Facility
Project Access:	Graham Hill Road
Planning Area:	Felton
Land Use Designation:	N/A
Zone District:	N/A
Coastal Zone:	__ Inside X Outside
Appealable to Calif. Coastal Comm.	__ Yes X No

Environmental Information

Geologic Hazards:	Not mapped/no physical evidence on site.
Soils:	Soquel Loam, Zayante Coarse Sand.
Fire Hazard:	Not a mapped constraint.
Slopes:	New cut slopes along the roadside at 2:1.
Env. Sen. Habitat:	Riparian, wetland, Sandhills habitat.
Grading:	6200 cubic yards of cut, 1000 cubic yards imported fill.
Tree Removal:	52
Scenic:	Designated scenic road.
Drainage:	Drainage improvements are proposed in the roadside ditch, for safety, and in the ephemeral stream for restoration and to preserve an old-growth redwood.
Archeology:	Survey performed, resources absent.

Services Information

Urban/Rural Services Line:	__ Inside X Outside
Water Supply:	NA
Sewage Disposal:	NA
Fire District:	County Fire, Felton Service Area
Drainage District:	Zone 8 Flood Control/ Water Conservation District

Detailed Project Description

A. Construct 200 lineal feet of 11 ft wide left turn lane to serve the Roaring Camp Railroads theme park.
B. Construct 3,220 lineal feet of continuous 3 ft wide asphalt paved shoulder on the north side of Graham Hill Road. Approximately 775 lineal feet of 3 ft wide asphalt paved shoulder is proposed to be constructed on the south side of Graham Hill Road from the private driveway entrance at Pro Build to approximately 300 ft southeast of the Roaring Camp Railroads driveway entrance.
C. Construct 0.17 feet thick asphalt pavement overlay over the entire new road surface for the full project length (3,220 ft).

D. Hold the existing road alignment and profile of Graham Hill Road for the full length of the project (3,220 lineal feet). Hold the existing right edge of pavement of Graham Hill Road beginning at approximately 300 lineal feet southeast of the Roaring Camp Railroads driveway entrance to the end of project (~2,400 lineal feet total).
E. No retaining walls are proposed under the revised project. All earth cuts are to be 1 : 1, and all earth fills are proposed to be 1.5 : 1.
F. The Roaring Camp Railroad driveway entrance is to remain reconfigured as in the original Graham Hill Road project so that it meets current accepted County standards for private driveway geometry.
G. Construction of approximately 1,450 lineal feet of new primary 48" diameter storm drainpipe to carry the 25-year flows from the total tributary drainage basin. The outlet of the primary storm drainpipe is at the tributary side drainage channel to Zayante Creek just west of the railroad track crossing at Graham Hill Road (approx. project Station 11+00). A reinforced concrete energy dissipater structure is proposed at the outlet. A silt and grease trap manhole is proposed to be constructed just before the concrete outlet structure. In addition to the 1,450 lineal feet of 48" diameter primary storm drain system, approximately 860 lineal feet of additional storm drainpipe (cross culverts and tributary systems) is proposed to be constructed.
H. Approximately 53 property easements and right-of-ways are necessary to be acquired.
I. Approximately 6,200 cubic yards of earth excavation and 1,000 cubic yards of imported earth borrow are required for construction of the project.
J. The number of trees 4 inches or greater required to be cut for the project is 52.

Project History and Environmental Review

This project is a small-scale version of a road improvement project that was approved by the Planning Commission on October 9, 2002 under application number 00-0368. That project included the current work, plus more grading with retaining walls to allow for more extensive widening. The public hearing for 00-0368 was preceded by extensive consultation with the public through a series of public workshops. The project was approved and the CEQA document (negative declaration with mitigations) certified (see exhibits D and F). For funding reasons the project was delayed and the approval expired. The Department of Public Works (DPW) resubmitted an application (06-0388) on August 7, 2006 for a scaled back version of the project. The Notice of Determination was filed with the Clerk of the Board on April 10, 2007. The project was further scaled back and the current application was submitted on June 3, 2009. DPW held a public meeting for the revised project September 23, 2008 to reintroduce this project to the public and entertain any concerns.

The Environmental Coordinator has reviewed the previous CEQA determination and the impacts and mitigations required for the revised project and has found that the revised project has significantly less impact than the previously approved project, and that the mitigation measures required of the previously approved project provide as much or more reduction and prevention of potential impacts. CEQA Guidelines allow for an addendum to an approved EIR or Negative Declaration where only minor technical changes or additions are necessary. With the approval of the attached addendum the 2002 CEQA determination is valid for this project and recirculation or recertification is not required. This determination is consistent with the NEPA determination that the scaled back project requires no further review under federal guidelines.

Project Setting

Graham Hill Road was originally constructed in the 1840s, and first paved in 1954 along the alignment of the old road. It has the geometry and symmetry of a winding country road. However, as the area has become developed the Average Daily Traffic (ADT) on Graham Hill has increased to between 13,000 and 16,600 cars per day. The country road has evolved into an important artery that connects Santa Cruz and points south with the San Lorenzo Valley.

Graham Hill Road is bounded to the southwest along the project reach by Henry Cowell State Park and Roaring Camp Railroad. To the northwest are private residences and the County Juvenile Correctional Facility.

The steep downward grade toward Felton, limited sight distance around curves, tight radii of the curves, and unimproved drainage ditch along side the driving lanes, which are hallmarks of this road, combine with the increasing number of vehicles to create a serious need for safety improvements. In 2001 the roadway was grooved in an effort to improve safety. This effort was successful in reducing collisions between 60 and 70 percent, calculated in 2004. The proposed improvements focus on safety concerns related to the open roadside drainage ditch, driveways, and turn lanes at Roaring Camp Railroad.

Design Review

The primary scenic impacts of this project will be the laying back of the near vertical slopes along the northern side of the roadway. The concrete retaining walls that were a feature of the previously approved project have been deleted from this proposal. The project includes a revegetation plan for this section that incorporates native plants and replaces trees at a 3 to 1 ratio. This project has been reviewed by the County's Urban Designer and has been found to comply with the requirements of the County Design Review Ordinance, in that the proposed project will incorporate site design features such as revegetation with native plants along the cut slopes adjacent to the road and restoration of the riparian corridor to reduce the visual impact of the proposed development on the scenic corridor and the natural landscape.

Studies Included

In addition to the studies listed in the staff report for application 00-0368, which were relied upon for this scaled back project, the Biological Assessment was revised to address the smaller scale project and advances in the scientific information for determining the extent of Sandhills habitat. The Addendum to the Biological Assessment (Biotic Resources Group, January 2009) includes an updated project description, identifies temporary and permanent impacts to biological resources and quantifies the area of disturbance relative to identified endangered species. The primary change in impacts to sensitive habitat between the previously approved project and the current proposal is in the way Sandhills habitat, and the potential for presence of the Mt. Herman June beetle, is determined. While the footprint of the project in the vicinity of the Sandhills habitat has not changed, the area determined to be Sandhills habitat has increased from approximately 1,200 square feet to 0.54 acres. The previously approved mitigation for the impacts to Sandhills/June beetle habitat, removal of non-native invasives from a nearby County

facility, has since been undertaken as mitigation for another project. The current proposal includes on-site restoration in the area determined to be Sandhills habitat, and the purchase of credits from the Sandhills Conservation Bank (the Bank), as a means to mitigate the impacts to Sandhills habitat. The Bank did not exist at the time of the previously proposed project, and so was not an option. The use of the Bank as mitigation for impacts to sensitive Sandhills habitat is limited in scope, primarily to mitigate the impacts of infill project in the Scotts Valley – Ben Lomond area. Use of the Bank as mitigation for other impacts to Sandhills habitat is available only with the approval of the Board of Supervisors. On January 13, 2009 the Board of Supervisors approved the use of the Sandhills Conservation Bank credits as mitigation for this project.

The project involves the removal of 52 trees, ranging in size between 4" and 24", with one 48" redwood and one 60" fir the exceptions (this number reflects 30 additional trees recently removed in the project area by PG&E, all of which were targeted for removal under the current project proposal). Of the trees 52 yet to be removed six are redwood, two are Douglas fir, two are cedar, and there are five individuals: eucalyptus, pine acacia, maple and buckeye. The remaining trees are all coastal live oak. The biggest concern raised during the previous permitting process was the removal of trees, which then totaled 185, down from 321 in an earlier version of the proposal. The current project reduces that number by approximately 70%.

The revised project includes the replacement of an undersized 18" culvert across Graham Hill Road with a 48" culvert. The ephemeral stream channel that parallels Graham Hill Road crosses at the foot of a 96" redwood that would be negatively impacted by the excavation required for the headwalls and wing walls for the new culvert, therefore the stream channel has been realigned to protect this old-growth redwood that was targeted for removal under the previous proposal.

Riparian Exception

This project requires a Riparian Exception to allow drainage improvements including the realignment of the drainage along the south edge of Graham Hill Road to move the crossing 40 feet to the west, avoiding impacts to a 96-inch old growth redwood, the installation of culverts along the roadside drainage ditch and intermittent drainage, and an energy dissipater at the downstream end of the project reach, prior to the tributary entering Zayante Creek. The impacts are estimated to be 130 square feet of in-channel jurisdictional wetland, and 836 square feet of other waters of the US. The impacts to these areas will be mitigated through the implementation of a riparian restoration plan in the drainage south of the roadway. The restoration plan includes the removal of non-native invasives and planting with native indigenous in riparian and wetland plants, with a three-year monitoring and maintenance component. The findings can be made for the riparian exception because of the hazard that the roadside drainage ditch presents to drivers that drift to the shoulder, the need to protect an ancient tree while ensuring proper capacity of the culvert that crosses Graham Hill Road, and the need to dissipate the force of the outflow from the new culverts to prevent scour downstream.

Public Hearing

On September 23, 2008, DPW conducted a public meeting to reintroduce this project to the public and entertain any concerns. The meeting was publicly noticed in the Sentinel and Valley

Press, and notices were sent to more than 430 residents in the Graham Hill Road area. The meeting was attended by Supervisor Stone, as well as DPW staff and local residents. The project was well received by the members of the public in attendance, expressing gratification both that the project was moving forward, and that impacts had been further reduced. Questions raised during the meeting were limited to clarifications of the plan, such as on the location of the turn lane and stream crossings, and the timing of the project.

Conclusion

As proposed and conditioned, the project is consistent with all applicable codes and policies of the Zoning Ordinance and General Plan/LCP. The project reflects an appropriate balance of safety improvements and resource protection. The findings required for this project are the Riparian Exception Findings attached as Exhibit "B", which contain a complete listing of findings and evidence related to the above discussion.

Staff Recommendation

- **APPROVAL** of the Addendum to the Negative Declaration issued for application 00-0388.
- **APPROVAL** of Application Number **09-0200,** based on the attached findings and conditions.

Supplementary reports and information referred to in this report are on file and available for viewing at the Santa Cruz County Planning Department, and are hereby made a part of the administrative record for the proposed project.

The County Code and General Plan, as well as hearing agendas and additional information are available online at: www.co.santa-cruz.ca.us

Report Prepared By: _____

Matthew Johnston
Santa Cruz County Planning Department
701 Ocean Street, 4th Floor
Santa Cruz CA 95060
Phone Number: (831) 454-3201
E-mail: pln458@co.santa-cruz.ca.us

Report Reviewed By: _____

Paia Levine
Development Review Manager
Santa Cruz County Planning Department

DIST	COUNTY	ROUTE	POST MILE TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SCr	2302	PM 0.3	1	

COUNTY OF SANTA CRUZ

DEPARTMENT OF PUBLIC WORKS

PROJECT PLANS FOR CONSTRUCTION OF

GRAHAM HILL ROAD IMPROVEMENT PROJECT

Roaring Camp Road to 0.61 Miles East

Federal Project No. RPSTPL-5936 (033)

To be supplemented by Caltrans Standard Plans dated May 2006

INDEX OF SHEETS

APPLICABLE STANDARD PLANS

SEE THE SPECIAL PROVISIONS FOR APPLICABLE CALTRANS STANDARD PLANS AND COUNTY DESIGN CRITERIA PLATES

ABBREVIATIONS

AB	AGGREGATE BASE	EXP	EXPANSION	N	NORTH	SPRR	SOUTHERN PACIFIC RAILROAD
AC	ASPHALT CONCRETE	fs	FLEXURAL STRESS	NE	NORTH EAST	SQ	SQUARE
ADD'L	ADDITIONAL	f'c	WORKING CONCRETE STRESS	No.	NUMBER	SQFT	SQUARE FEET
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION	fy	YIELD STRENGTH	OA	OVERALL	STA	STATION
ANG	ANGLE	(F)	FINISH	OC	ON CENTER	STD	STANDARD
ATT	TELEPHONE UTILITY	FL	FLOWLINE	OH	OVERHEAD	[illegible]	STANDARD
AVE	AVENUE	FRT	FRONT	OL	OVERLAY	STRUCT	STRUCTURE
BKFL	BACKFILL	FT	FEET	PAVE	PAVEMENT	SURF	SURFACE
BLDG	BUILDING	FTG	FOOTING	PC	POINT OF CURVATURE	TANG	TANGENT
BOT	BOTTOM	GA	GAGE	PCC	POINT OF COMPOUND CURVE	TEL	TELEPHONE
BUCK	BUCKEYE TREE	GALV	GALVANIZED	PCC	PORTLAND CEMENT CONCRETE	TOS	TOP OF [illegible]
℄	CENTER LINE	GEO-REINF	GEOGRID REINFORCING FABRIC	PERIM	PERIMETER	TP	TELEPHONE POLE
CHAN	CHANNEL	GH RD	GRAHAM HILL ROAD	PERM	PERMEABLE	TRAP.	TRAPEZOIDAL
CIDH	CAST IN DRILLED HOLE	GM	GAS METER	PERPEND	PERPENDICULAR	TYP	TYPICAL
CIR	CIRCLE	GO	TYPE GO DRAIN INLET	PGE	PACIFIC GAS & ELECTRIC	UP	UNION PACIFIC RR
CL	CLASS, CONTROL LINE	GR	GRADE	PI	POINT OF INTERSECTION	VAR	VARIES
CLR	CLEAR	GRD	GROUND	PL	PROPERTY LINE	VC	VERTICAL CURVE
CMP	CORRUGATED METAL PIPE	H, HT	HEIGHT	[illegible]	POPLAR TREE	VERT	VERTICAL
CONC	CONCRETE	HDPE	HIGH DENSITY POLYETHYLENE	PP	POWER POLE	W	WEST, WIDTH
CONST	CONSTRUCT/CONSTRUCTION	HDWL	HEADWALL	PRC	POINT OF REVERSE CURVATURE	W/	WITH
COORDS	COORDINATES	HORIZ	HORIZONTAL	PROF	PROFILE	WF	WIDE FLANGE
Co.	COUNTY	INV	INVERT	PT	POINT, POINT OF TANGENCY	XING	CROSSING
CP	CONTROL POINT	IP	IRON PIPE	PVC	POLY VINYL CHLORIDE	X-SLOPE	CROSS SLOPE
CULV	CULVERT	JB	JUNCTION BOX	PVI	POINT OF VERTICAL INTERSECTION		
CY	CUBIC YARD	JP	JOINT POLE	R	RADIUS		
DET	DETAIL	JT	JOINT	R.C.	RELATIVE COMPACTION		
DI	DRAINAGE INLET	K	KIPS	RCE, RE	REGISTERED CIVIL ENGINEER		
DIA	DIAMETER	ksf	KIPS PER SQUARE FEET	RCP	REINFORCED CONCRETE PIPE		
DRWY	DRIVEWAY	L	LENGTH	RD	ROAD		
E	EAST	LB	POUND	[illegible]	REDHEAD FASTENER		
EA	EACH	LF	LINEAL FOOT	RDWD	REDWOOD TREE		
EL, ELEV	ELEVATION	LS	LUMP SUM	RE	REGISTERED ENGINEER		
EM	ELECTRICITY METER	LS	LICENSED SURVEYOR	RECONST	RECONSTRUCT		
[illegible]	[illegible]	LT	LEFT	REINF	REINFORCING		
[illegible]	EASED, EASEMENT	M	METER	REQ	REQUIRED		
ENGR	ENGINEER	MAT	GABION ROCK MATTRESS	RR	RAILROAD		
ENTR	ENTRANCE	MATL	MATERIAL	R.R.C	RAILROAD CROSSING		
EP	EDGE OF PAVEMENT	MAX	MAXIMUM	RSP	ROCK SLOPE PROTECTION		
EST	ESTIMATED	MBGR	METAL BEAM GUARD RAILING	RT	RIGHT		
ETW	EDGE OF TRAVELED WAY	MDRN	MADRONE	R/W	RIGHT OF WAY		
EUCLYP	EUCALYPTUS TREE	MH	MANHOLE	S	SLOPE		
EVC	END VERTICAL CURVE	MIN	MINIMUM	SD	STORM DRAIN		
EXCAV	EXCAVATION	MON	MONUMENT	SEC	SECTION		
EXIST, EX (E)	EXISTING	MPH	MILES PER HOUR	SERV	SERVICE		
				SHT(S)	SHEET(S)		

GENERAL NOTES

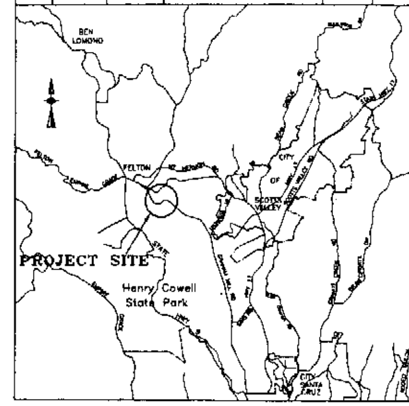
1. ALL CONSTRUCTION SHALL CONFORM TO THE COUNTY OF SANTA CRUZ DESIGN CRITERIA (DATED JUNE 2006) AND THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION STANDARD PLANS AND STANDARD SPECIFICATIONS (DATED MAY 2006).

2. THE CONTRACTOR SHALL BE REQUIRED TO CALL UNDERGROUND SERVICE ALERT (USA) AT (800) 642-2444 AT LEAST 10 DAYS BEFORE STARTING CONSTRUCTION AND FOR PROVIDING THE USA NOTIFICATION NUMBER TO THE ENGINEER AS PER THE SPECIAL PROVISIONS. NO EXCAVATION WORK MAY BEGIN UNTIL ALL UNDERGROUND UTILITIES HAVE BEEN MARKED AND THE USA ID NOTIFICATION NUMBER HAS BEEN GIVEN TO THE ENGINEER.

4. THE CONTRACTOR SHALL BE REQUIRED TO PLAN HIS CONSTRUCTION OPERATIONS TO FULLY WORK AROUND ALL EXISTING OVERHEAD UTILITIES UNLESS THE CONTRACTOR MAKES HIS OWN UTILITY RELOCATION OR OTHER ARRANGEMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING AND COORDINATING HIS CONSTRUCTION ACTIVITIES TO ALLOW THE VARIOUS UTILITY COMPANIES ACCESS TO THE CONSTRUCTION SITE TO RELOCATE UNDERGROUND UTILITIES DURING CONSTRUCTION.

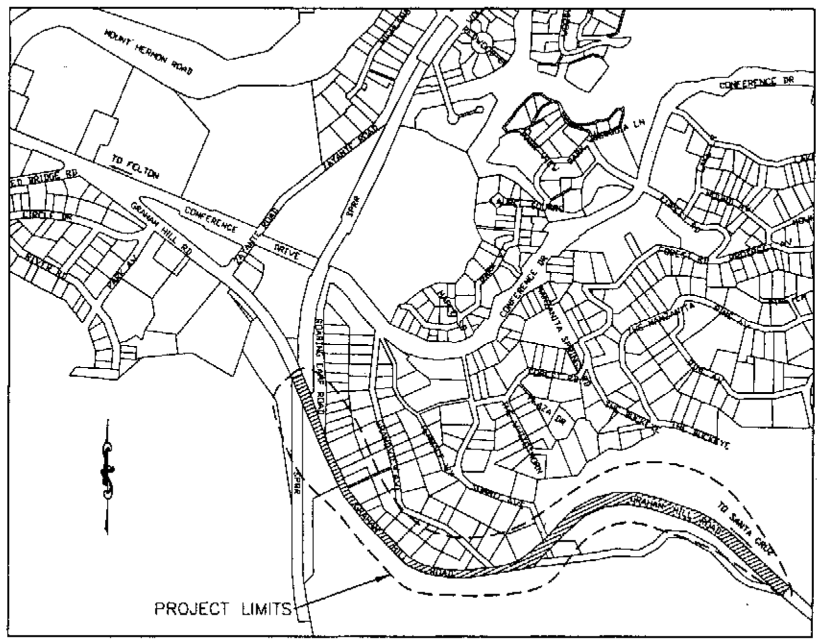
5. THE ENGINEER PREPARING THESE CONSTRUCTION PLANS SHALL NOT BE RESPONSIBLE OR LIABLE FOR UNAUTHORIZED CHANGES TO OR USE OF THESE PLANS OR SPECIAL PROVISIONS. ALL CHANGES TO THESE PLANS AND SPECIAL PROVISIONS MUST BE APPROVED BY THE SANTA CRUZ COUNTY DEPARTMENT OF PUBLIC WORKS AND THE ENGINEER.

6. THE CONTRACTOR SHALL POSSESS A CLASS "A" CONTRACTOR'S LICENSE AT THE TIME THE CONTRACT FOR THIS PROJECT IS AWARDED.



COUNTY LOCATION MAP

(NTS)



VICINITY MAP

Not To Scale

Senior Roads Design Engineer
Registered Civil Engineer

REGISTERED PROFESSIONAL ENGINEER · STEVE WIESNER · No. 54814 · Exp. 12-31-09 · CIVIL · STATE OF CALIFORNIA

Assistant Director of Public Works
Transportation Division
Registered Civil Engineer

REGISTERED PROFESSIONAL ENGINEER · JOHN PRESLEIGH · No. 42601 · Exp. 3-31-10 · CIVIL · STATE OF CALIFORNIA

Director of Public Works
Registered Civil Engineer

REGISTERED PROFESSIONAL ENGINEER · THOMAS L. BOLICH · No. 28442 · Exp. 3-31-08 · CIVIL · STATE OF CALIFORNIA

Chair, Board of Supervisors

Plans Approval Date

County Project No.	40265

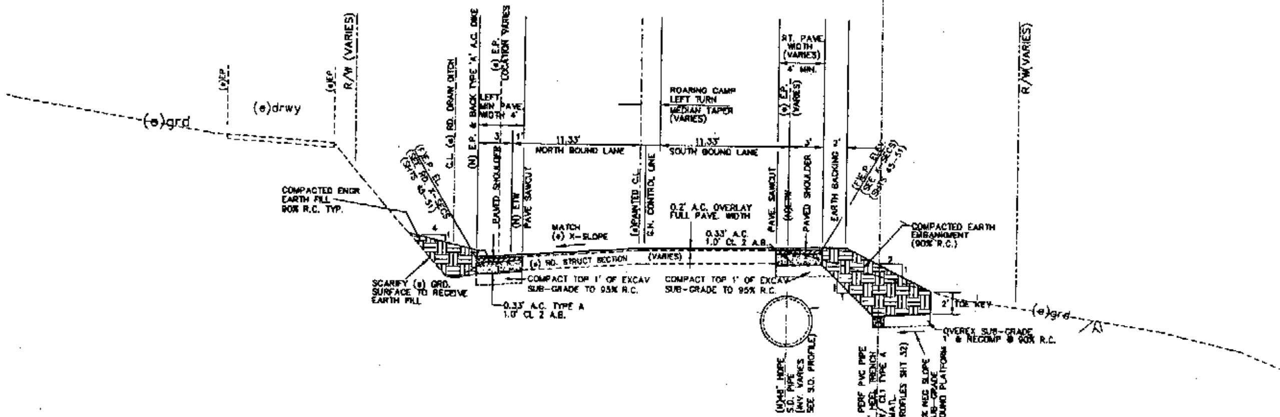
Reviewed by: ADA Engineer: CARL ROM

Reviewed by: Traffic Engineer: JACK SOHRIAI

Reviewed by: Road Superintendent: TERRY REYNOLDS

Reviewed by: Construction Manager: LAURIE GOESSEL

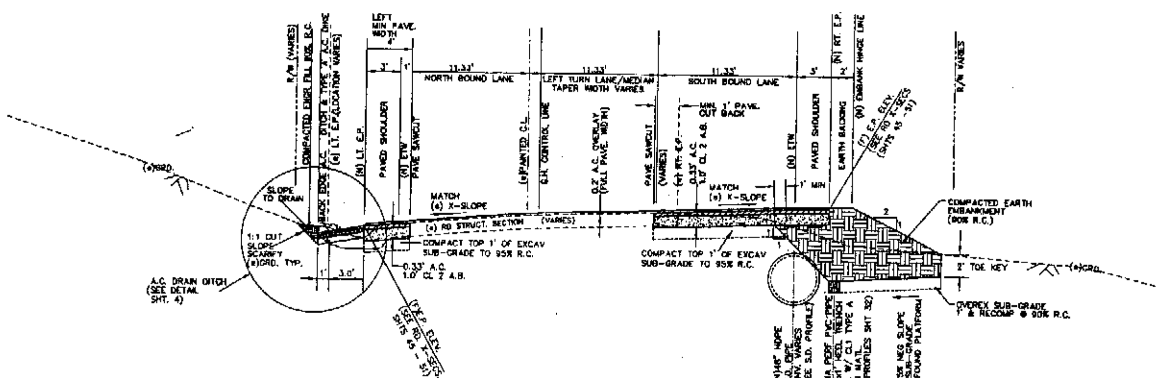
EXHIBIT A



TYPICAL ROAD SECTION

STA 19+59 – 21+55

SCALE: 1" = 5'



TYPICAL ROAD SECTION

ROARING CAMP LEFT TURN LANE & MEDIAN

STA 12+67 – 19+59

SCALE: 1" = 5'

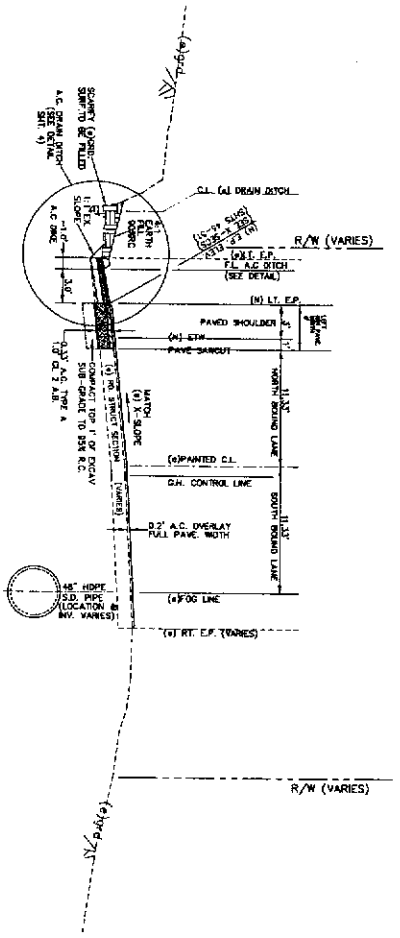
TYPICAL ROAD SECTIONS

COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS	PROJECT ENGINEER
GRAHAM HILL RD. IMPROVEMENT PROJECT ROARING CAMP RD. – 0.61 MILES EAST	C. VESTER

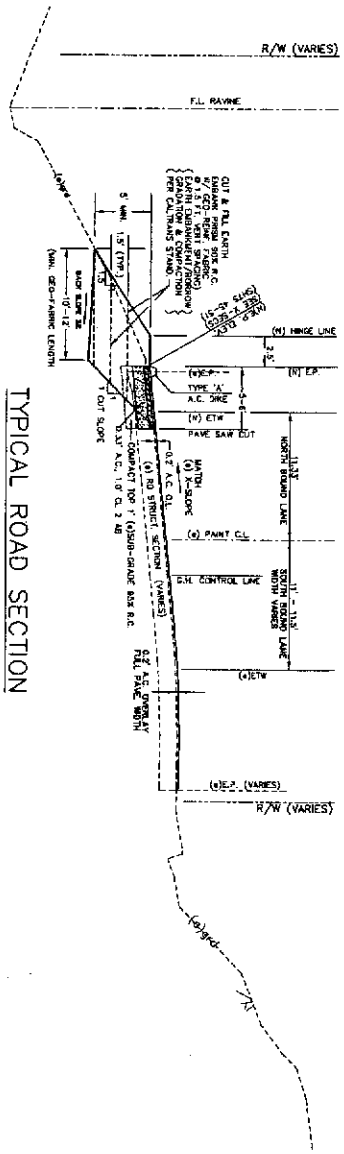
DRAWN: CIV
CHECKED: SBW
DATE: 02/09
SCALE: AS SHOWN
JOB NO. 40265
SHEET 2 OF

EXHIBIT A

EXHIBIT A



TYPICAL ROAD SECTION
STA 21+55 – 23+92
SCALE: 1" = 5'

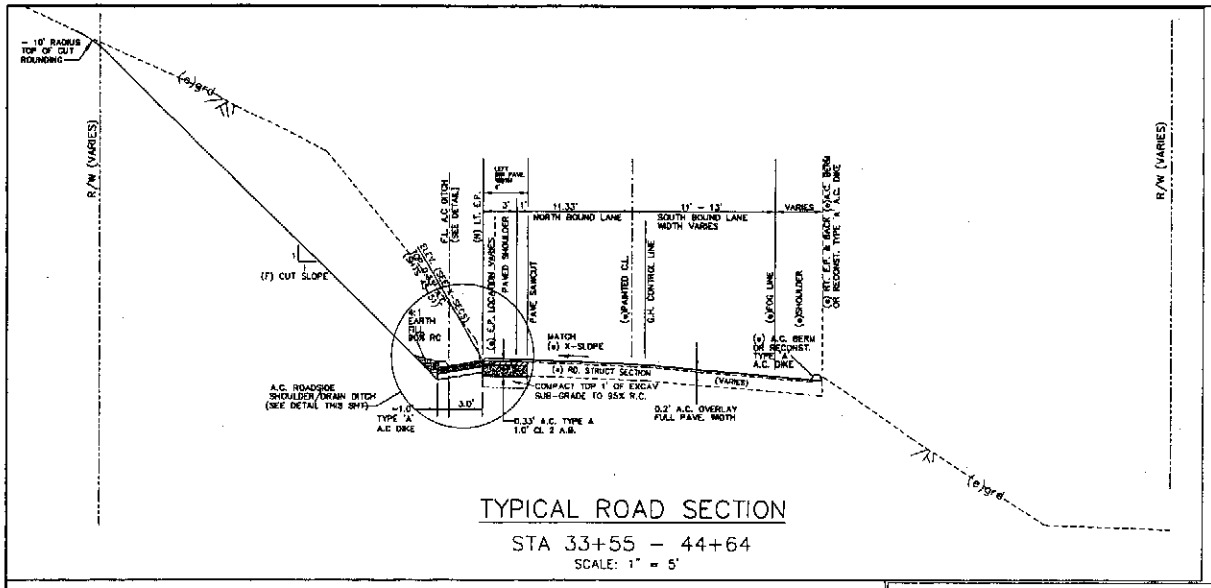


TYPICAL ROAD SECTION
STA 23+92 – 30+34
SCALE: 1" = 5'

TYPICAL ROAD SECTIONS

SHEET NAME: TYPICAL SECTIONS
DRAWING NAME:

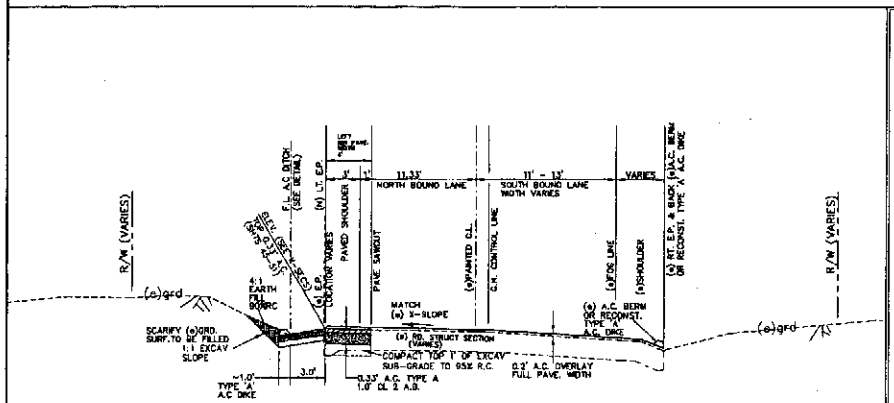
SHEET 3 OF	COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS	PROJECT ENGINEER	DATE / REVISION / BY
JOB NO. 40265	GRAHAM HILL RD. IMPROVEMENT PROJECT	C. VESTER	
SCALE: AS SHOWN	ROARING CAMP RD. – 0.61 MILES EAST		
DATE: 02/09			
CHECKED: SBW			
DRAWN: CIV			



TYPICAL ROAD SECTION

STA 33+55 – 44+64

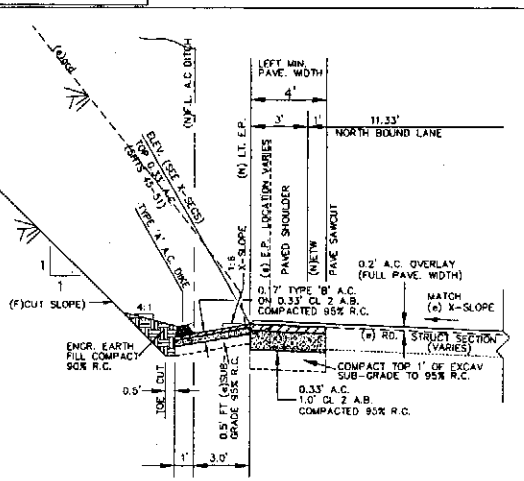
SCALE: 1" = 5'



TYPICAL ROAD SECTION

STA 30+34 – 33+55

SCALE: 1" = 5'



DETAIL – ROADSIDE A.C SHOULDER DRAIN DITCH (TYP.)

SCALE: 1" = 3'

TYPICAL ROAD SECTIONS

SHEET NAME: TYPICAL SECTIONS	DRAWING NAME: GRAHAM HILL ROAD

BY	
REVISION	
DATE	

COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS

GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. – 0.61 MILES EAST

PROJECT ENGINEER: C. VESTER

DRAWN:	CIV
CHECKED:	SBW
DATE:	02/09
SCALE:	AS SHOWN
JOB NO.	40265
SHEET	4 OF

EXHIBIT A

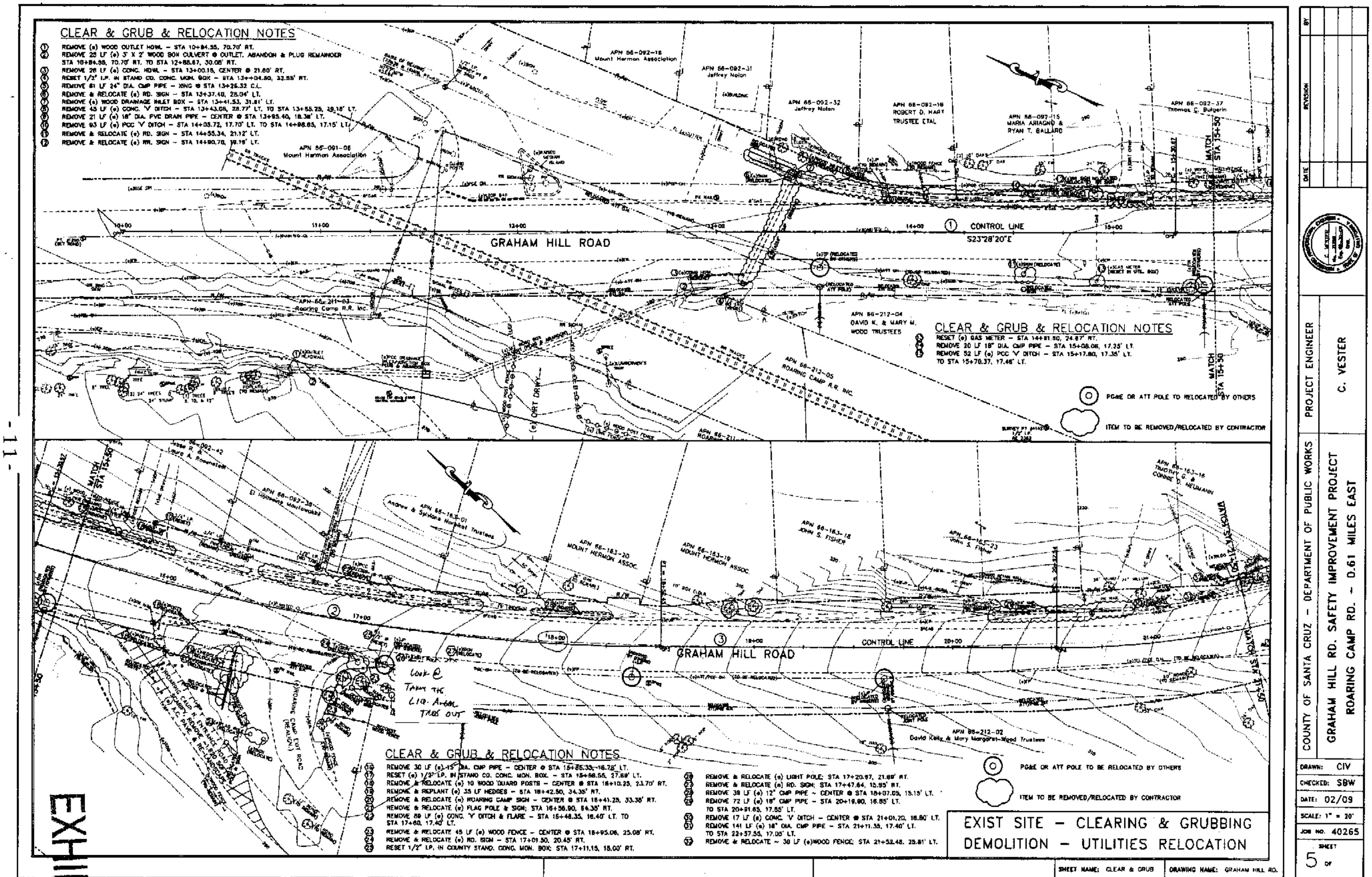
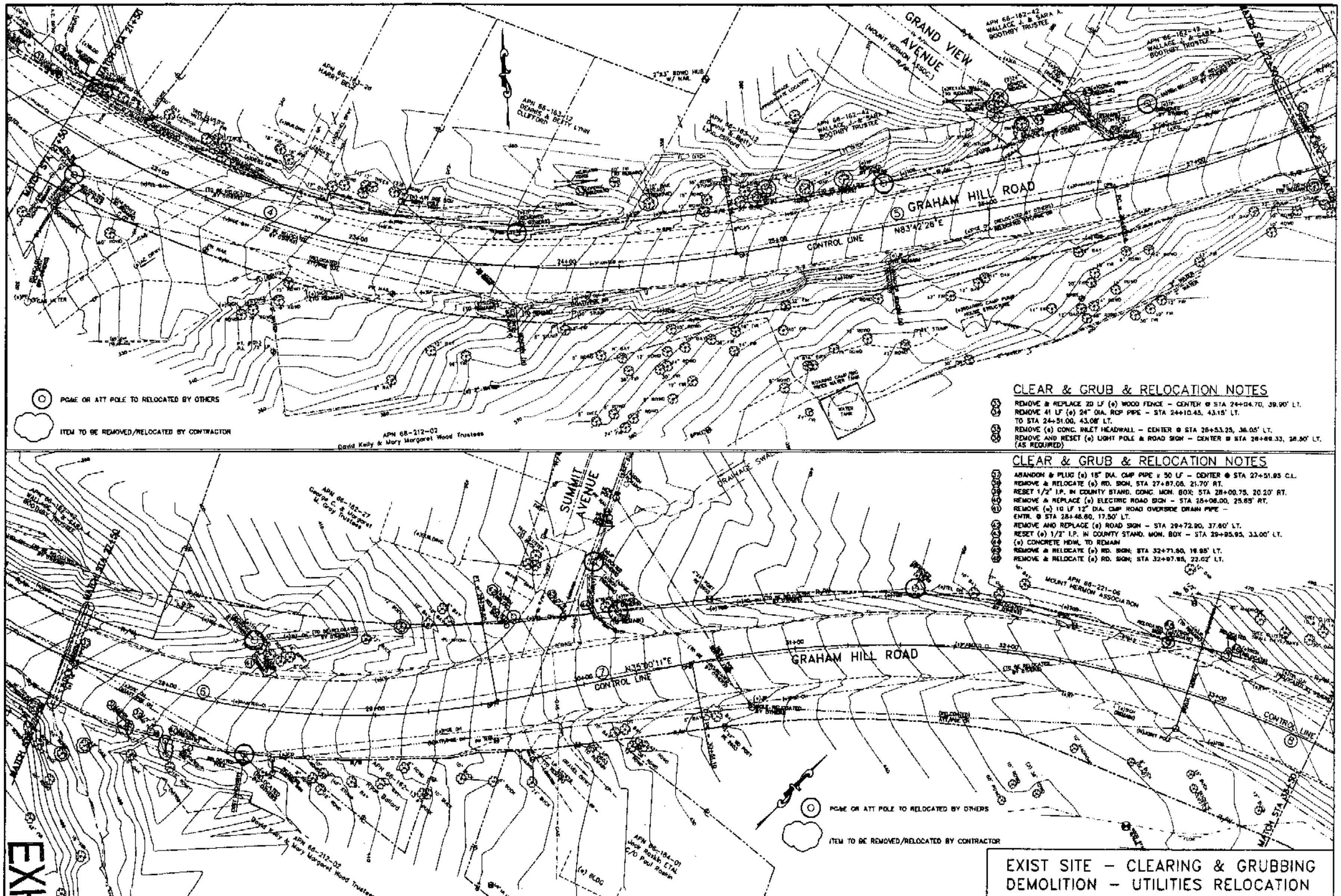

COUNTY OF SANTA CRUZ - DEPARTMENT OF PUBLIC WORKS
GRAHAM HILL RD. SAFETY IMPROVEMENT PROJECT
ROARING CAMP RD. - 0.61 MILES EAST
PROJECT ENGINEER
C. VESTER
DRAWN: CIV
CHECKED: SBW
DATE: 02/09
SCALE: 1" = 20'
JOB NO. 40265
SHEET 5 OF
DATE
REVISION
BY
CLEAR & GRUB & RELOCATION NOTES
1 REMOVE (e) WOOD OUTLET HDWL - STA 10+84.35, 70.70' RT.
2 REMOVE 25 LF (e) 3' X 2' WOOD BOX CULVERT @ OUTLET. ABANDON & PLUG REMAINDER STA 10+84.35, 70.70' RT. TO STA 12+85.67, 30.05' RT.
3 REMOVE 26 LF (e) CONC. HDWL - STA 13+00.15, CENTER @ 21.60' RT.
4 RESET 1/2" I.P. IN STAND CO. CONC. MON. BOX - STA 13++04.80, 32.55' RT.
5 REMOVE 81 LF 24" DIA. CMP PIPE - XING @ STA 13+26.32 C.L.
6 REMOVE & RELOCATE (e) RD. SIGN - STA 13+37.40, 28.04' LT.
7 REMOVE (e) WOOD DRAINAGE INLET BOX - STA 13+41.53, 31.81' LT.
8 REMOVE 45 LF (e) CONC. 'V' DITCH - STA 13+43.08, 28.77' LT. TO STA 13+85.25, 39.18' LT.
9 REMOVE 21 LF (e) 18" DIA. PVC DRAIN PIPE - CENTER @ STA 13+95.40, 18.38' LT.
10 REMOVE 93 LF (e) PCC 'V' DITCH - STA 14+05.72, 17.70' LT. TO STA 14+98.65, 17.15' LT.
11 REMOVE & RELOCATE (e) RD. SIGN - STA 14+55.34, 21.12' LT.
12 REMOVE & RELOCATE (e) RR. SIGN - STA 14+90.70, 19.19' LT.
APN 66-091-06 Mount Hermon Association
APN 66-092-18 Mount Hermon Association
APN 66-092-31 Jeffrey Nolan
APN 66-092-32 Jeffrey Nolan
APN 66-092-16 ROBERT D. HART TRUSTEE ETAL
APN 66-092-15 MARIA ARIAGNO & RYAN T. BALLARD
APN 66-092-37 Thomas C. Bulgerin
MATCH STA 15+50
CONTROL LINE S23°28'20"E
GRAHAM HILL ROAD
APN 66-211-03 Roaring Camp R.R. Inc.
APN 66-212-04 DAVID K. & MARY M. WOOD TRUSTEES
APN 66-212-05 ROARING CAMP R.R. INC.
CLEAR & GRUB & RELOCATION NOTES
13 RESET (e) GAS METER - STA 14+81.80, 24.87' RT.
14 REMOVE 20 LF 18" DIA. CMP PIPE - STA 15+08.08, 17.23' LT.
15 REMOVE 52 LF (e) PCC 'V' DITCH - STA 15+17.80, 17.35' LT. TO STA 15+70.37, 17.46' LT.
PG&E OR ATT POLE TO RELOCATED BY OTHERS
ITEM TO BE REMOVED/RELOCATED BY CONTRACTOR
APN 66-092-42 Jesse R. & Laura A. Rosenfeldt
APN 66-092-36 El Hjaareng Moulavakis
APN 66-163-01 Andrew & Sylvana Horabet Trustees
APN 66-163-20 MOUNT HERMON ASSOC.
APN 66-163-19 MOUNT HERMON ASSOC.
APN 66-163-18 JOHN S. FISHER
APN 66-163-23 John S. Fisher
APN 66-163-16 TIMOTHY G. & CONNIE D. NEUMANN
APN 66-212-02 David Kelly & Mary Margaret-Wood Trustees
GRAHAM HILL ROAD
CONTROL LINE
MATCH STA 21+50
(e)ROARING CAMP EXIT ROAD (REALIGN.)
Look @ Taking the Liq. Amber Trees out
CLEAR & GRUB & RELOCATION NOTES
16 REMOVE 30 LF (e) 15" DIA. CMP PIPE - CENTER @ STA 15+85.33, 16.78' LT.
17 RESET (e) 1/2" I.P. IN STAND CO. CONC. MON. BOX. - STA 15+88.55, 27.69' LT.
18 REMOVE & RELOCATE (e) 10 WOOD GUARD POSTS - CENTER @ STA 16+10.25, 23.70' RT.
19 REMOVE & REPLANT (e) 35 LF HEDGES - STA 16+42.50, 34.35' RT.
20 REMOVE & RELOCATE (e) ROARING CAMP SIGN - CENTER @ STA 16+41.25, 33.38' RT.
21 REMOVE & RELOCATE (e) FLAG POLE & SIGN; STA 16+56.90, 54.35' RT.
22 REMOVE 89 LF (e) CONC. 'V' DITCH & FLARE - STA 16+48.35, 16.40' LT. TO STA 17+60, 17.40' LT.
23 REMOVE & RELOCATE 45 LF (e) WOOD FENCE - CENTER @ STA 16+95.06, 25.08' RT.
24 REMOVE & RELOCATE (e) RD. SIGN - STA 17+01.50, 20.45' RT.
25 RESET 1/2" I.P. IN COUNTY STAND. CONC. MON. BOX: STA 17+11.15, 18.00' RT.
26 REMOVE & RELOCATE (e) LIGHT POLE; STA 17+20.67, 21.69' RT.
27 REMOVE & RELOCATE (e) RD. SIGN; STA 17+47.64, 15.95' RT.
28 REMOVE 39 LF (e) 12" CMP PIPE - CENTER @ STA 18+07.05, 15.15' LT.
29 REMOVE 72 LF (e) 18" CMP PIPE - STA 20+19.90, 16.85' LT. TO STA 20+91.65, 17.85' LT.
30 REMOVE 17 LF (e) CONC. 'V' DITCH - CENTER @ STA 21+01.20, 16.80' LT.
31 REMOVE 141 LF (e) 18" DIA. CMP PIPE - STA 21+71.35, 17.40' LT. TO STA 22+57.35, 17.05' LT.
32 REMOVE & RELOCATE ~ 30 LF (e)WOOD FENCE; STA 21+52.48, 25.81' LT.
PG&E OR ATT POLE TO BE RELOCATED BY OTHERS
ITEM TO BE REMOVED/RELOCATED BY CONTRACTOR
EXIST SITE - CLEARING & GRUBBING
DEMOLITION - UTILITIES RELOCATION
SHEET NAME: CLEAR & GRUB
DRAWING NAME: GRAHAM HILL RD.

EXHIBIT A



EXIST SITE – CLEARING & GRUBBING
DEMOLITION – UTILITIES RELOCATION

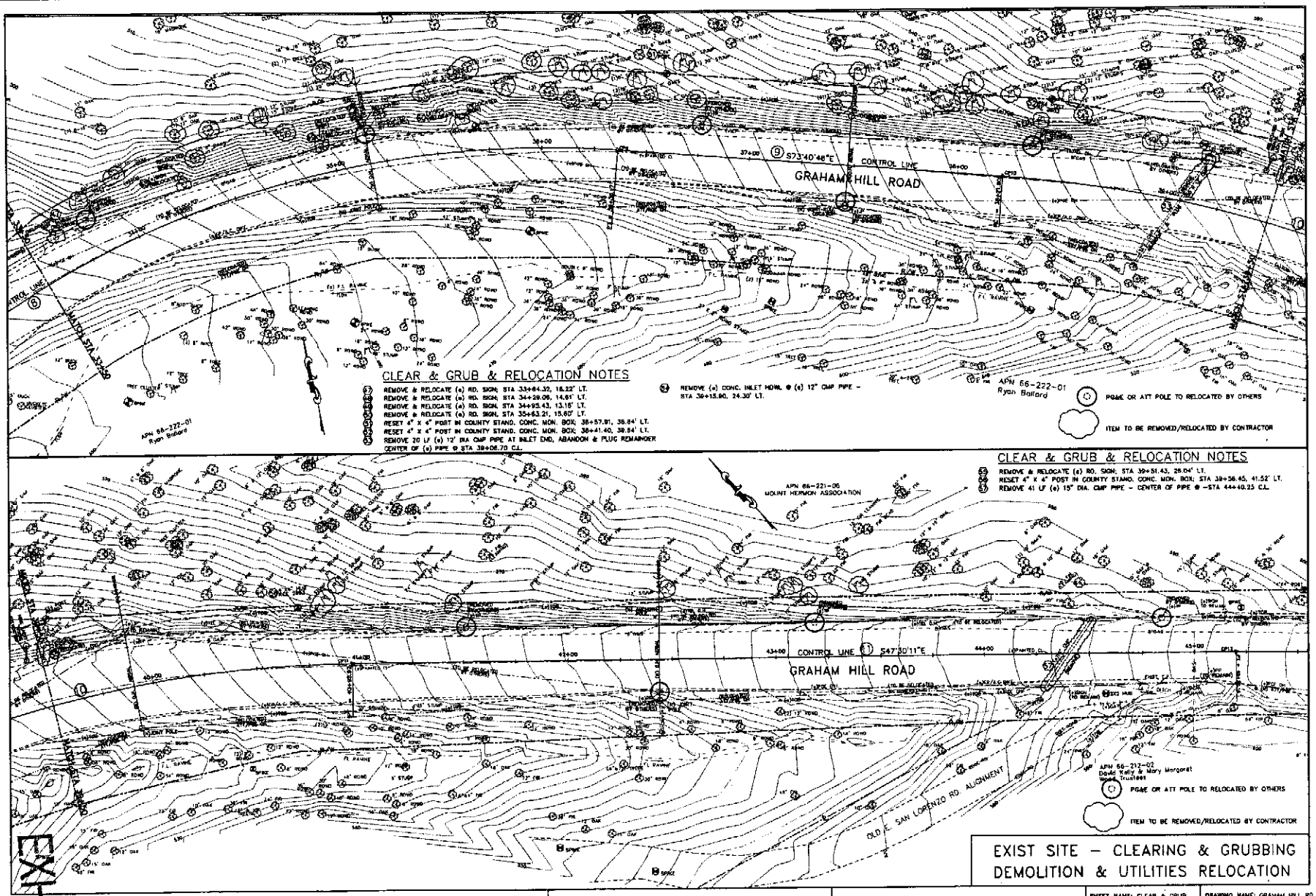
SHEET NAME: CLEAR & GRUB | DRAWING NAME: GRAHAM HILL RD.

COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS
GRAHAM HILL RD. SAFETY IMPROVEMENT PROJECT
ROARING CAMP RD. – 0.61 MILES EAST

PROJECT ENGINEER: C. VESTER

DRAWN: CIV
CHECKED: SBW
DATE: 02/09
SCALE: 1" = 20'
JOB NO. 40265
SHEET 6 OF

EXHIBIT A



BY | DATE | REVISION

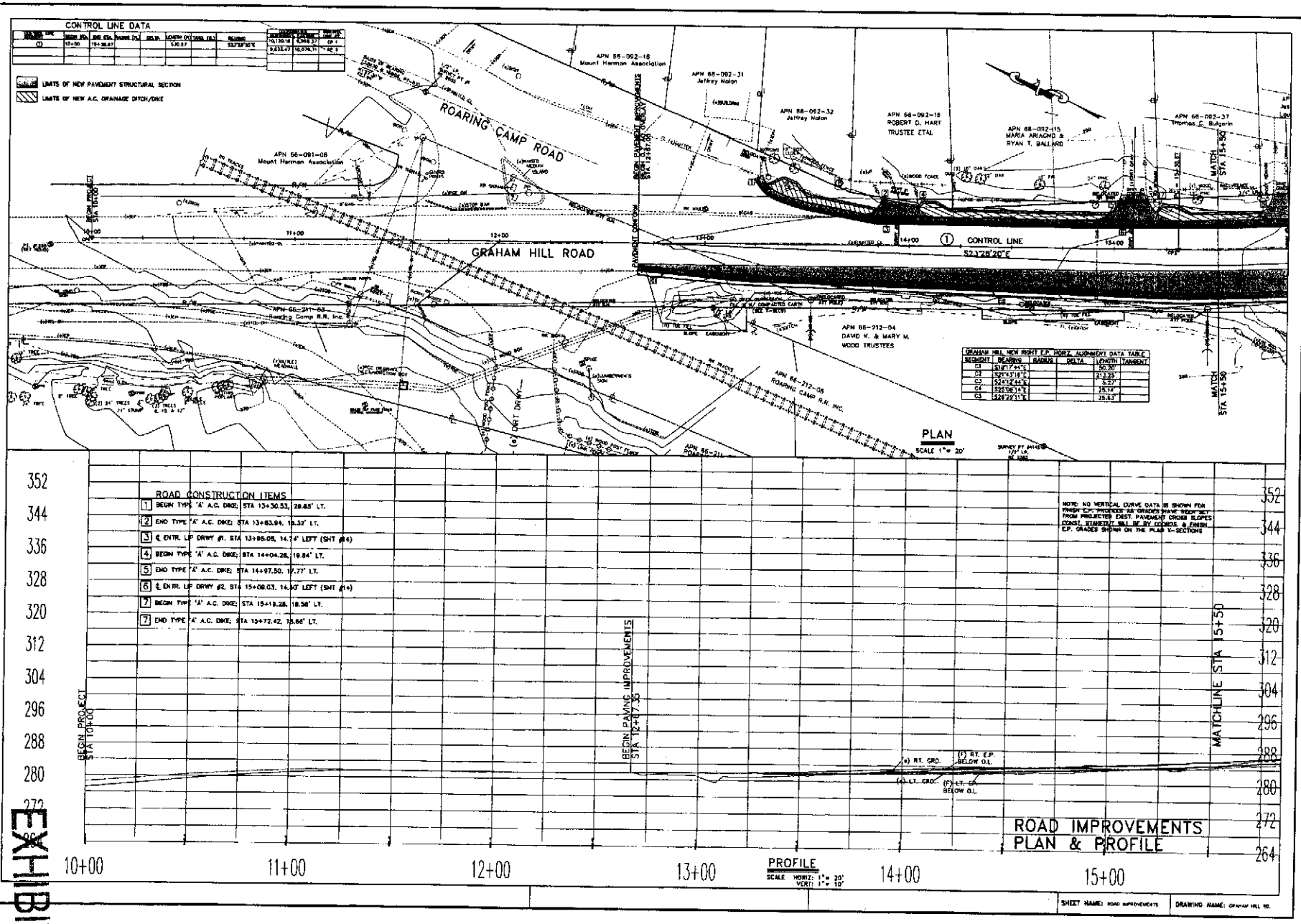
COUNTY OF SANTA CRUZ - DEPARTMENT OF PUBLIC WORKS

GRAHAM HILL RD. SAFETY IMPROVEMENT PROJECT
ROARING CAMP RD. - CLIMBING LANE

PROJECT ENGINEER: C. VESTER

DRAWN: CIV
CHECKED: SBW
DATE: 02/09
SCALE: 1" = 20'
JOB NO. 40265
SHEET 7 OF

EXHIBIT A



COUNTY OF SANTA CRUZ - DEPARTMENT OF PUBLIC WORKS

GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. - 0.61 MILES EAST

C. VESTER

DRAWN:	CIV
CHECKED:	SBW
DATE:	02/09
SCALE:	AS SHOWN
JOB NO.	40265
SHEET	8 OF

- 14 -

EXHIBIT A

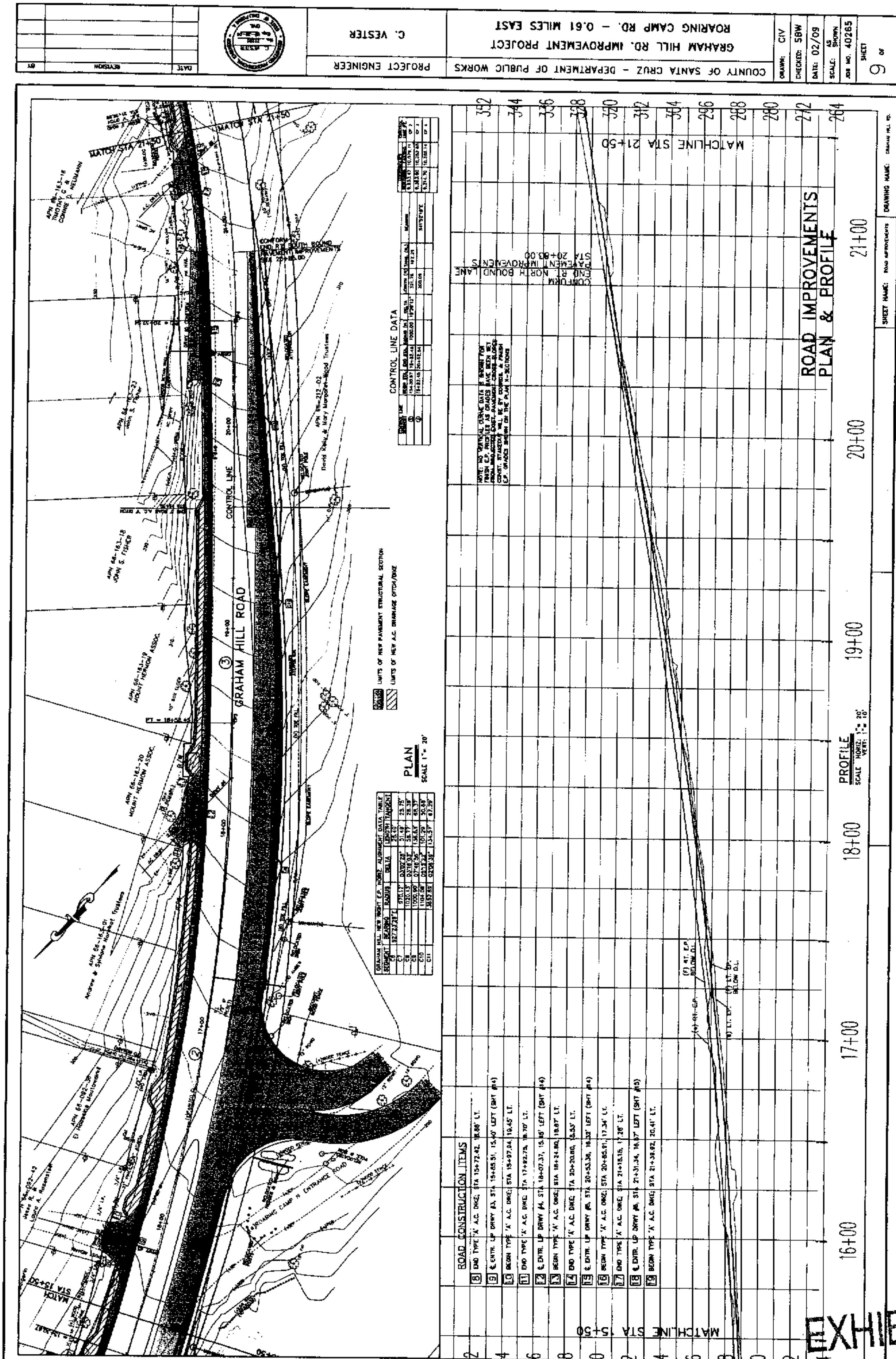
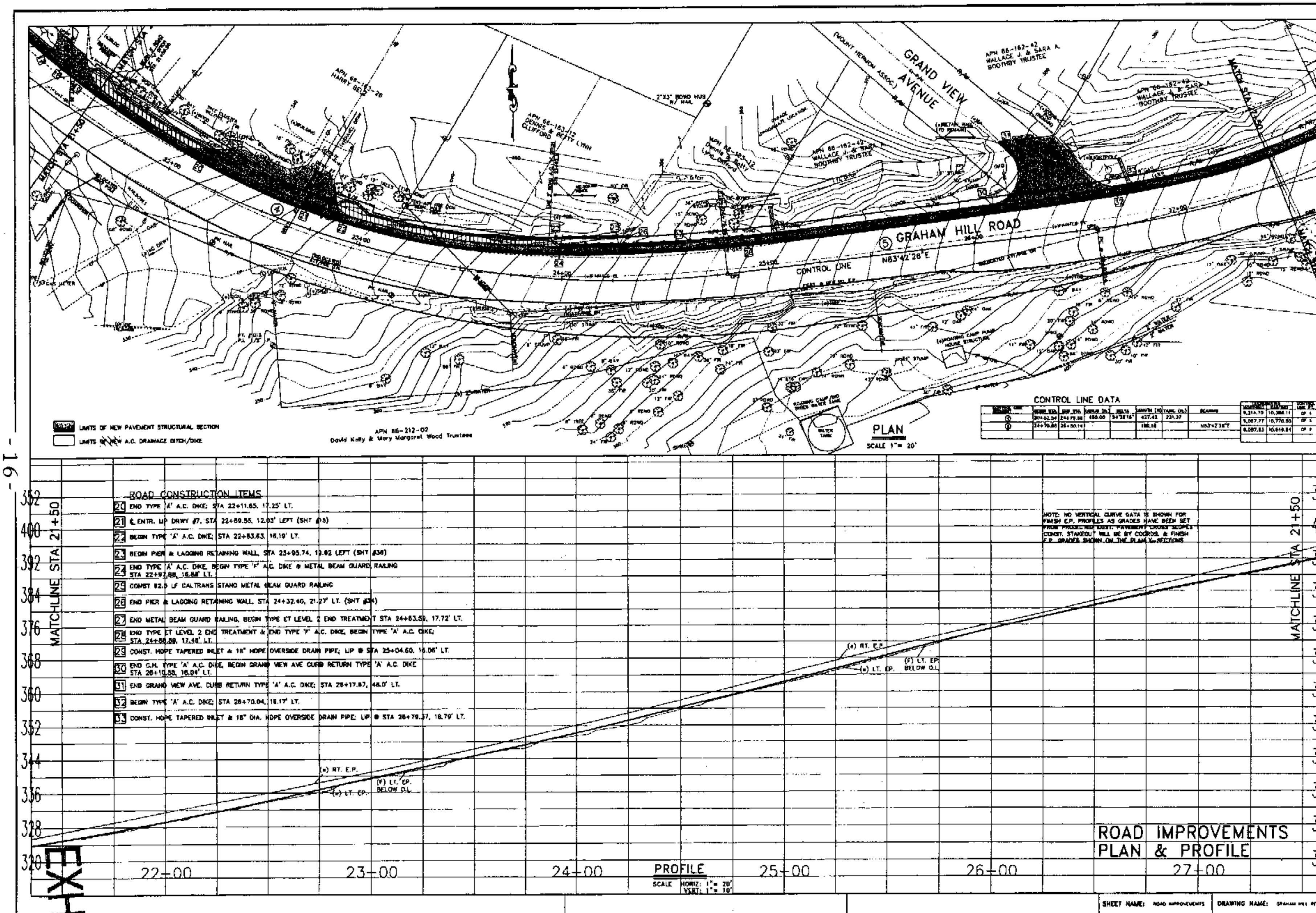

COUNTY OF SANTA CRUZ - DEPARTMENT OF PUBLIC WORKS
GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. - 0.61 MILES EAST
C. VESTER
PROJECT ENGINEER
ROAD IMPROVEMENTS
PLAN & PROFILE
MATCHLINE STA 21+50
MATCHLINE STA 15+50
GRAHAM HILL ROAD
CONTROL LINE
CONTROL LINE DATA
PLAN
PROFILE
ROAD CONSTRUCTION ITEMS
16+00
17+00
18+00
19+00
20+00
21+00

EXHIBIT A



DATE	REVISION	BY

PROJECT ENGINEER

C. VESTER

COUNTY OF SANTA CRUZ - DEPARTMENT OF PUBLIC WORKS

GRAHAM HILL RD. IMPROVEMENT PROJECT

ROARING CAMP RD. - 0.61 MILES EAST

DRAWN: CIV

CHECKED: SBW

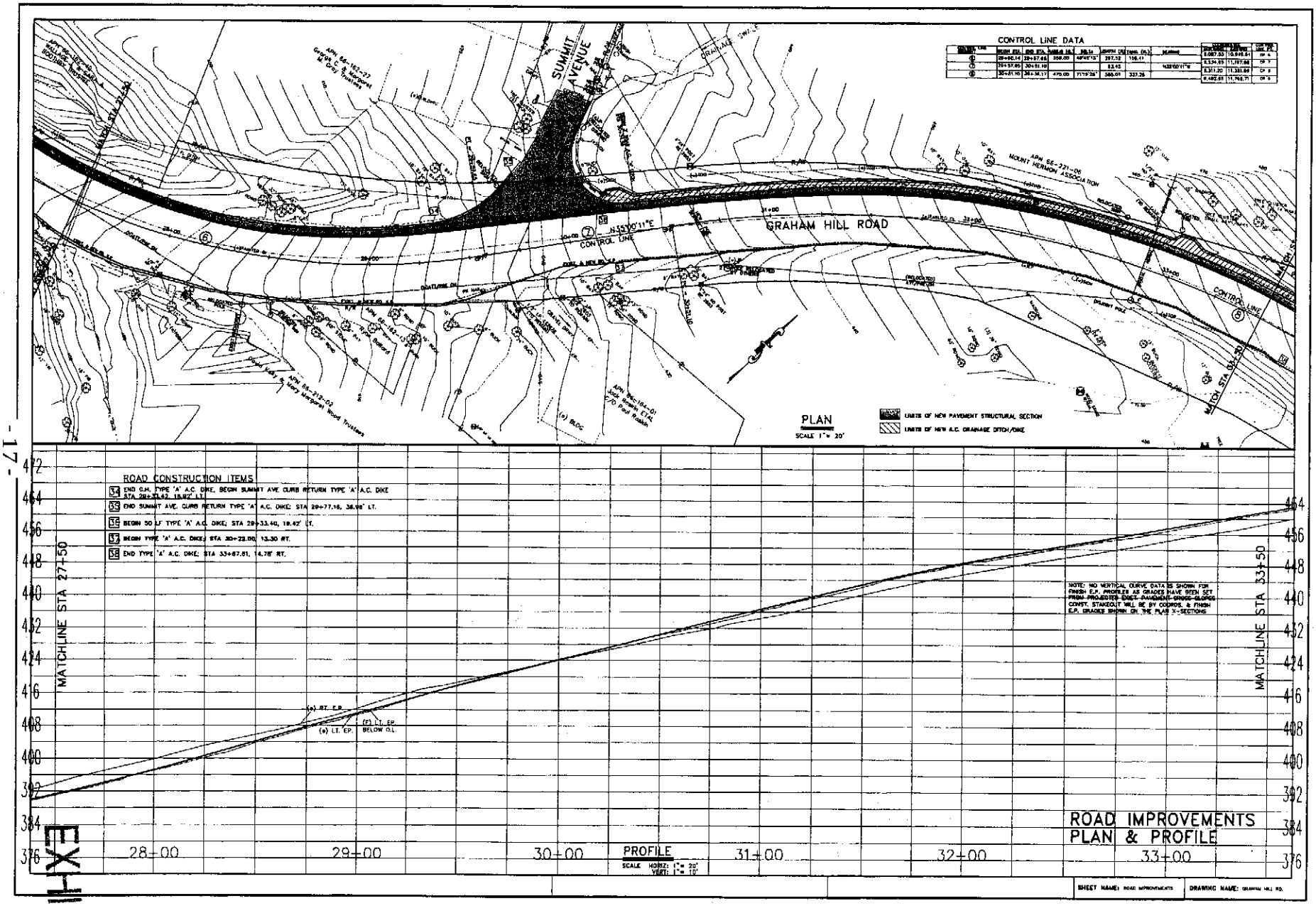
DATE: 02/09

SCALE: AS SHOWN

JOB NO. 40265

SHEET 10 OF

EXHIBIT A



COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS

GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. – 0.61 MILES EAST

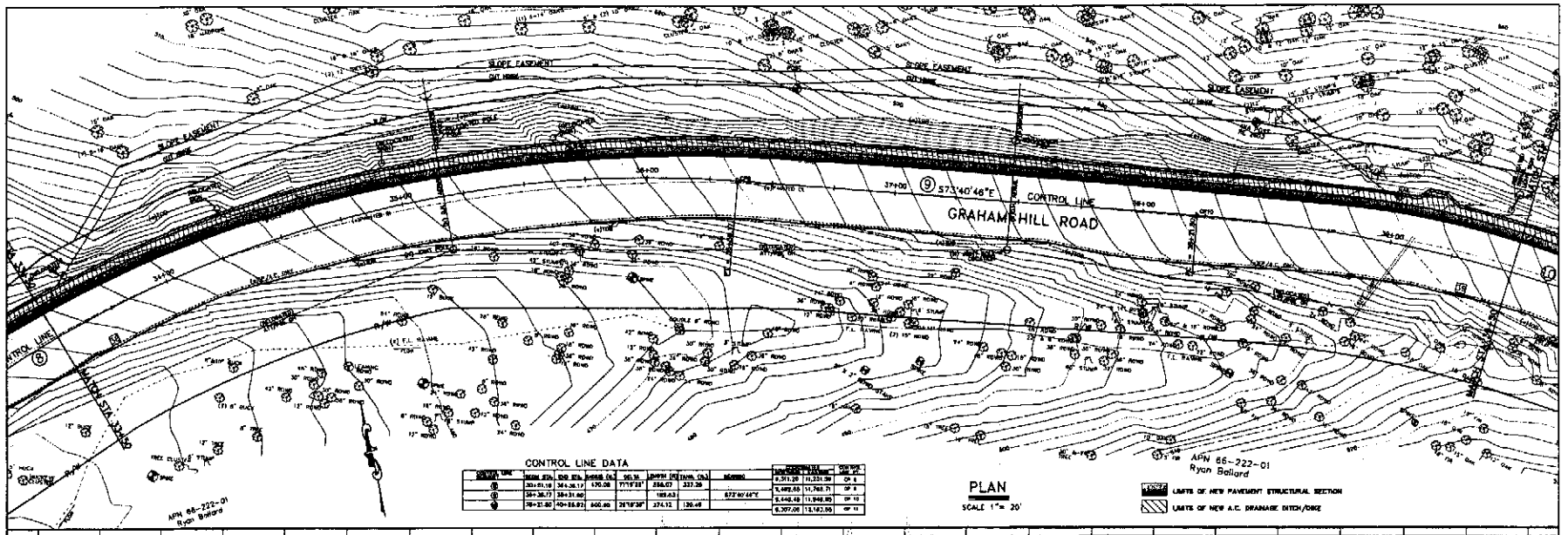
PROJECT ENGINEER: C. VESTER

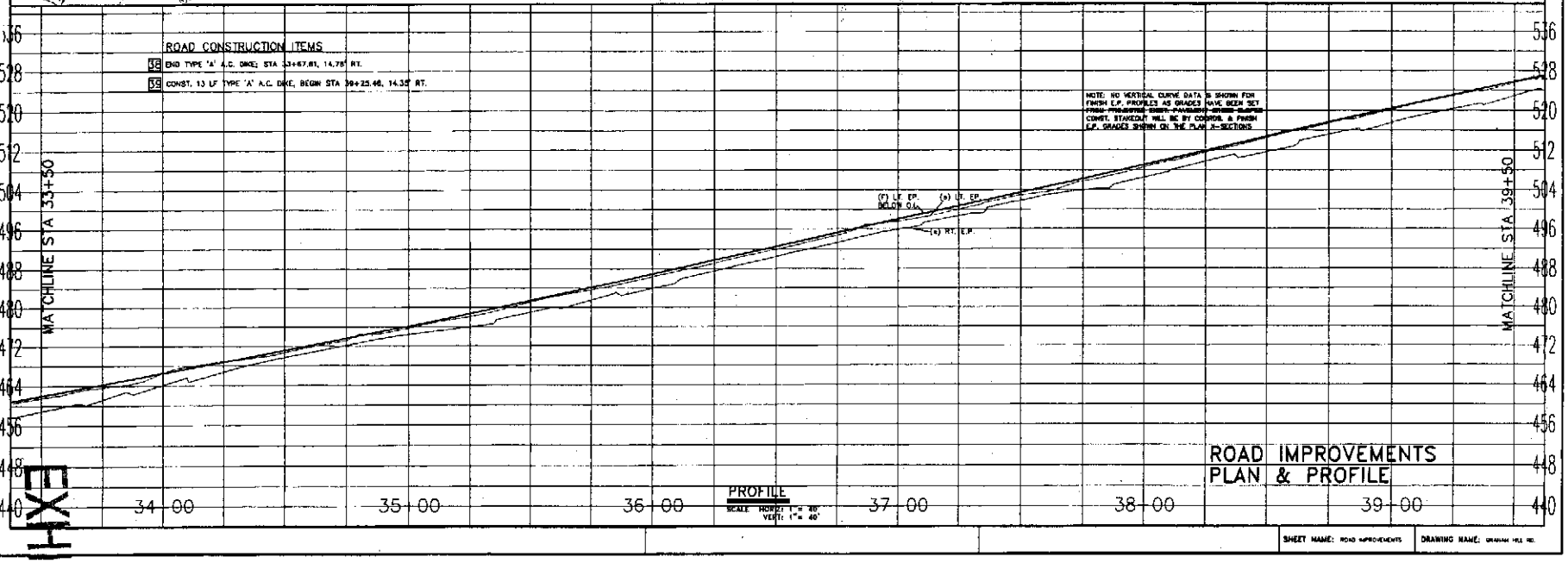
DRAWN: CIV
CHECKED: SBW
DATE: 02/09
SCALE: AS SHOWN
JOB NO. 40265
SHEET 11 OF

BY | REVISION | DATE

- 17 -

EXHIBIT A





ROAD IMPROVEMENTS
PLAN & PROFILE

SHEET NAME: ROAD IMPROVEMENTS | DRAWING NAME: GRAHAM HILL RD.

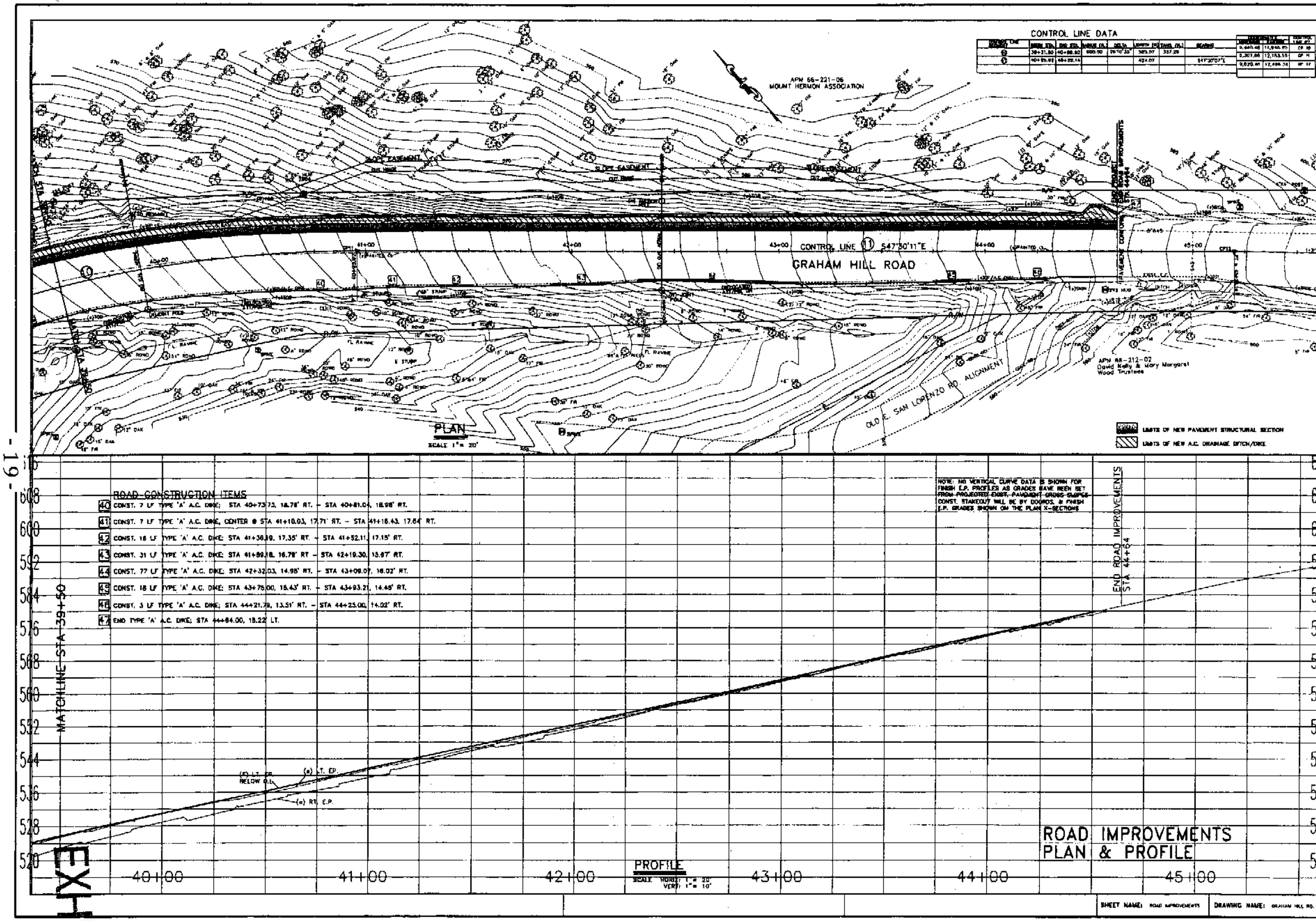
DRAWN:	CIV
CHECKED:	SBW
DATE:	02/09
SCALE:	AS SHOWN
JOB NO.	40265
SHEET	12 OF

COUNTY OF SANTA CRUZ - DEPARTMENT OF PUBLIC WORKS
GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. - 0.61 MILES EAST

PROJECT ENGINEER: C. VESTER

DATE | BY | REVISION

EXHIBIT A


CONTROL LINE DATA
APN 66-221-06
MOUNT HERMON ASSOCIATION
SLOPE EASEMENT
CONTROL LINE 11 S47°30'11"E
GRAHAM HILL ROAD
END ROAD IMPROVEMENTS STA 44+64
APN 68-212-02
David Kelly & Mary Margaret Wood Trustees
OLD E. SAN LORENZO RD. ALIGNMENT
PLAN
SCALE 1" = 20'
LIMITS OF NEW PAVEMENT STRUCTURAL SECTION
LIMITS OF NEW A.C. DRAINAGE DITCH/DIKE
ROAD CONSTRUCTION ITEMS
40 CONST. 7 LF TYPE 'A' A.C. DIKE; STA 40+73.73, 18.78' RT. - STA 40+81.04, 18.98' RT.
41 CONST. 7 LF TYPE 'A' A.C. DIKE, CENTER @ STA 41+10.03, 17.71' RT. - STA 41+16.43, 17.64' RT.
42 CONST. 16 LF TYPE 'A' A.C. DIKE: STA 41+36.89, 17.35' RT. - STA 41+52.11, 17.15' RT.
43 CONST. 31 LF TYPE 'A' A.C. DIKE; STA 41+89.18, 16.78' RT - STA 42+19.30, 15.67' RT.
44 CONST. 77 LF TYPE 'A' A.C. DIKE: STA 42+32.03, 14.95' RT. - STA 43+09.07, 16.02' RT.
45 CONST. 18 LF TYPE 'A' A.C. DIKE: STA 43+75.00, 15.43' RT. - STA 43+93.21, 14.45' RT.
46 CONST. 3 LF TYPE 'A' A.C. DIKE; STA 44+21.79, 13.51' RT. - STA 44+25.00, 14.02' RT.
47 END TYPE 'A' A.C. DIKE; STA 44+64.00, 18.22' LT.
NOTE: NO VERTICAL CURVE DATA IS SHOWN FOR FINISH E.P. PROFILES AS GRADES HAVE BEEN SET FROM PROJECTED EXIST. PAVEMENT CROSS SLOPES. CONST. STAKEOUT WILL BE BY DOGROS. & FINISH E.P. GRADES SHOWN ON THE PLAN X-SECTIONS
MATCHLINE STA 39+50
(e) LT. EP.
(e) RT. E.P.
PROFILE
SCALE HORIZ: 1" = 20'
VERT: 1" = 10'
616
608
600
592
584
576
568
560
552
544
536
528
520
40+00
41+00
42+00
43+00
44+00
45+00
ROAD IMPROVEMENTS
PLAN & PROFILE

PROJECT ENGINEER

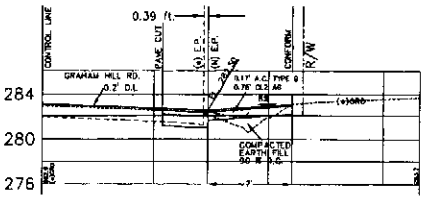
C. VESTER

COUNTY OF SANTA CRUZ - DEPARTMENT OF PUBLIC WORKS

GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. - 0.61 MILES EAST

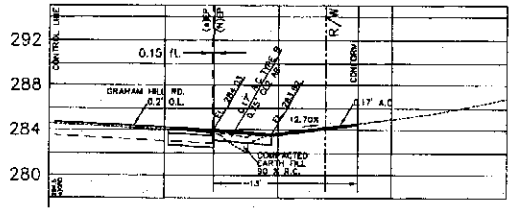
DRAWN: CIV
CHECKED: SBW
DATE: 02/09
SCALE: AS SHOWN
JOB NO. 40265
SHEET 13 of

EXHIBIT A



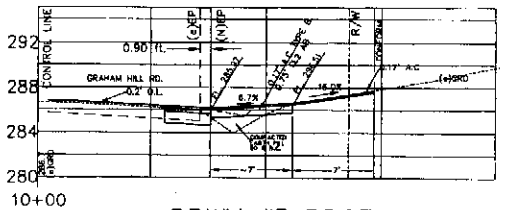
DRWY #1 PROFILE

SCALE: 1" = 5'



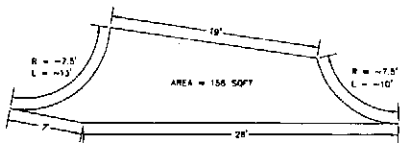
DRWY #2 PROFILE

SCALE: 1" = 5'



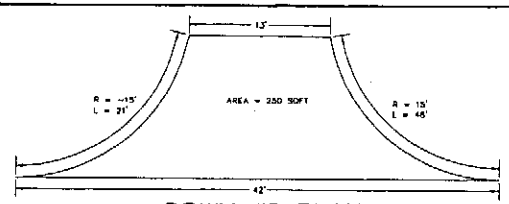
DRWY #3 PROFILE

SCALE: 1" = 5'



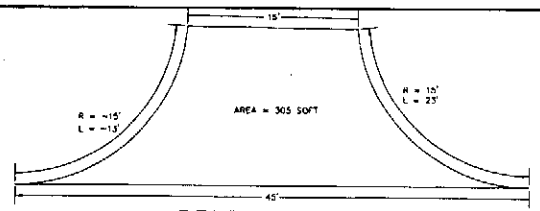
DRWY #1 PLAN

SCALE: 1" = 5'



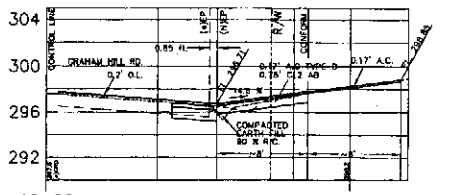
DRWY #2 PLAN

SCALE: 1" = 5'



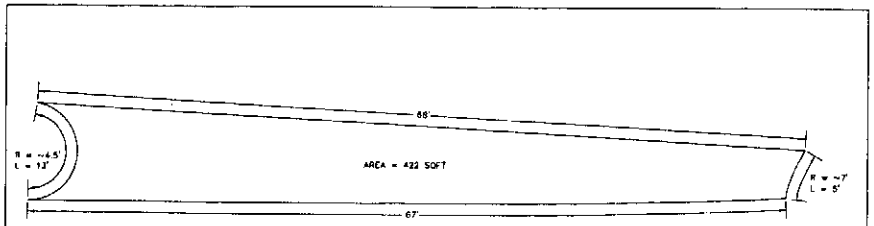
DRWY #3 PLAN

SCALE: 1" = 5'



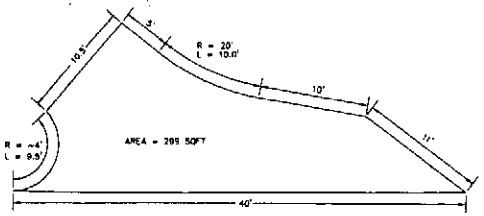
DRWY #4 PROFILE

SCALE: 1" = 5'



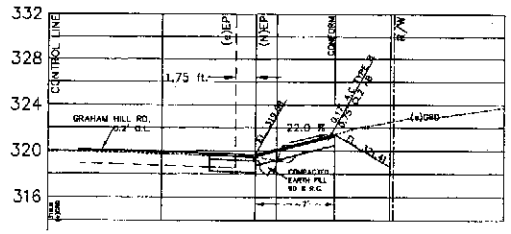
DRWY #5 PLAN PERPEND. DRWY C.L.

SCALE: 1" = 5'



DRWY #4 PLAN

SCALE: 1" = 5'



DRWY #5 PROFILE PERPEND. C.L. DRWY

SCALE: 1" = 5'

DRIVEWAY CONFORMS

SHEET NAME: DRIVEWAY CONFORMS | DRAWING NAME: GRAHAM HILL RD.

BY | REVISION | DATE

PROJECT ENGINEER: C. VESTER

COUNTY OF SANTA CRUZ - DEPARTMENT OF PUBLIC WORKS

GRAHAM HILL RD. IMPROVEMENT PROJECT

ROARING CAMP RD. - 0.61 MILES EAST

DRAWN: CIV

CHECKED: SBW

DATE: 02/09

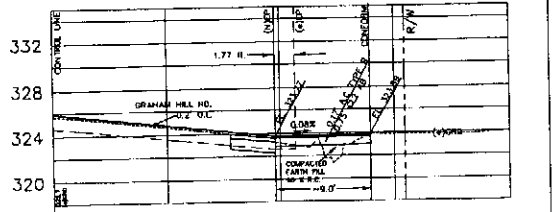
SCALE: AS SHOWN

JOB NO. 40265

SHEET 14 OF

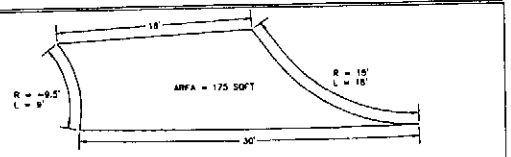
- 20 -

EXHIBIT A



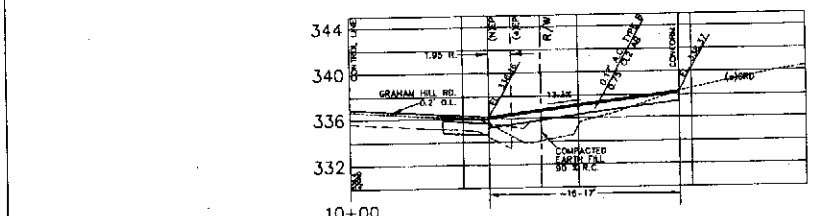
DRWY #6 PROFILE

SCALE: 1" = 5'



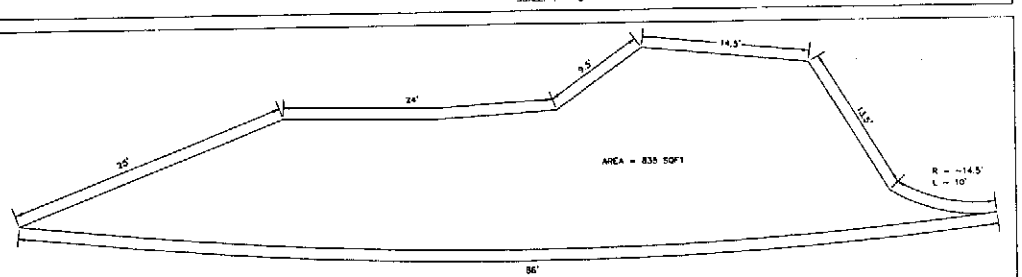
DRWY #6 PLAN

SCALE: 1" = 5'



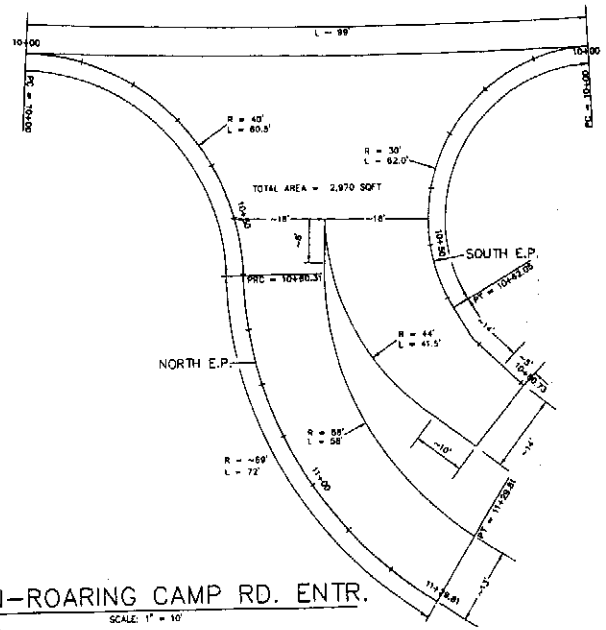
DRWY #7 PROFILE

SCALE: 1" = 5'



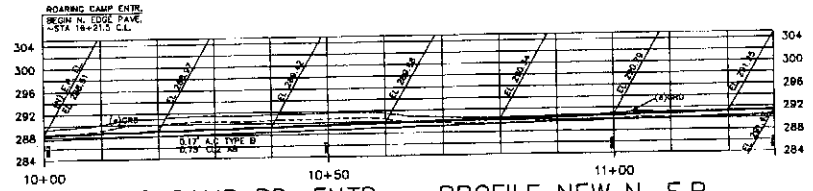
DRWY #7 PLAN

SCALE: 1" = 5'



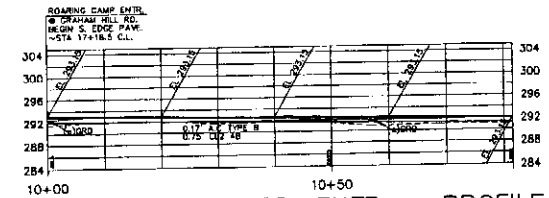
PLAN-ROARING CAMP RD. ENTR.

SCALE: 1" = 10'



ROARING CAMP RD. ENTR. - PROFILE NEW N. E.P.

SCALE: 1" = 10'



ROARING CAMP RD. ENTR. - PROFILE NEW S. E.P.

SCALE: 1" = 10'

DRIVEWAY CONFORMS

SHEET NAME: DRIVEWAY CONFORMS | DRAWING NAME: GRAHAM HILL RD.

BY | DATE | REVISION

PROJECT ENGINEER: C. VESTER

COUNTY OF SANTA CRUZ - DEPARTMENT OF PUBLIC WORKS

GRAHAM HILL RD. IMPROVEMENT PROJECT

ROARING CAMP RD. - 0.61 MILES EAST

DRAWN: CIV

CHECKED: SBW

DATE: 02/09

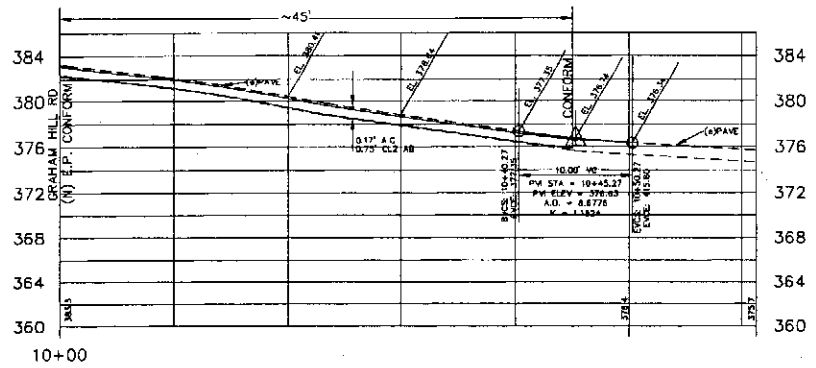
SCALE: AS SHOWN

JOB NO. 40265

SHEET 15 OF

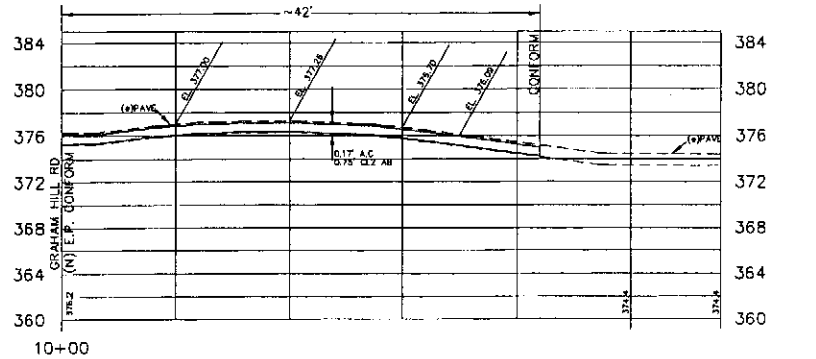
- 21 -

EXHIBIT A



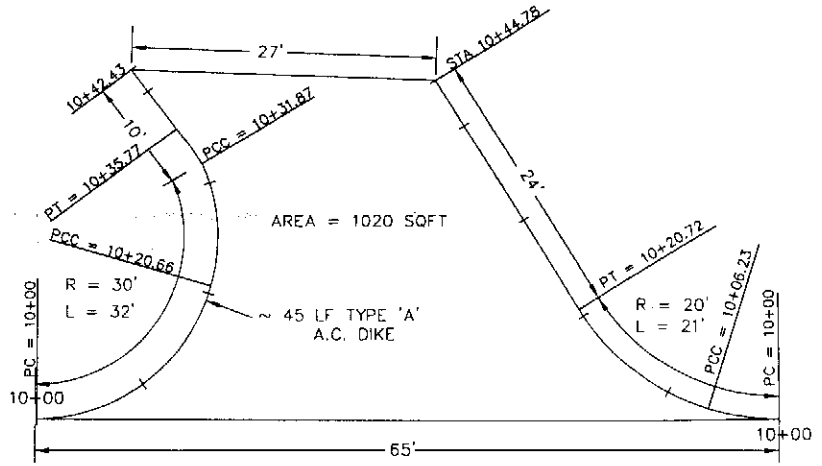
GRAND VIEW AVE. – PROFILE W CURB RETURN

SCALE: 1" = 5'



GRAND VIEW AVE. – PROFILE E CURB RETURN

SCALE: 1" = 5'



PLAN – GRAND VIEW AVE. APPROACH CONFORM

SCALE: 1" = 5'

GRAND VIEW AVE.
APPROACH PLAN & PROFILES

SHEET NAME: DRIVEWAY CONFORMS | DRAWING NAME: GRAHAM HILL RD

COUNTY OF SANTA CRUZ - DEPARTMENT OF PUBLIC WORKS

GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. - 0.61 MILES EAST

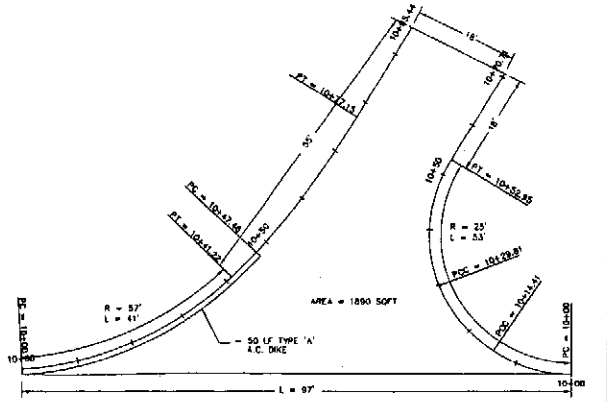
PROJECT ENGINEER: C. VESTER

BY	DATE	REVISION

DRAWN: CIV
CHECKED: SBW
DATE: 02/09
SCALE: AS SHOWN
JOB NO. 40265
SHEET 16 OF

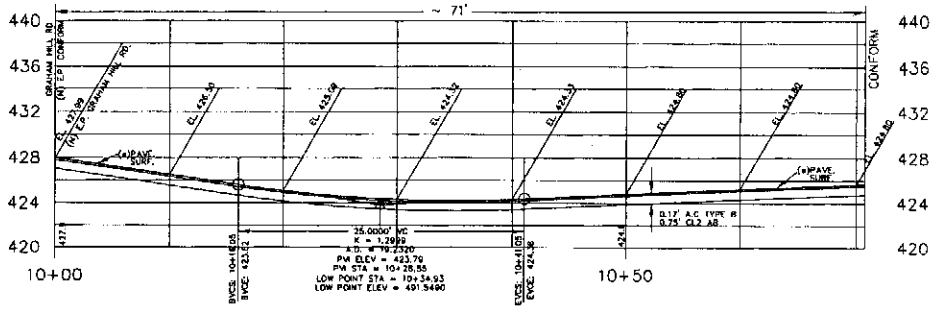
- 22 -

EXHIBIT A



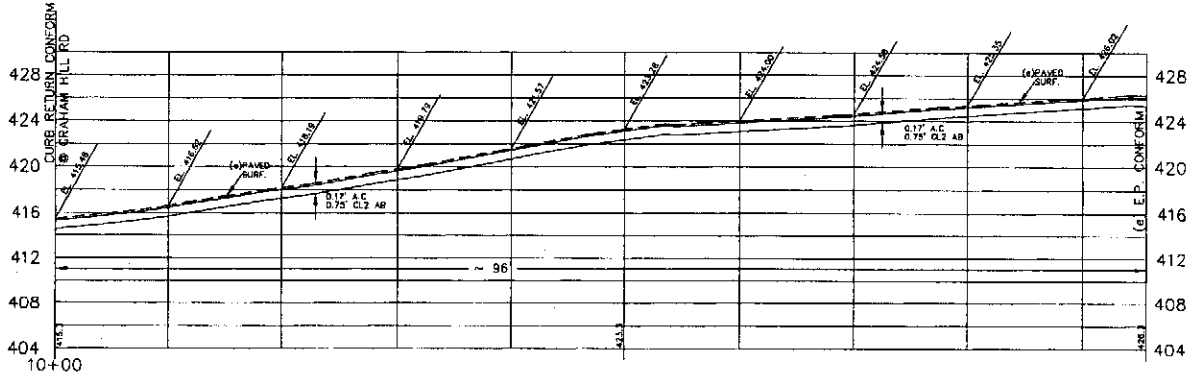
PLAN – SUMMIT AVE. APPROACH CONFORM

SCALE: 1" = 10'



SUMMIT AVE. – PROFILE NE CURB RETURN

SCALE: 1" = 5'



SUMMIT AVE. – PROFILE SW CURB RETURN

SCALE: 1" = 5'

SUMMIT AVE.
APPROACH PLAN & PROFILES

SHEET NAME: DRIVEWAY CONFORMS | DRAWING NAME: GRAHAM HILL RD.

COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS

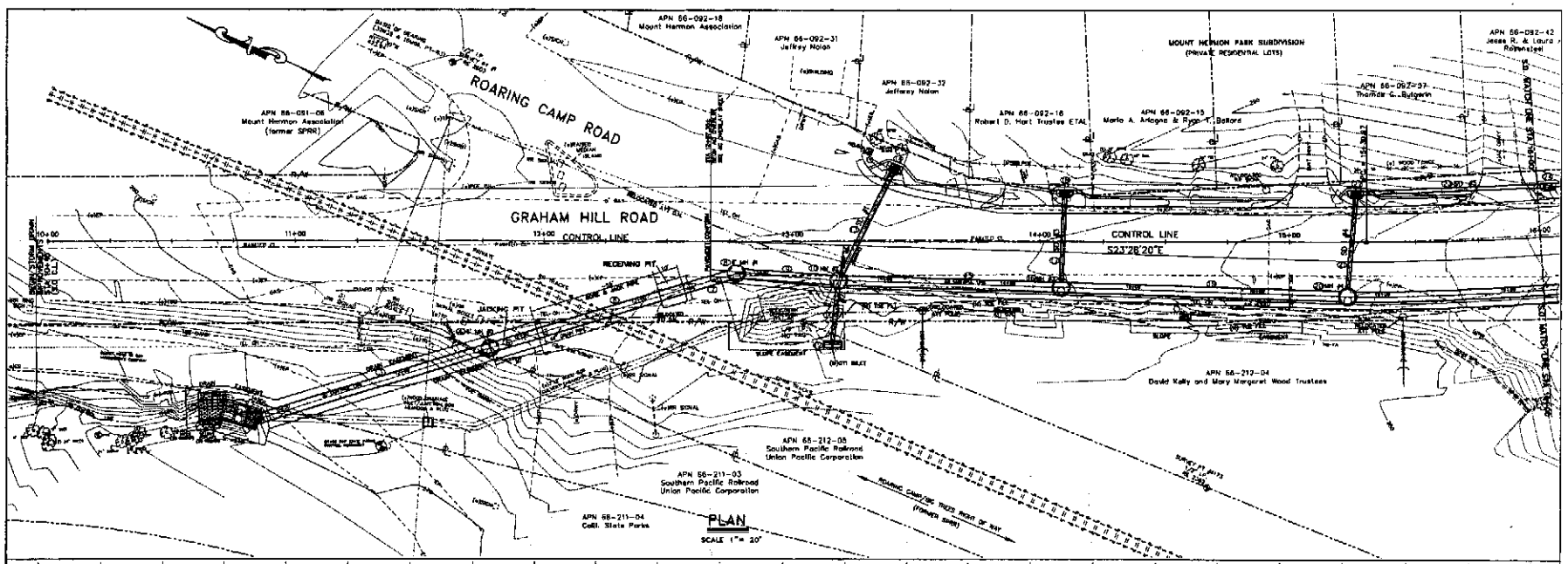
GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. – 0.61 MILES EAST

PROJECT ENGINEER: C. VESTER

DRAWN:	CIV
CHECKED:	SBW
DATE:	02/09
SCALE:	AS SHOWN
JOB NO.	40265
SHEET	17 OF

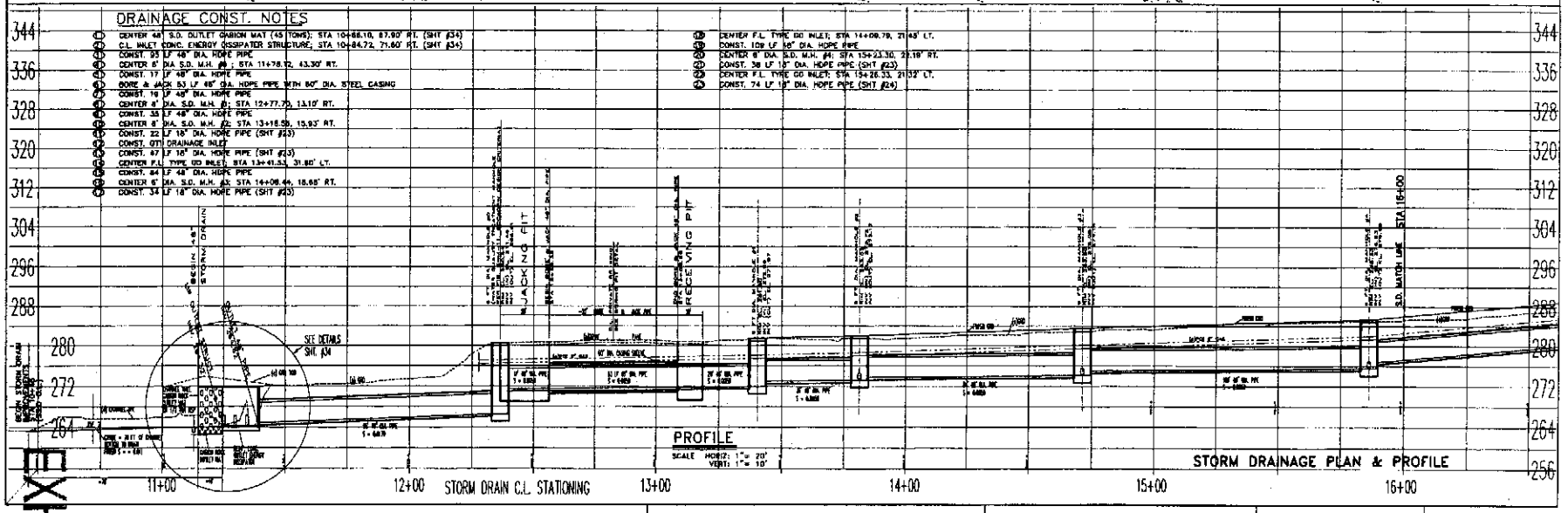
DATE | REVISION | BY

EXHIBIT A



DRAINAGE CONST. NOTES

1. CENTER 48" S.D. OUTLET GABION MAT (45 TONS); STA 10+66.10, 87.90' RT. (SHT #34)
2. C.I. INLET CONC. ENERGY DISSIPATER STRUCTURE; STA 10+84.72, 71.60' RT. (SHT #34)
3. CONST. 95 LF 48" DIA. HDPE PIPE
4. CENTER 8' DIA. S.D. M.H. #A ; STA 11+78.12, 43.30' RT.
5. CONST. 17 LF 48" DIA. HDPE PIPE
6. BORE & JACK 53 LF 66" DIA. HDPE PIPE WITH 60" DIA. STEEL CASING
7. CONST. 10 LF 48" DIA. HDPE PIPE
8. CENTER 6' DIA. S.D. M.H. #B; STA 12+77.70, 13.10' RT.
9. CONST. 55 LF 48" DIA. HDPE PIPE
10. CENTER 6' DIA. S.D. M.H. #C; STA 13+18.59, 15.93' RT.
11. CONST. 22 LF 18" DIA. HDPE PIPE (SHT #33)
12. CONST. QTY DRAINAGE INLET
13. CONST. 47 LF 18" DIA. HDPE PIPE (SHT #33)
14. CENTER F.L. TYPE GO INLET; STA 13+41.33, 31.80' LT.
15. CONST. 64 LF 48" DIA. HDPE PIPE
16. CENTER 6' DIA. S.D. M.H. #D; STA 14+08.44, 18.68' RT.
17. CONST. 34 LF 18" DIA. HDPE PIPE (SHT #33)
18. CENTER F.L. TYPE GO INLET; STA 14+09.79, 21.45' LT.
19. CONST. 109 LF 18" DIA. HDPE PIPE
20. CENTER 8' DIA. S.D. M.H. #E; STA 15+23.30, 23.19' RT.
21. CONST. 38 LF 12" DIA. HDPE PIPE (SHT #33)
22. CENTER F.L. TYPE GO INLET; STA 15+26.33, 21.32' LT.
23. CONST. 74 LF 12" DIA. HDPE PIPE (SHT #34)



STORM DRAINAGE PLAN & PROFILE

SHEET NAME: STORM DRAIN

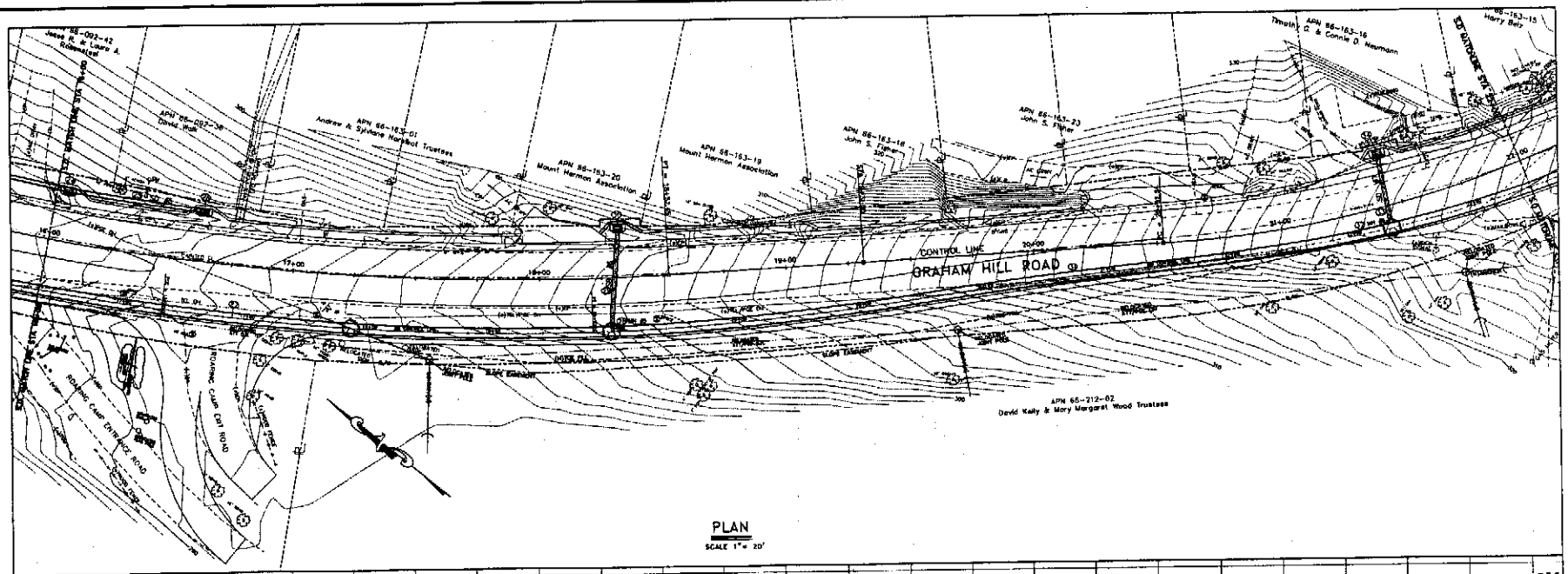
DRAWING NAME:

COUNTY OF SANTA CRUZ - DEPARTMENT OF PUBLIC WORKS	PROJECT ENGINEER: C. VESTER
GRAHAM HILL RD. IMPROVEMENT PROJECT ROARING CAMP RD. - 0.61 MILES EAST	
DRAWN: CIV	
CHECKED: SBW	
DATE: 02/09	
SCALE: AS SHOWN	
JOB NO. 40265	
SHEET 18 OF	

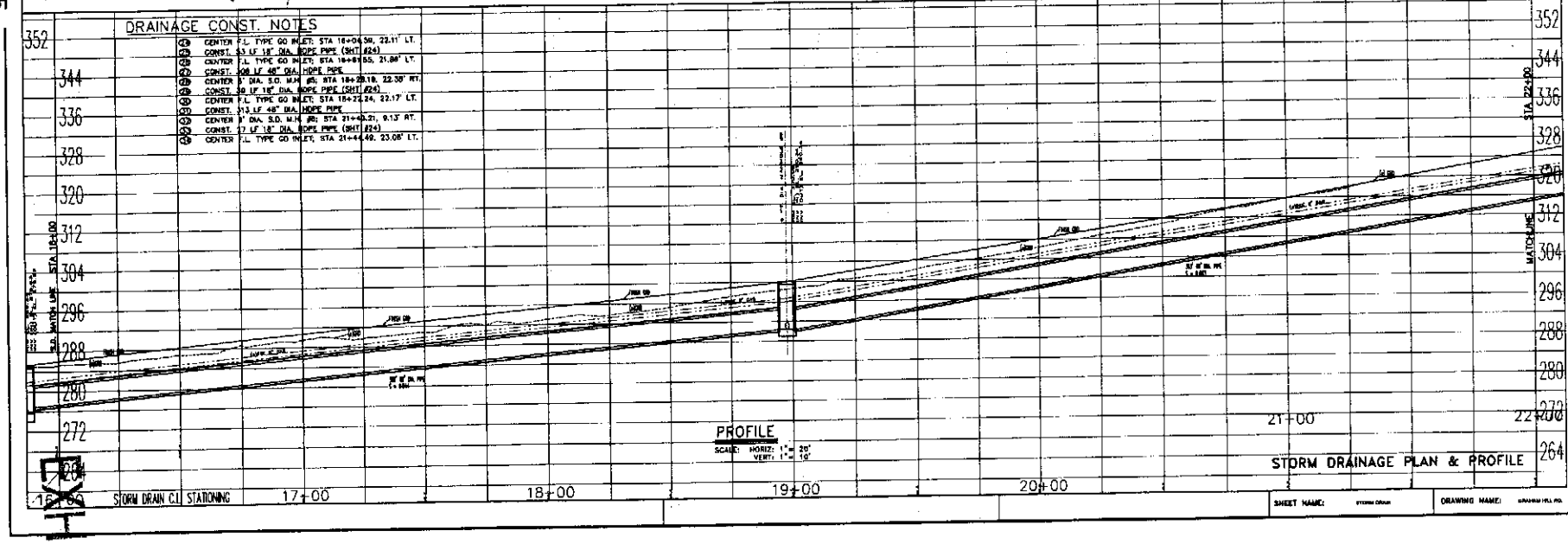
BY | DATE | REVISION

- 24 -

EXHIBIT A



PLAN
SCALE 1" = 20'



PROFILE
SCALE: HORIZ: 1" = 20'
VERT: 1" = 10'

STORM DRAINAGE PLAN & PROFILE

SHEET NAME: STORM DRAIN
DRAWING NAME: GRAHAM HILL RD.

BY	DATE	REVISION

PROJECT ENGINEER
C. VESTER

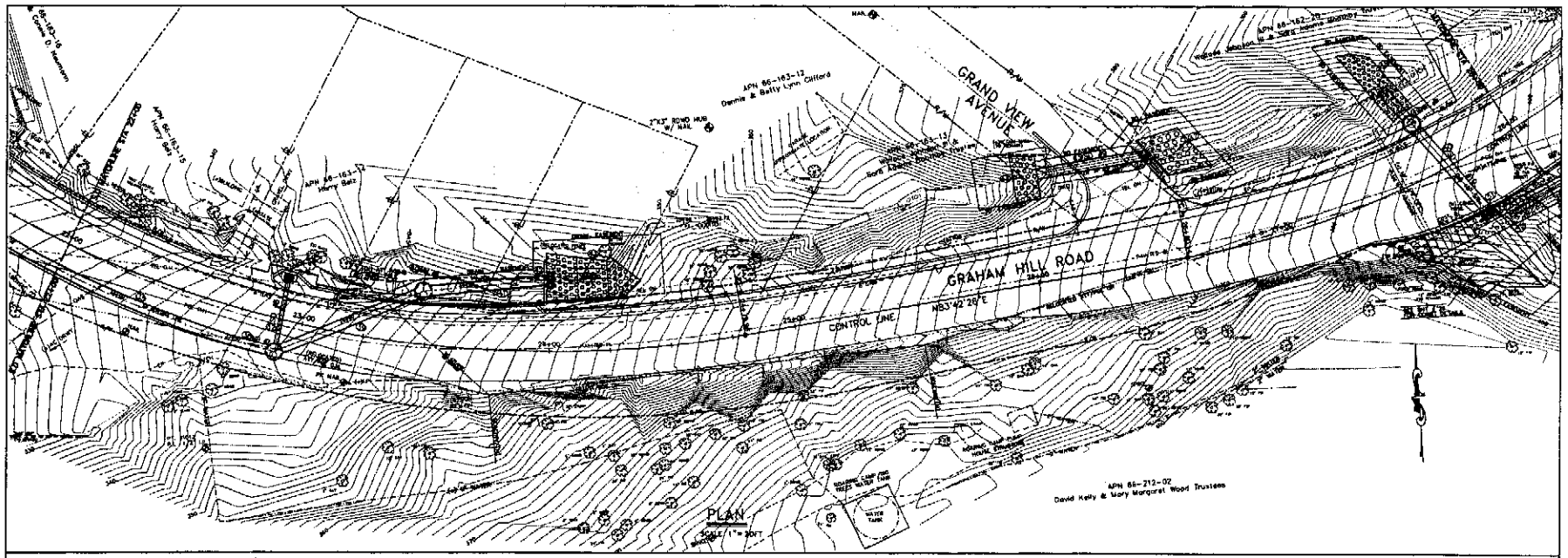
COUNTY OF SANTA CRUZ - DEPARTMENT OF PUBLIC WORKS

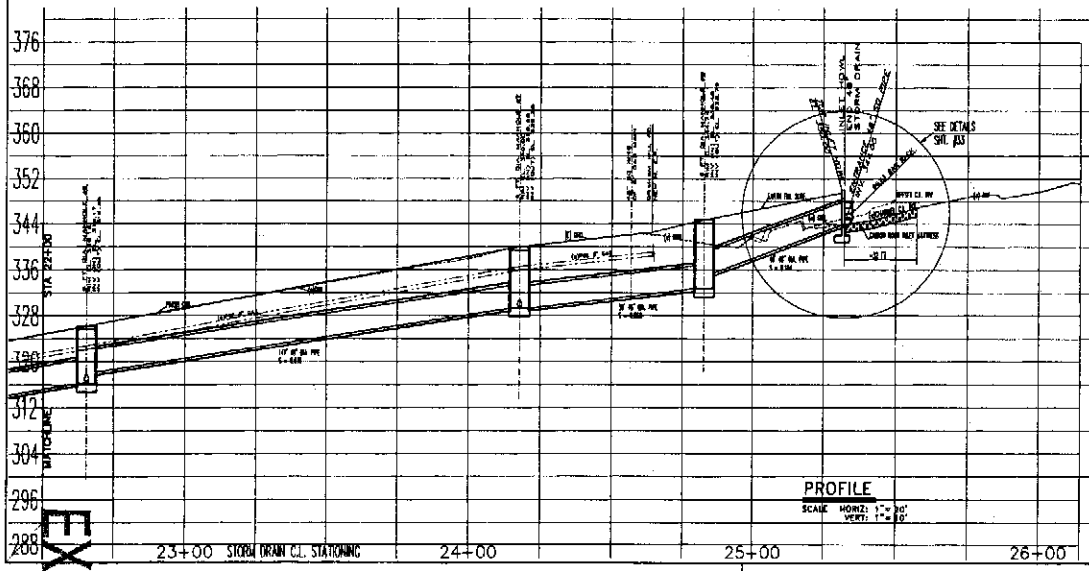
GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. - 0.61 MILES EAST

DRAWN:	CIV
CHECKED:	SBW
DATE:	02/09
SCALE:	AS SHOWN
JOB NO.	40265
SHEET	19 OF

- 25 -

EXHIBIT A





DRAINAGE CONST. NOTES

(16) CONST. 147 LF 48" DIA. HDPE PIPE
(17) CENTER 6' DIA. S.D. M.H. #7 – STA 22+91.61, 13.54' RT.
(18) CONST. 27 LF 18" DIA. HDPE PIPE (SHT #24)
(19) CENTER F.I. TYPE DD INLET – STA 22+89.66, 18.71' LT.
(20) CONST. 59 LF 48" DIA. HDPE PIPE
(21) CENTER 6' DIA. S.D. M.H. #8 – STA 23+46.72, 21.48' RT.
(22) CONST. 46 LF 48" DIA. HDPE PIPE
(23) CENTER 48" DIA. PIPE CONC. INLET HDWL. – STA 23+98.85, 28.93' LT. (SHT #25,36&37)
(24) 48" DIA. PIPE INLET GABION MAT (90 TONS) – STA 23+88.65 TO STA 24+33.38 CENTER AT APPROX. 29.10 LT. (SHT #33)
(25) CENTER OUTLET GABION MAT (35 TONS) AT 48" DIA. CROSS CULV. GRAND VIEW AVE. – STA 28+01.70, 42.32 LT. (SHT #25)
(26) CONST. 46 LF 48" DIA. HDPE PIPE, GRAND VIEW AVE. (SHT #25)
(27) CONST. 48" DIA. PIPE CONC. INLET HDWL. CENTER @ 26+52.64 – 43.00 LT. (SHT #25)
(28) CONST. INLET GABION MAT (70 TONS) AT 48" DIA. PIPE, GRAND VIEW AVE. CENTER @ STA 28+82.86, 41.85' LT. (SHT #25)
(29) CONST. OUTLET GABION MAT (58 TONS) AT 48" DIA. PIPE, GRAHAM HILL RD. X-CULV. CENTER @ APPROX. STA 27+61, 39.33' LT. (SHTS #26 & 27)
(30) CENTER 6' DIA. S.D. M.H. #9 STA 27+63.83, 21.85' LT.
(31) CONST. 44 LF 48" DIA. HDPE PIPE, GRAHAM HILL RD. XING – CENTER @ APPROX. STA 27+71.26 CL. SHTS #26 & 27)
(32) CENTER 48" DIA. PIPE CONC. INLET HDWL @ GRAHAM HILL RD X-CULV – STA 27+76.15 RT (SHT #28/27)
(33) GRADE – 40 LF UPSTREAM EARTH DRAINAGE CHANNEL AND CONST. INLET GABION MAT (40 TONS) AT ENTRANCE 48" DIA X-CULV. CENTER MAT @ STA 27+80.77, 27.42' RT. (SHTS #28, 27 28)
(34) CONST. 47 LF 30" DIA. HDPE PIPE, GRAHAM HILL RD. W. ROADSIDE DRAINAGE CHANNEL (SHT 28)

STORM DRAINAGE PLAN & PROFILE

SHEET NAME: STORM DRAIN
DRAWING NAME:

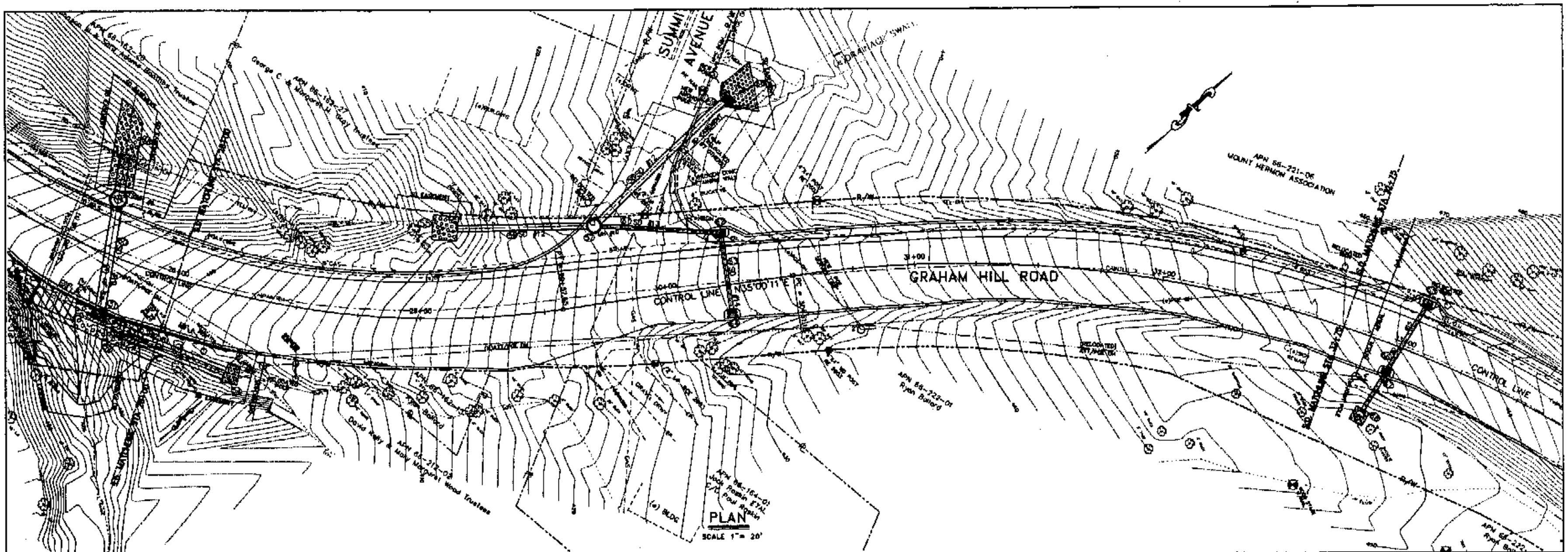
BY	
REVISION	
DATE	

PROJECT ENGINEER
C. VESTER

COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS
GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. – 0.61 MILES EAST

DRAWN:	CIV
CHECKED:	SBW
DATE:	02/09
SCALE:	AS SHOWN
JOB NO.	40265
SHEET	20 OF

EXHIBIT A



DRAINAGE CONST. NOTES

(54) CONST GABION INLET MAT (15 TONS) AT ENTRANCE 30" DIA. PIPE – STA 29+28.65, 31.05' RT. (SHT #28)
(55) CONST. GABION OUTLET MAT (20 TONS) AT OUTLET 30" DIA. PIPE, SUMMIT AVE. – STA 29+10.08, 38.33' LT. (SHT #28)
(56) CONST. 87 LF 30" DIA. HDPE PIPE (SEE SHT #29)
(57) CENTER 8' DIA. S.D. M.H. #10 – STA 29+74.85, 31.35' LT.
(58) CONST. 71 LF 30" DIA. HDPE PIPE (SHT #29)
(59) CONST 30" DIA. PIPE CONC. INLET HDW. – CENTER @ STA 30+34.42, 74.00' LT. (SHT #29)
(60) CONST. GABION INLET MAT (45 TONS) AT ENTRANCE 30" PIPE – CENTER @ STA 30+40.52, LT. (SHT #28)
(61) CONST. 48 LF 18" DIA. HDPE PIPE (SHT #30)
(62) CENTER F.L. TYPE GO INLET – STA 30+25.15, 22.58' LT.
(63) CONST. 32 LF 18" DIA. HDPE PIPE (SHT #30)
(64) CENTER F.L. TYPE GO INLET – STA 30+24.90, 13.15' RT.

STORM DRAINAGE PLAN

SHEET NAME: STORM DRAIN DRAWING NAME: GRAHAM HILL RD

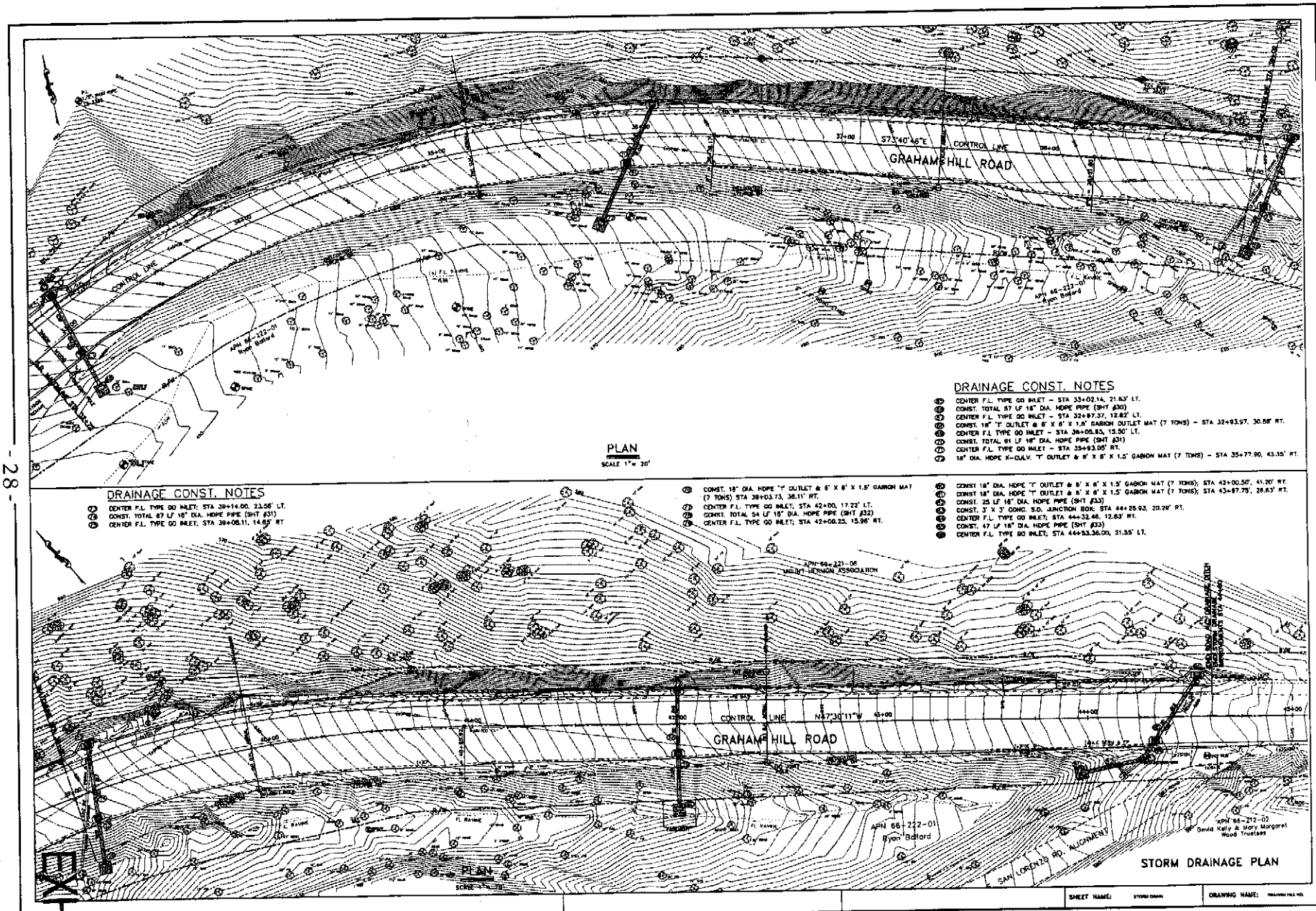
DATE	REVISION	BY

PROJECT ENGINEER: C. VESTER

COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS
GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. – 0.61 MILES EAST

DRAWN:	CIV
CHECKED:	SBW
DATE:	02/09
SCALE:	AS SHOWN
JOB NO.	40265
SHEET	21 OF

EXHIBIT A



BY | REVISION | DATE

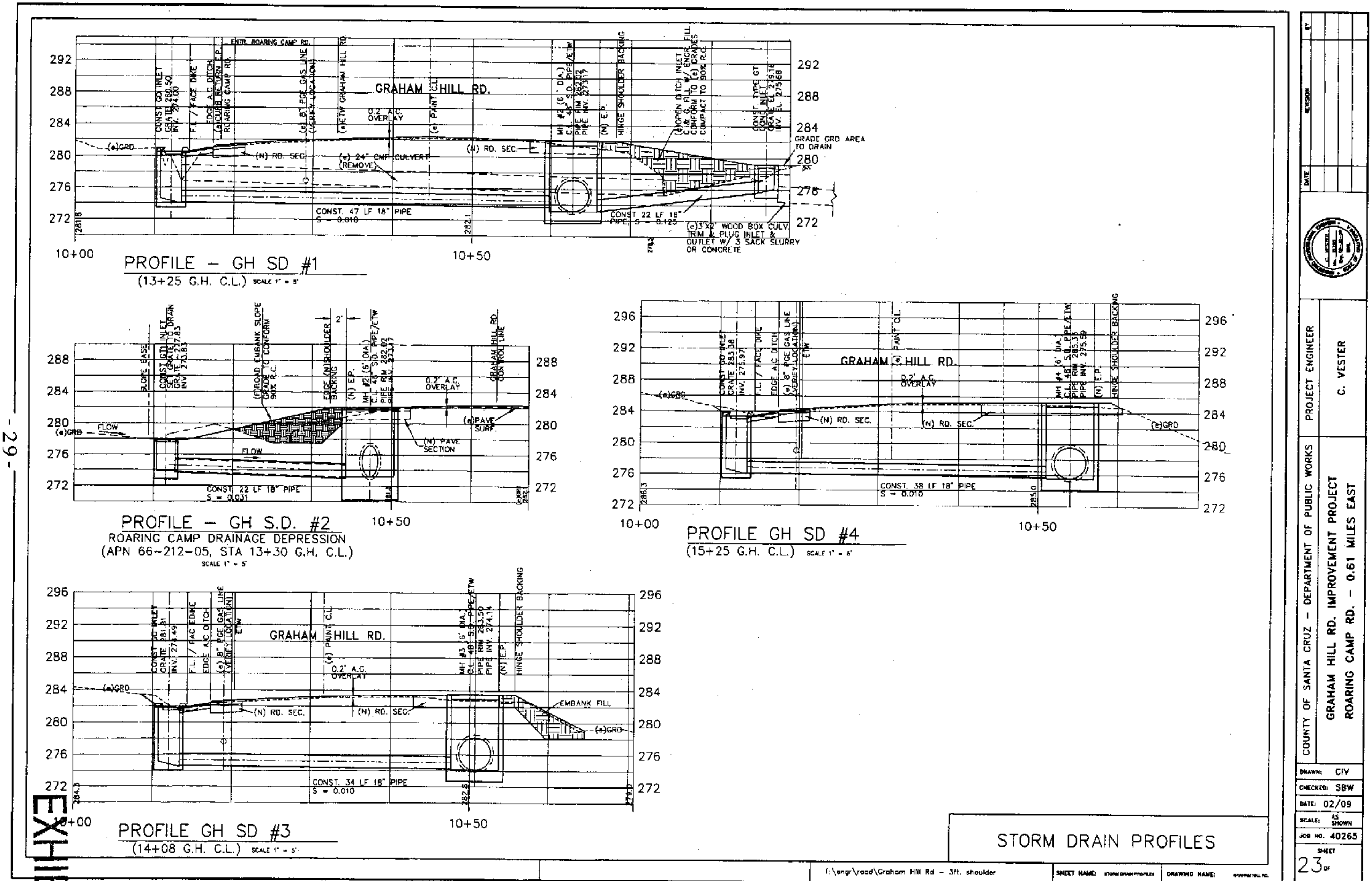
PROJECT ENGINEER
C. VESTER

COUNTY OF SANTA CRUZ - DEPARTMENT OF PUBLIC WORKS
GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. - 0.61 MILES EAST

DRAWN: CIV
CHECKED: SBW
DATE: 02/09
SCALE: AS SHOWN
JOB NO.: 40265
SHEET 22 OF

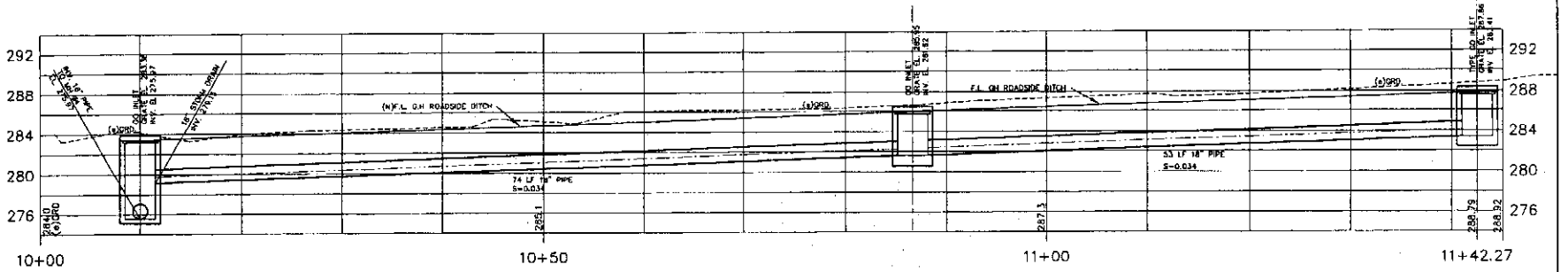
- 28 -

EXHIBIT A

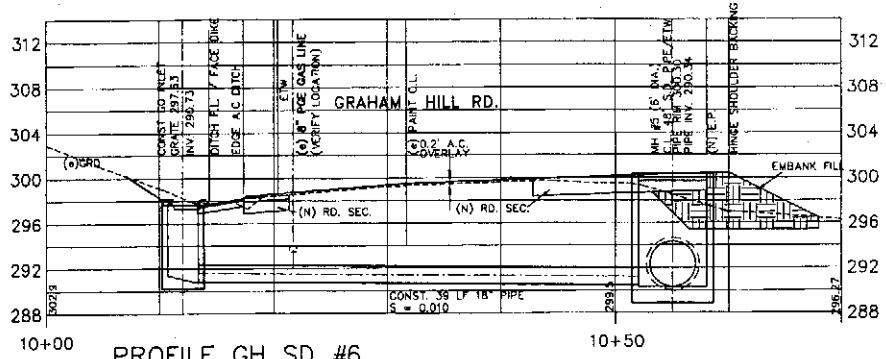


PROFILE - GH SD #1
(13+25 G.H. C.L.) SCALE 1" = 5'
GRAHAM HILL RD.
CONST. 47 LF 18" PIPE S = 0.010
CONST. 22 LF 18" PIPE, S = 0.125
(e)3'X2' WOOD BOX CULV TRIM & PLUG INLET & OUTLET W/ 3 SACK SLURRY OR CONCRETE
GRADE GRD AREA TO DRAIN
(e) 24" CMP CULVERT (REMOVE)
PROFILE - GH S.D. #2
ROARING CAMP DRAINAGE DEPRESSION
(APN 66-212-05, STA 13+30 G.H. C.L.)
SCALE 1" = 5'
CONST. 22 LF 18" PIPE S = 0.031
PROFILE GH SD #3
(14+08 G.H. C.L.) SCALE 1" = 5'
CONST. 34 LF 18" PIPE S = 0.010
EMBANK FILL
PROFILE GH SD #4
(15+25 G.H. C.L.) SCALE 1" = 5'
CONST. 38 LF 18" PIPE S = 0.010
STORM DRAIN PROFILES
COUNTY OF SANTA CRUZ - DEPARTMENT OF PUBLIC WORKS
GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. - 0.61 MILES EAST
PROJECT ENGINEER
C. VESTER
DRAWN: CIV
CHECKED: SBW
DATE: 02/09
SCALE: AS SHOWN
JOB NO. 40265
SHEET 23 OF
f:\engr\road\Graham Hill Rd - 3ft. shoulder

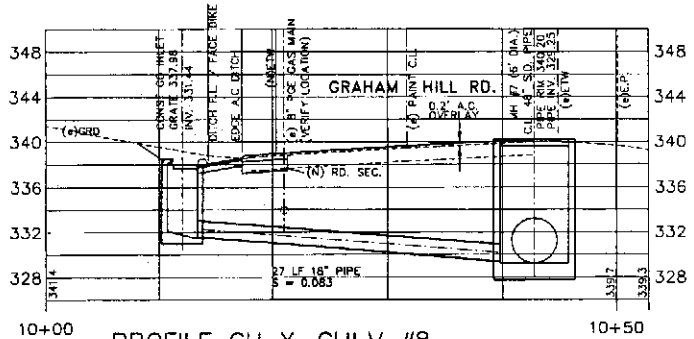
EXHIBIT A



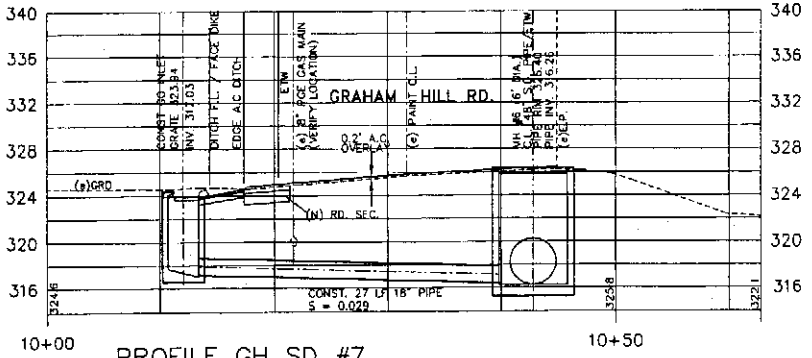
PROFILE GH SD #5 -18" ROADSIDE STORM DRAIN
(STA 15+25 - 16+75 G.H. C.L.) SCALE 1" = 5'



PROFILE GH SD #6
(18+25 G.H. C.L.) SCALE 1" = 5'



PROFILE GH X-CULV #8
(23+00 G.H. C.L.) SCALE 1" = 5'



PROFILE GH SD #7
(21+50 G.H. C.L.) SCALE 1" = 5'

STORM DRAIN PROFILES

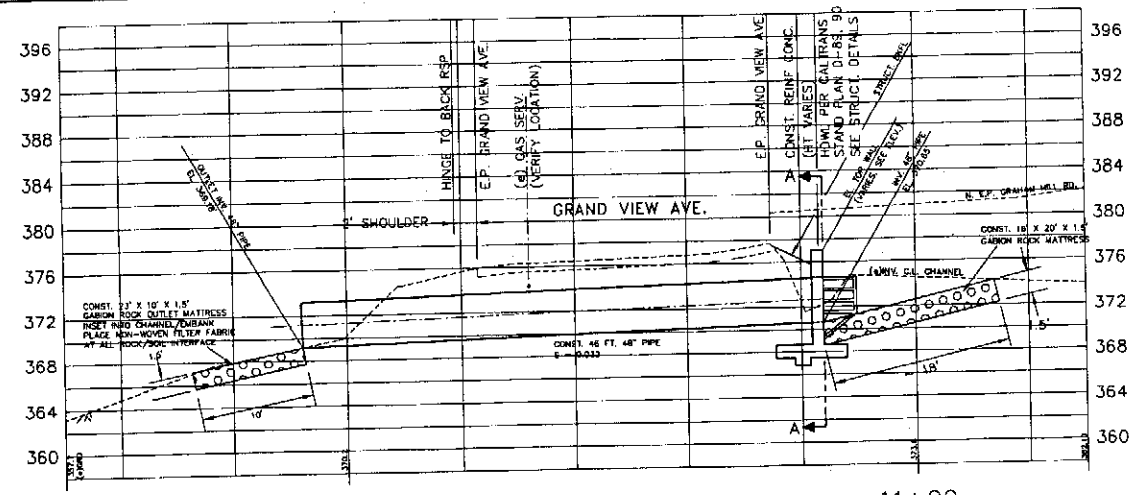
STORM DRAIN PROFILES		SHEET NAME: STORM DRAIN PROFILES	DRAWING NAME: GRAHAM HILL RD.

COUNTY OF SANTA CRUZ - DEPARTMENT OF PUBLIC WORKS
PROJECT ENGINEER: C. VESTER
GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. - 0.61 MILES EAST

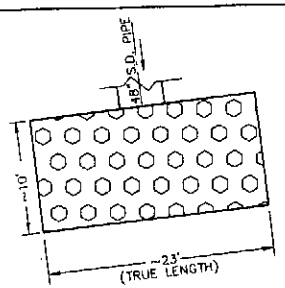
DRAWN:	CIV
CHECKED:	SBW
DATE:	02/09
SCALE:	AS SHOWN
JOB NO.	40265
SHEET	24 OF

- 30 -

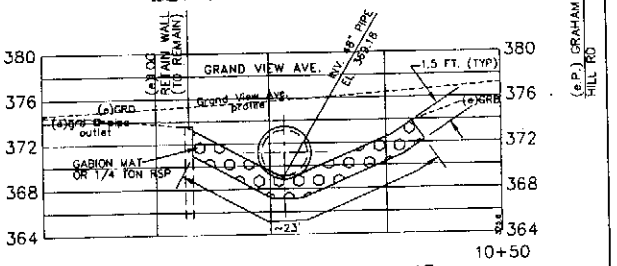
EXHIBIT



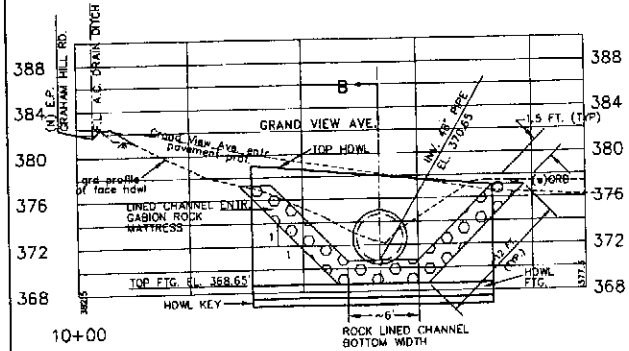
PROFILE SD #9 – GRAND VIEW AVE.
48" CROSS CULVERT SCALE 1" = 5'



PLAN – 48" X-CULV. @ GRAND VIEW.
OUTLET GABION MAT
SCALE 1" = 5'

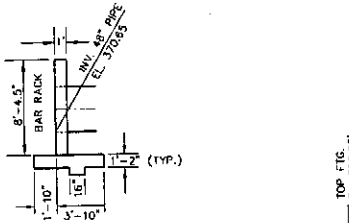


ELEV. 48' OUTLET GABION MAT
@ GRAND VIEW AVE. X-CULV.
(LOOKING DOWNSTREAM) SCALE 1" = 5'



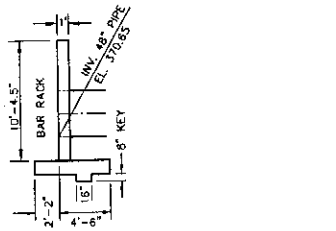
(SEE CALTRANS PLAN D-89,90 FOR WALL/FTG. DIMENSIONS & REINF & CONST. DETAILS)

SEC A–A 48' INLET HDWL
@ GRAND VIEW AVE. X-CULV.
SCALE 1" = 5' (LOOKING DOWNSTREAM)



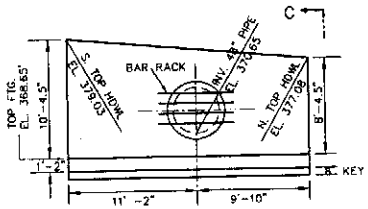
H = 8'-4.5"

SEC C–C 48" X-CULV. INLET HDWL
@ GRAND VIEW AVE. SCALE 1" = 5'

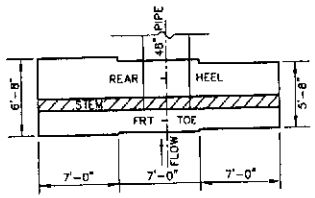


H = 10'-4.5"

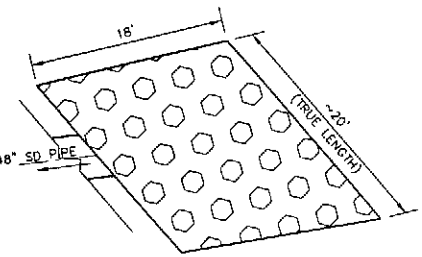
SEC C–C 48" X-CULV. INLET HDWL
@ GRAND VIEW AVE. SCALE 1" = 5'



ELEV. 48' X-CULV. INLET HDWL
@ GRAND VIEW AVE. (LOOKING DOWNSTREAM)
SCALE 1" = 5'



PLAN – 48" INLET HDWL FTG.
@ GRAND VIEW AVE. X-CULV.
SCALE 1" = 5'



PLAN – 48" X-CULV. @ GRAND VIEW
INLET GABION MAT
SCALE 1" = 5'

STORM DRAIN PROFILES
& STRUCTURAL DETAILS

SHEET NAME: STORM DRAIN DRAWING NAME: GRAHAM HILL RD.

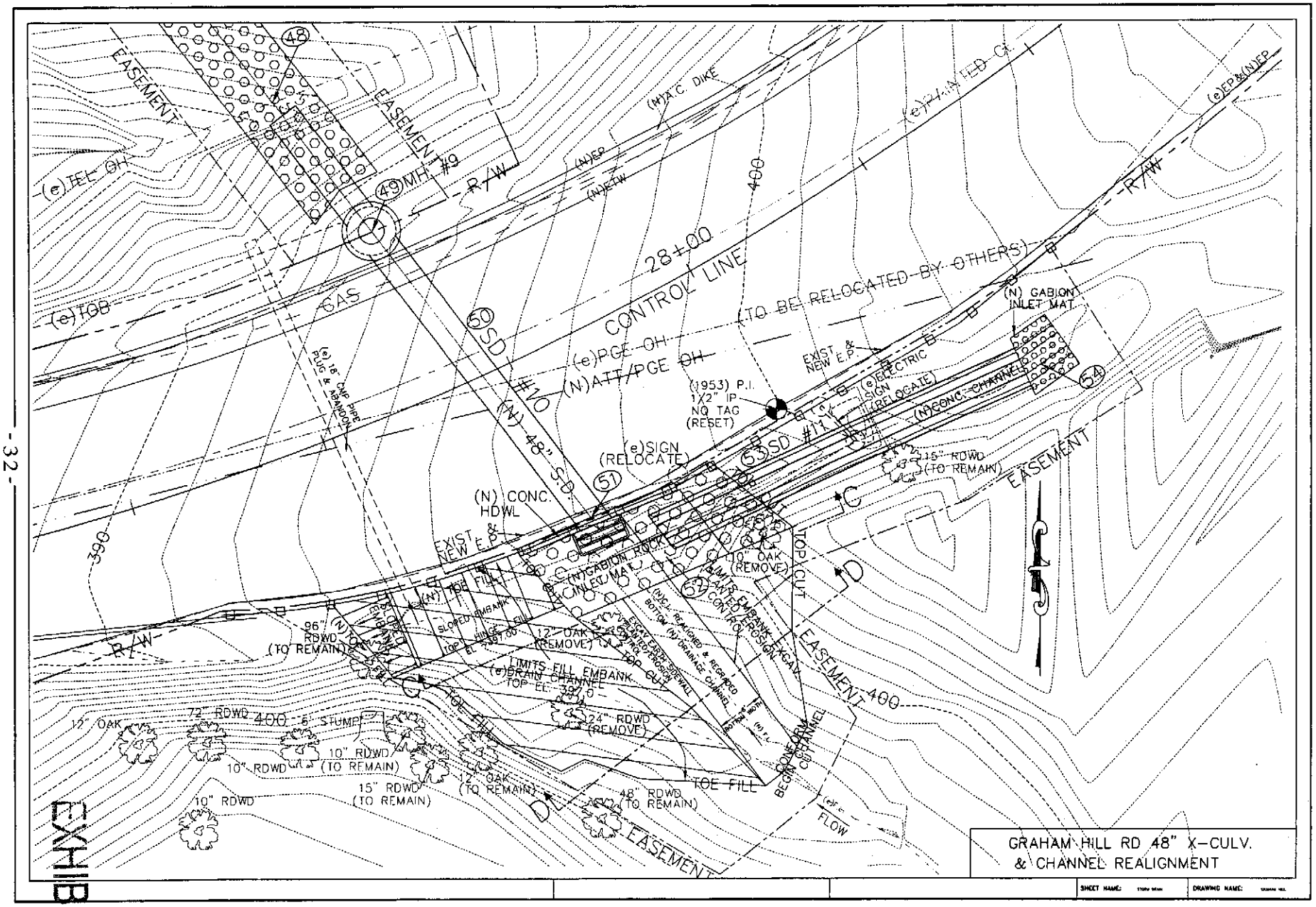
COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS
PROJECT ENGINEER: C. VESTER
GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. – 0.61 MILES EAST

DRAWN: CIV
CHECKED: SBW
DATE: 02/09
SCALE: AS SHOWN
JOB NO. 40265
SHEET 25 OF

REVISION | BY | DATE

- 31 -

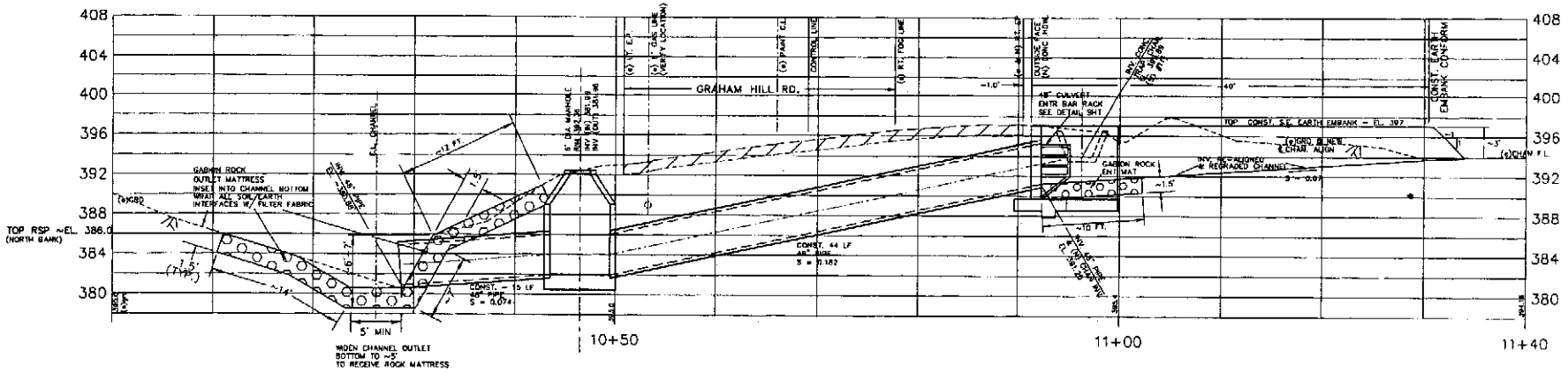
EXHIBIT A



COUNTY OF SANTA CRUZ - DEPARTMENT OF PUBLIC WORKS	PROJECT ENGINEER: C. VESTER
GRAHAM HILL RD. IMPROVEMENT PROJECT ROARING CAMP RD. – 0.61 MILES EAST	
DRAWN: CIV	
CHECKED: SBW	
DATE: 02/09	
SCALE: 1" = 5'	
JOB NO. 40265	
SHEET 26 OF	

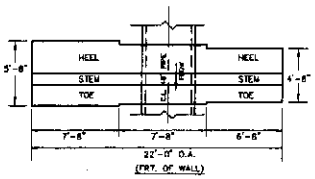
DATE | REVISION | BY

EXHIBIT A

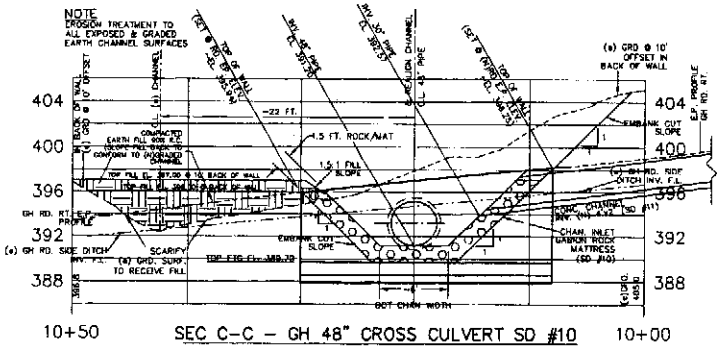


PROFILE GRAHAM HILL RD. SD #10

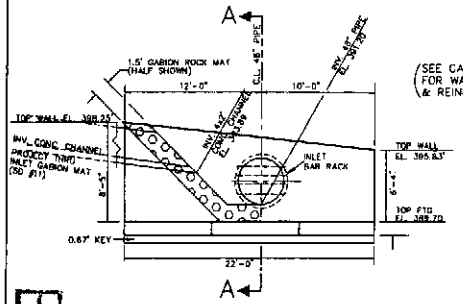
48" X-CULVERT (STA 27+75) SCALE 1" = 5'



GH 48" X-CULV. INLET HDWL FTG
PLAN VIEW SCALE 1" = 5'

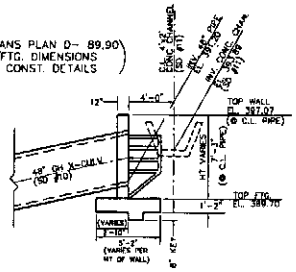


SEC C-C - GH 48" CROSS CULVERT SD #10
(CHANNEL INLET X-SEC, 10 FT OFFSET LOOKING UPSTREAM)
SCALE 1" = 5'

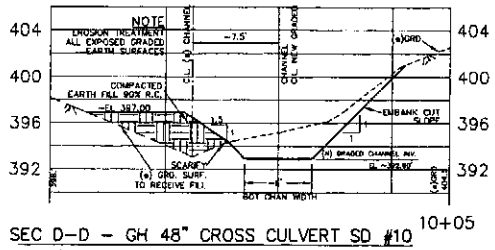


GH 48" SD INLET HDWL
ELEV. (LOOKING UPSTREAM)
SCALE 1" = 5'

(SEE CALTRANS PLAN D- 89,90) FOR WALL/FTG. DIMENSIONS & REINF & CONST. DETAILS



SEC A-A GH 48" X-CULV. SD
(INLET HDWL) (LOOKIN UP G.H. RD.)
SCALE 1" = 5'



SEC D-D - GH 48" CROSS CULVERT SD #10
(CHANNEL X-SEC, 26 FT OFFSET LOOKING UPSTREAM)
SCALE 1" = 5'

STORM DRAIN PROFILES & STRUCTURAL DETAILS

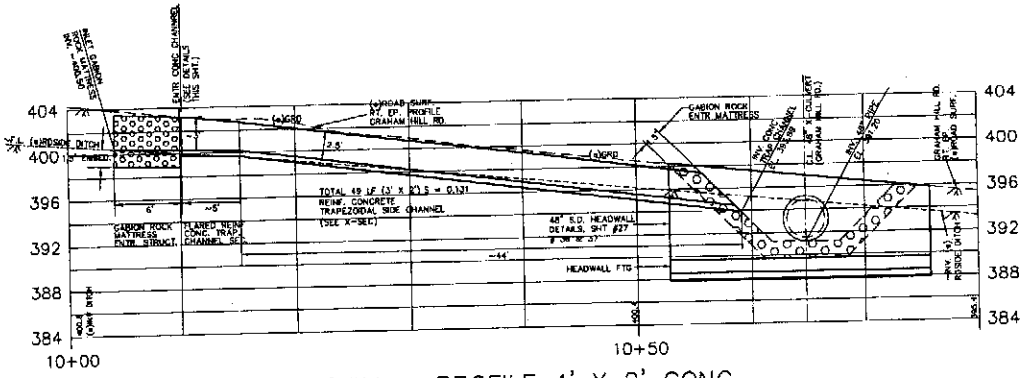
SHEET NAME: STORM DRAIN | DRAWING NAME: GRAHAM HILL RD.

COUNTY OF SANTA CRUZ - DEPARTMENT OF PUBLIC WORKS
PROJECT ENGINEER: C. VESTER
GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. - 0.61 MILES EAST

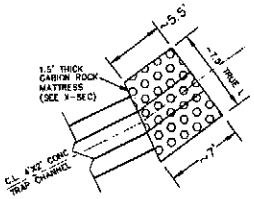
DRAWN:	CIV
CHECKED:	SBW
DATE:	02/09
SCALE:	AS SHOWN
JOB NO.	40265
SHEET	27 OF

REVISION | BY | DATE

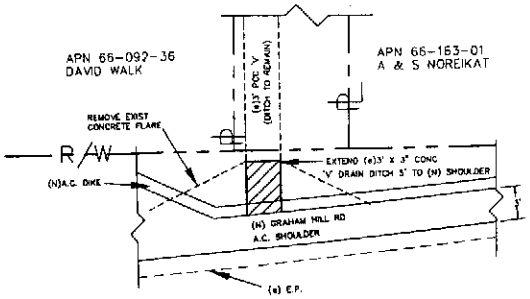
EXHIBIT A



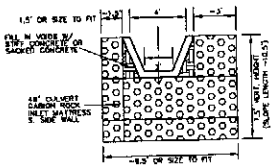
GH SD#11 – PROFILE 4' X 2' CONC.
TRAP DRAIN CHANNEL SCALE 1" = 5'



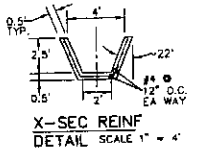
PLAN – GH RD. 4'X2' CONC TRAP
CHANNEL INLET GABION MAT SCALE 1" = 5'



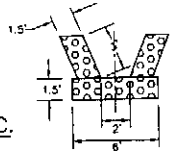
PLAN – N. CONC. 'V' DITCH
APN 66-092-36 SCALE 1" = 5'
(STA 16+75)



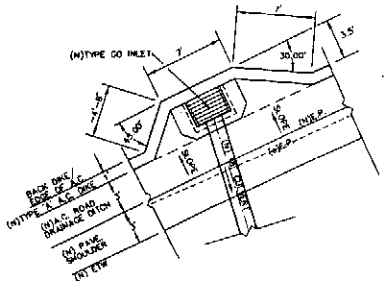
X-SEC – G. H. RD. 4'X2' CONC.
TRAP. SIDE CHANNEL OUTLET
GABION ROCK MATS SCALE 1" = 4'



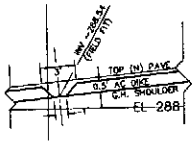
X-SEC REINF
DETAIL SCALE 1" = 4'



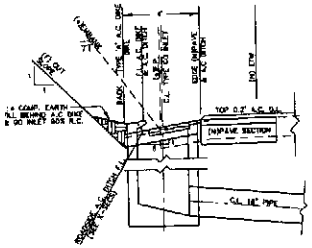
X-SEC INLET
GABION MAT
SCALE 1" = 4'



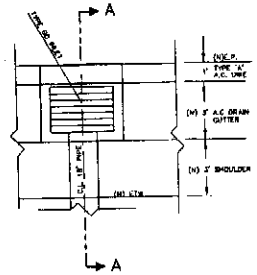
PLAN – N. ROADSIDE A.C SHOULDER
W/ SETBACK GO INLET (TYP.) SCALE: 1" = 5'



ELEV. – N. CONC. 'V' DITCH
APN 66-092-36 SCALE 1" = 5'
(STA 16+75)



SEC A-A – INCLINED GO INLET GRATE
● A.C. ROADSIDE DITCH SCALE: 1" = 5'



PLAN – INCLINED TYPE GO INLET
● A.C. ROADSIDE DITCH SCALE: 1" = 5'
STA 36+05.65 & 42+00.00

STORM DRAIN PROFILES
& STRUCTURAL DETAILS

SHEET NAME: STORM DRAIN DRAWING NAME: GRAHAM HILL

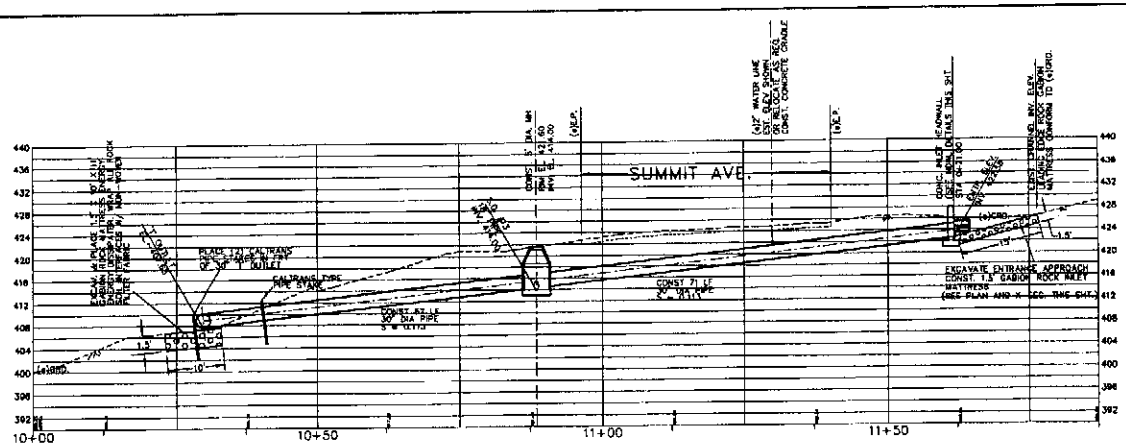
BY | REVISION | DATE

COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS
PROJECT ENGINEER: C. VESTER
GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. – 0.61 MILES EAST

DRAWN: CiV
CHECKED: SBW
DATE: 02/09
SCALE: AS SHOWN
JOB NO. 40265
SHEET 28 OF

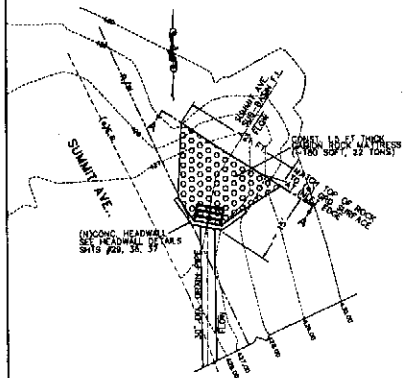
- 34 -

EXHIBIT A



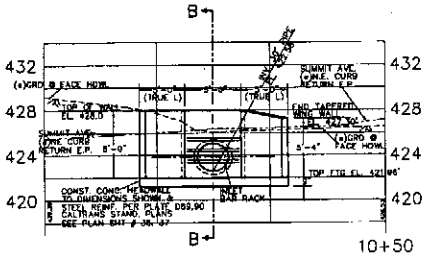
PROFILE SD#12 – 30" CULVERT SUMMIT AVE SUB-BASIN

SCALE 1" = 10'

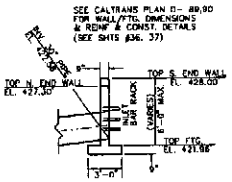


PLAN – SUMMIT AVE. SUB-BASIN
INLET HDWL & GABION ROCK MATTRESS

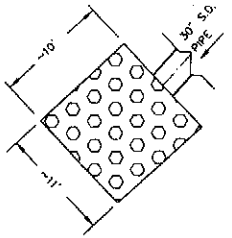
SCALE 1" = 10'



ELEV. – INLET HEADWALL & 30" DIA. CULVERT
SUMMIT AVE. DRAINAGE SUB-BASIN
(LOOKING DOWN STREAM) SCALE 1" = 5'

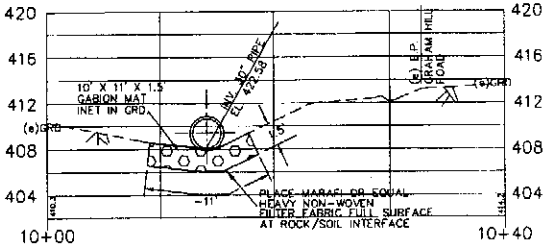


SEC B-B INLET HDWL
30" DIA. CULVERT
SUMMIT AVE. SCALE 1" = 5'



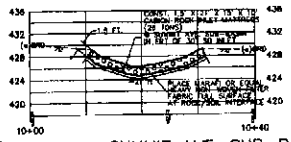
PLAN – SUMMIT AVE. SUB-BASIN
30" OUTLET GABION ROCK MATTRESS

SCALE 1" = 5'



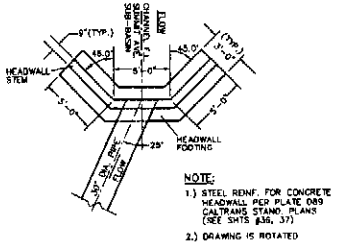
SEC. A-A – SUMMIT AVE. SUB-BASIN
30" OUTLET GABION ROCK MATTRESS

SCALE 1" = 5'



SEC. A-A – SUMMIT AVE. SUB-BASIN
INLET GABION ROCK MATTRESS

SCALE 1" = 10'



PLAN – INLET HDWL SUMMIT AVE.
30" DIA. CULVERT

SCALE 1" = 5'

STORM DRAIN PROFILES
& STRUCTURAL DETAILS

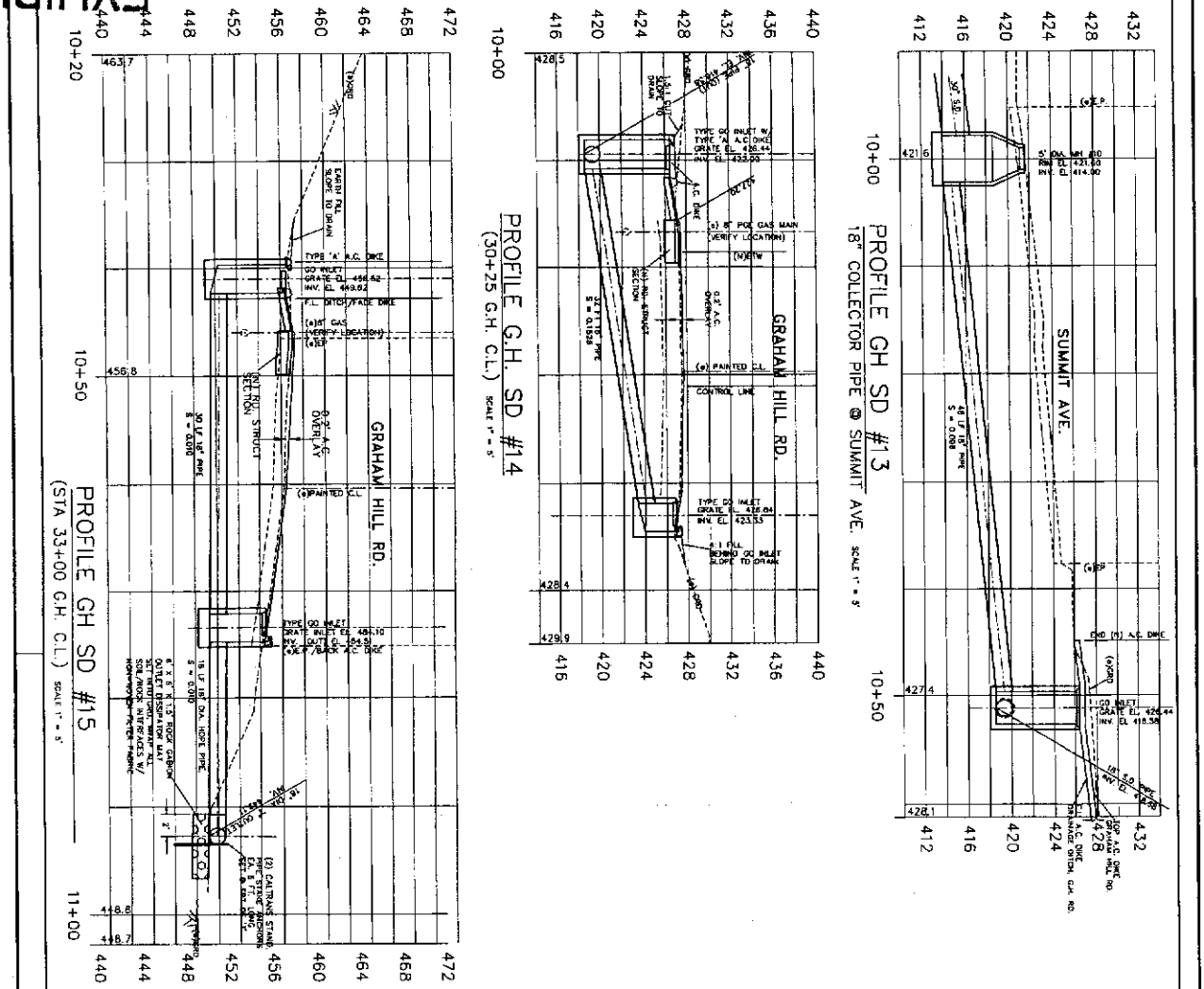
SHEET NAME:	DRAWING NAME:

COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS	PROJECT ENGINEER: C. VESTER
GRAHAM HILL RD. IMPROVEMENT PROJECT	
ROARING CAMP RD. – 0.61 MILES EAST	
DRAWN: CIV	
CHECKED: SBW	
DATE: 02/09	
SCALE: AS SHOWN	
JOB NO. 40265	
SHEET 29 OF	

- 35 -

EXHIBIT A

EXHIBIT A

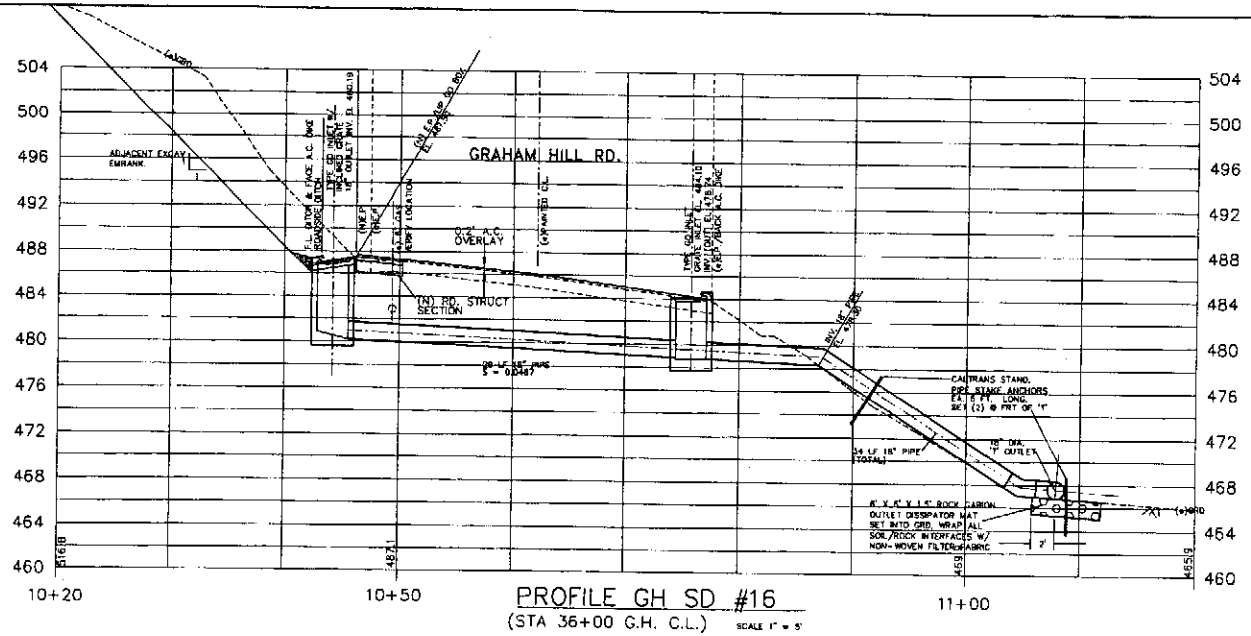


STORM DRAIN PROFILES

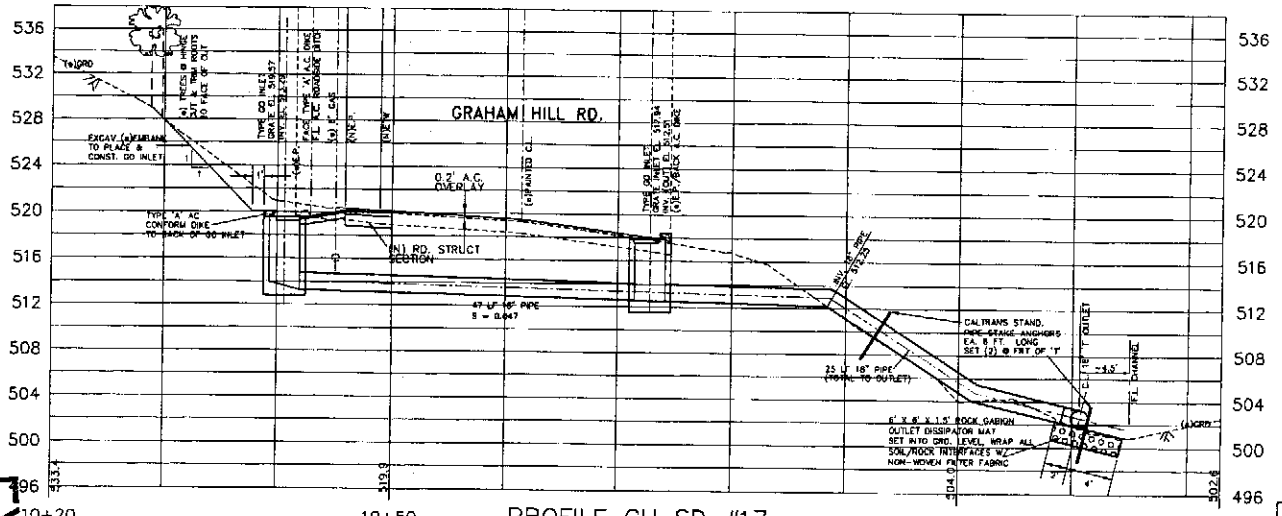
SHEET NAME:	STORM DRAIN
DRAWING NAME:	

COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS	PROJECT ENGINEER	DATE	REVISION
GRAHAM HILL RD. IMPROVEMENT PROJECT ROARING CAMP RD. – 0.61 MILES EAST	C. VESTER		

DRAWN: CIV
CHECKED: SBW
DATE: 02/09
SCALE: AS SHOWN
JOB NO. 40265
SHEET 30 OF



PROFILE GH SD #16
(STA 36+00 G.H. C.L.) SCALE 1" = 5'



PROFILE GH SD #17
(39+00 G.H. C.L.) SCALE 1" = 5'

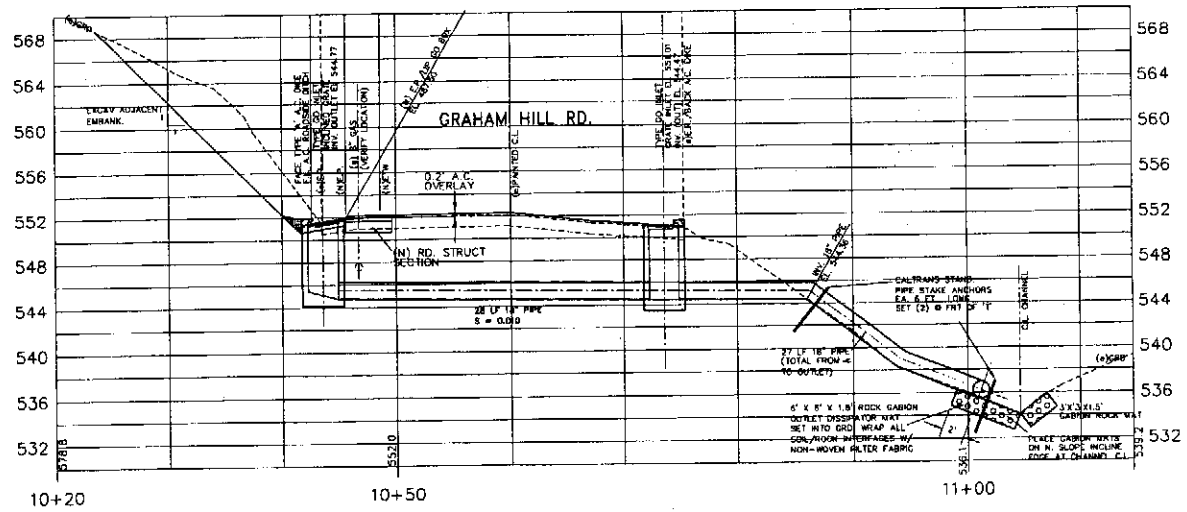
STORM DRAIN PROFILES

SHEET NAME: STORM DRAIN DRAWING NAME: GRAHAM HILL RD.

COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS	
GRAHAM HILL RD. IMPROVEMENT PROJECT ROARING CAMP RD. – 0.61 MILES EAST	PROJECT ENGINEER C. VESTER
DRAWN: CIV	
CHECKED: SBW	
DATE: 02/09	
SCALE: AS SHOWN	
JOB NO: 40265	
SHEET 31 OF	

DATE | BY | REVISION

EXHIBIT A



PROFILE GH SD #18

(42+00 G.H. C.L.) SCALE 1" = 5'

STORM DRAIN PROFILES

SHEET NAME: DRAWING NAME:

COUNTY OF SANTA CRUZ - DEPARTMENT OF PUBLIC WORKS

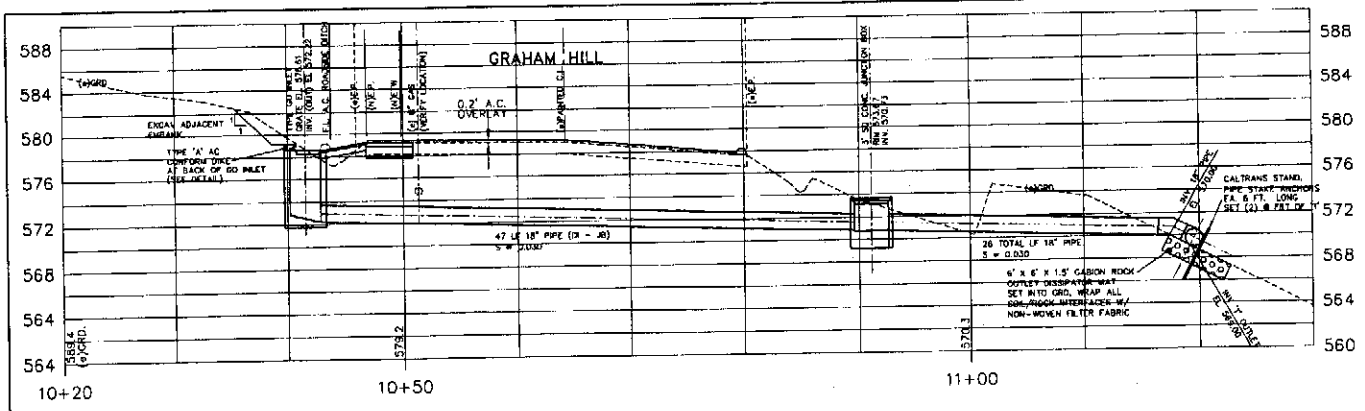
GRAHAM HILL RD. SAFETY IMPROVEMENT PROJECT
ROARING CAMP RD. - 0.61 MILES EAST

PROJECT ENGINEER: C. VESTER

DRAWN: CIV
CHECKED: SBW
DATE: 02/09
SCALE: AS SHOWN
JOB NO. 40265
SHEET 32 OF

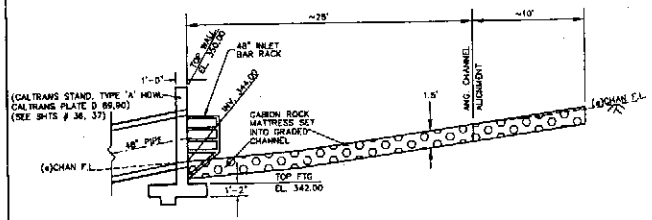
BY | DATE | REVISION

EXHIBIT A

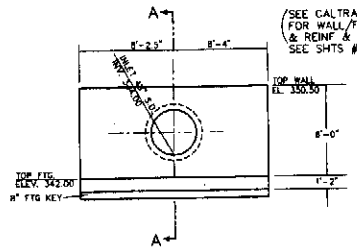


PROFILE GH SD #19

(44+40 G.H. C.L.) SCALE 1" = 5'

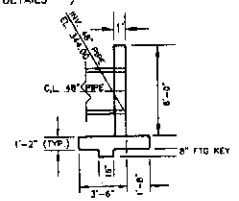


PROFILE – 48" MAIN SD INLET HDWL (STA 24+00) SCALE 1" = 5'

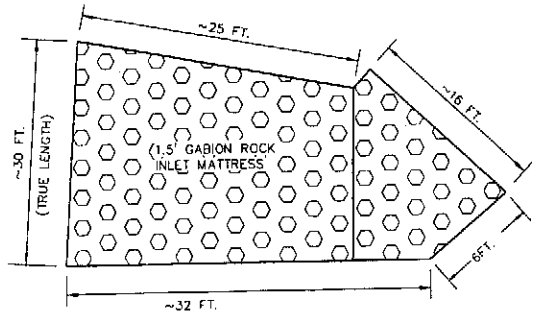


ELEV. – 48" MAIN SD INLET HDWL SCALE 1" = 5'

(STA 24+00–LOOKING UPSTREAM)

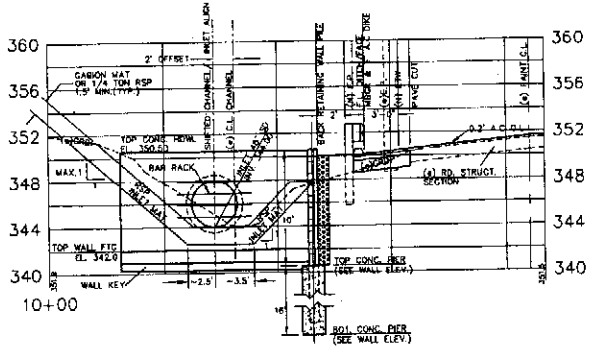


SEC A–A 48" MAIN SD INLET HDWL SCALE 1" = 5'



PLAN – 48" MAIN SD INLET ROCK MATTRESS (STA 24+00)

SCALE 1" = 5'



X–SEC – 48" MAIN SD INLET HDWL

(STA 24+00–LOOKING UPSTREAM) SCALE 1" = 5'

STORM DRAIN PROFILES & STRUCTURAL DETAILS

SHEET NAME: STORM DRAIN | DRAWING NAME: GRAHAM HILL RD

BY | REVISION | DATE

COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS

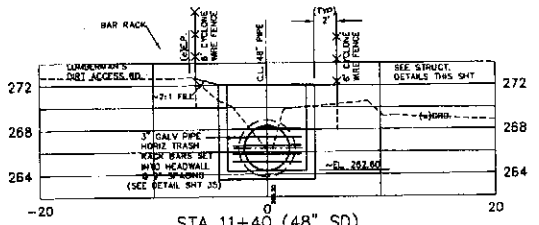
PROJECT ENGINEER: C. VESTER

GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. – 0.61 MILES EAST

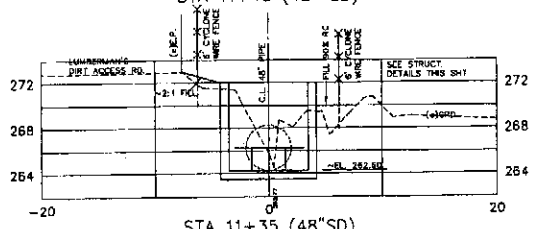
DRAWN: CIV
CHECKED: SBW
DATE: 02/09
SCALE: AS SHOWN
JOB NO. 40265
SHEET 33 OF

-39-

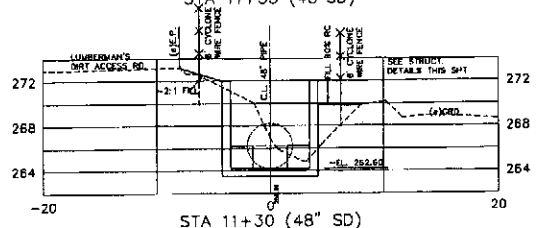
EXHIBIT A



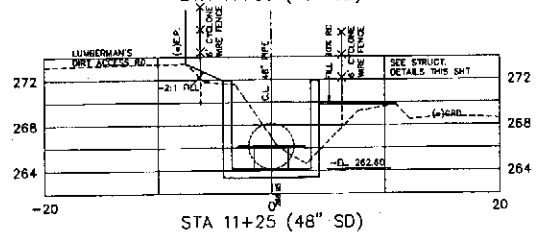
STA 11+40 (48" SD)



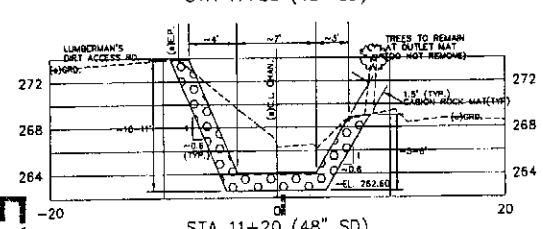
STA 11+35 (48"SD)



STA 11+30 (48" SD)



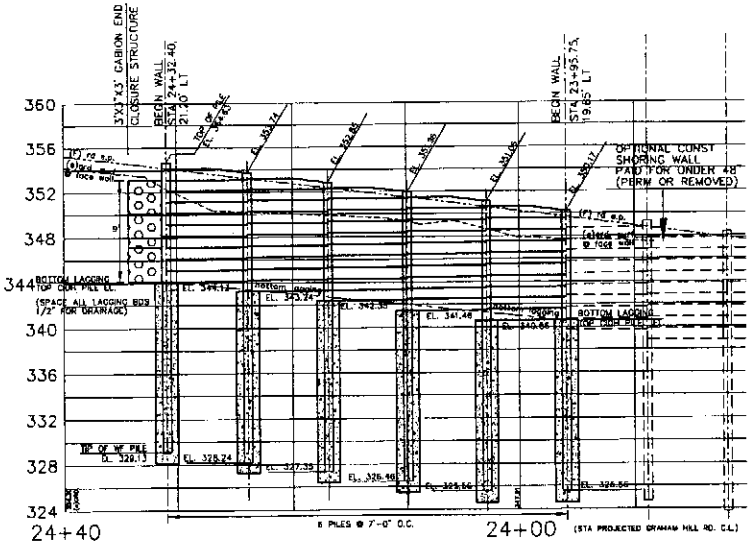
STA 11+25 (48" SD)



STA 11+20 (48" SD)

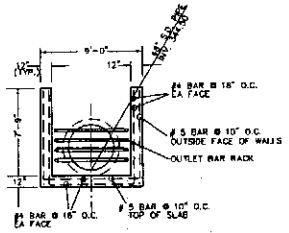
48" S.D. OUTLET X-SECS

SCALE: 1" = 5'

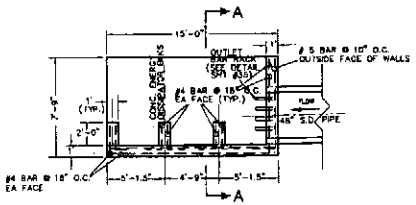


ELEV. MAIN 48" SD INLET RETAINING WALL

SCALE 1" = 5'

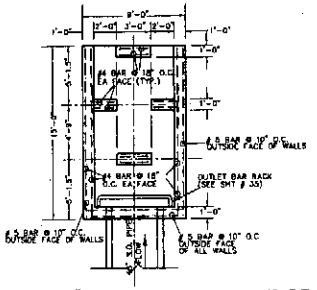


SEC A-A 48" S.D. OUTLET STRUCTURE



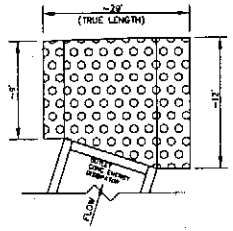
PROFILE 48" S.D. OUTLET STRUCTURE

SCALE: 1" = 5'



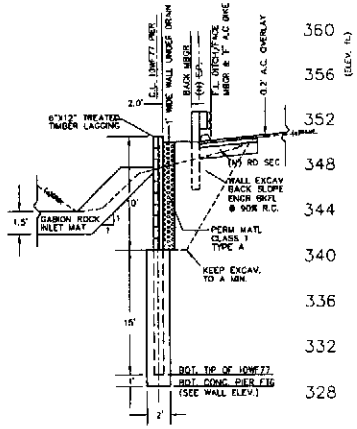
PLAN 48" S.D. OUTLET STRUCTURE

SCALE: 1" = 5'



PLAN - 48" S.D. OUTLET GABION MAT

SCALE: 1" = 5'



X-SEC 48" SD RETAIN WALL CONST. DETAILS

SCALE 1" = 5'

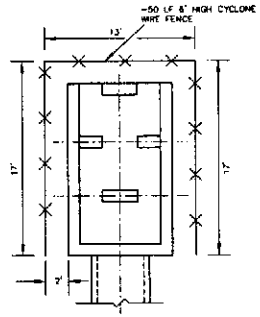
MATERIAL SPECIFICATIONS

1.) STRUCTURAL STEEL F_y = 50,000 PSI

2.) TREATED TIMBER (doug fir #1 minimum) F_b = 1,750 PSI

3.) CL 2 FOOTING CONCRETE F'_c = 3,000 PSI

4.) ALL STEEL CONST. SHALL CONFORM TO AMERICAN INSTITUTE OF STEEL CONST. (AISC) ALL CONCRETE CONSTRUCTION SHALL CONFORM TO AMERICAN CONCRETE INSTITUTE (ACI)



PLAN 48" S.D. OUTLET STRUCTURE CHAIN LINK FENCING

SCALE: 1" = 5'

48" S.D. OUTLET STRUCTURE & RETAINING WALL DETAILS

SHEET NAME: | DRAWING NAME:

COUNTY OF SANTA CRUZ - DEPARTMENT OF PUBLIC WORKS

GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. - 0.61 MILES EAST

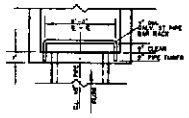
PROJECT ENGINEER: C. VESTER

DRAWN:	CIV
CHECKED:	SBW
DATE:	02/09
SCALE:	AS SHOWN
JOB NO.	40265
SHEET	34 OF

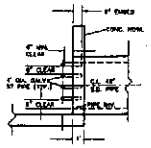
BY | DATE | REVISION

-40-

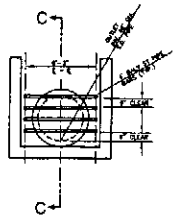
EXHIBIT A



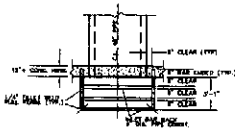
PLAN – OUTLET STRUCTURE
48" S.D BAR RACK SCALE: 1" = 5'



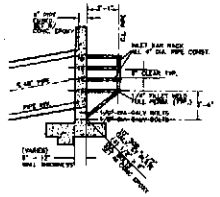
SEC C–C – OUTLET STRUCTURE
48" S.D. BAR RACK SCALE: 1" = 5'



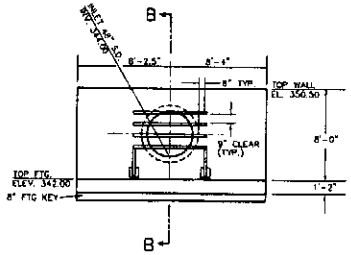
ELEV. – OUTLET STRUCTURE
48" S.D. BAR RACK SCALE: 1" = 5'



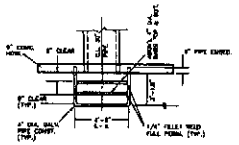
PLAN – 48" S.D. INLET HDWL
BAR RACK SCALE 1" = 5'



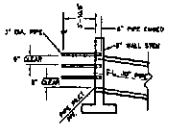
SEC B–B 48" S.D.
INLET HDWL BAR RACK
SCALE 1" = 5'



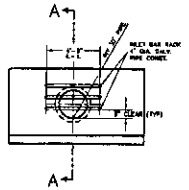
ELEV. 48" S.D.
INLET HDWL BAR RACK SCALE 1" = 5'



PLAN – 30" S.D. INLET HDWL
INLET HDWL BAR RACK
SCALE: 1" = 5'



SEC A–A – 30" S.D.
INLET HDWL BAR RACK
SCALE: 1" = 5'



ELEV. – 30" S.D.
INLET HDWL BAR RACK
SCALE: 1" = 5'

NOTE:
ALL BAR RACK PIPES & BOLT FASTENINGS DRILLED & PLACED IN CONCRETE HDWALLS SHALL BE SET W/ CONC EPOXY PER THE SPECIAL PROVISIONS.

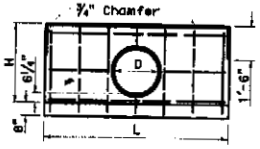
STORM DRAIN HEADWALLS
BAR RACK DETAILS

SHEET NAME: STORM DRAIN | DRAWING NAME:

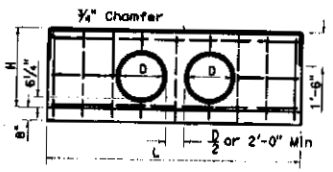
BY	
REVISION	
DATE	
PROJECT ENGINEER	C. VESTER
COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS	
GRAHAM HILL RD. IMPROVEMENT PROJECT ROARING CAMP RD. – 0.61 MILES EAST	
DRAWN: CIV	
CHECKED: SBW	
DATE: 02/09	
SCALE: AS SHOWN	
JOB NO. 40265	
SHEET 35 OF	

-41-

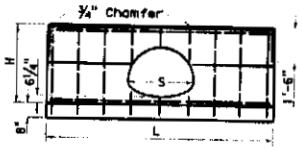
EXHIBIT A



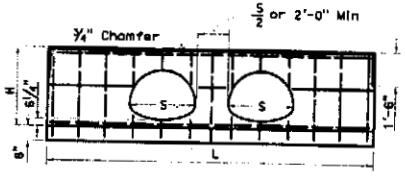
FRONT ELEVATION
SINGLE HEADWALL



FRONT ELEVATION
DOUBLE HEADWALL



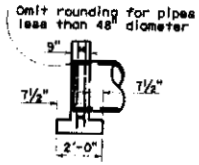
FRONT ELEVATION
SINGLE HEADWALL



FRONT ELEVATION
DOUBLE HEADWALL

D	H	SINGLE L	SINGLE Steel LB	SINGLE Conc CY	DOUBLE L	DOUBLE Steel LB	DOUBLE Conc CY
12"	2'-8"	5'-0"	35	0.60	8'-0"	50	0.94
15"	2'-11"	6'-0"	40	0.75	9'-6"	60	1.17
18"	3'-2"	7'-0"	50	0.91	10'-6"	75	1.35
21"	3'-5"	7'-6"	60	1.02	11'-6"	90	1.52
24"	3'-8"	8'-6"	75	1.20	12'-6"	100	1.72
27"	3'-11"	9'-6"	85	1.39	14'-0"	115	2.00
30"	4'-2"	10'-0"	90	1.52	15'-0"	126	2.21
33"	4'-5"	11'-0"	100	1.73	16'-0"	130	2.42
36"	4'-8"	12'-0"	105	1.95	17'-0"	145	2.65
39"	4'-11"	12'-6"	130	2.09	18'-0"	170	2.88
42"	5'-2"	13'-6"	140	2.34	19'-0"	185	3.13
45"	5'-5"	14'-6"	150	2.60	20'-0"	195	3.38
48"	5'-8"	15'-0"	160	2.75	21'-0"	200	3.64
51"	5'-11"	16'-0"	180	3.03	22'-6"	225	4.02
54"	6'-2"	17'-0"	190	3.31	23'-6"	240	4.30

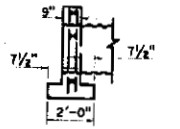
STRAIGHT HEADWALLS



SECTION, SINGLE &
DOUBLE HEADWALLS

CMP ARCH SIZE	H	L	SINGLE Steel LB	SINGLE Conc CY	DOUBLE L	DOUBLE Steel LB	DOUBLE Conc CY
21" x 15"	2'-11"	6'-6"	45	0.80	10'-0"	60	1.22
24" x 18"	3'-2"	7'-6"	50	0.96	11'-6"	70	1.45
28" x 20"	3'-4"	8'-6"	60	1.12	13'-6"	90	1.76
35" x 24"	3'-8"	10'-6"	85	1.47	15'-6"	120	2.16
42" x 29"	4'-1"	12'-6"	110	1.78	18'-0"	145	2.57
49" x 33"	4'-5"	14'-6"	130	2.26	21'-0"	170	3.13
57" x 38"	4'-10"	17'-0"	155	2.81	24'-6"	210	3.86
64" x 43"	5'-3"	19'-0"	175	3.31	27'-6"	230	4.42
71" x 47"	5'-7"	21'-0"	195	3.81	30'-0"	255	5.09

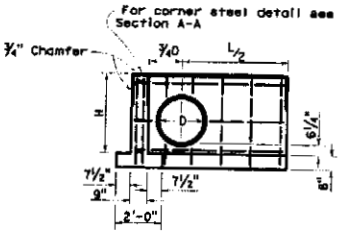
STRAIGHT HEADWALLS



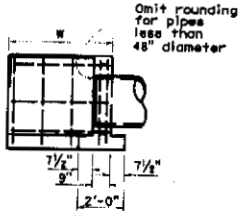
SECTION, SINGLE &
DOUBLE HEADWALLS

NOTES:

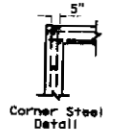
1. No deduction made in quantities for thickness of pipe walls.
2. All reinforcing steel #4 bars. All vertical and horizontal tie bars 1'-6" maximum spacing.
3. Length of wall "W" may be varied to suit conditions encountered in the field, and straight line interpolation may be used to calculate quantities.
4. Quantities are for design purposes only.
5. Cable railing to be installed on top of headwall when shown on Project Plans. See Standard Plan B11-47 for cable railing details.



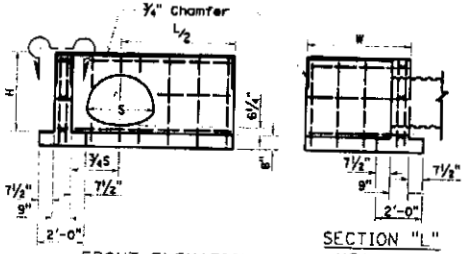
FRONT ELEVATION "L" HEADWALL



SECTION "L" HEADWALL



SECTION A-A



FRONT ELEVATION
"L" HEADWALL

SECTION "L"
HEADWALL

D	H	L/2	LENGTH OF W 3'-4" Steel LB	3'-4" Conc CY	4'-10" Steel LB	4'-10" Conc CY	6'-4" Steel LB	6'-4" Conc CY	7'-10" Steel LB	7'-10" Conc CY	9'-4" Steel LB	9'-4" Conc CY
12"	2'-8"	2'-6"	50	0.79	60	0.98	—	—	—	—	—	—
15"	2'-11"	3'-0"	55	0.91	65	1.11	—	—	—	—	—	—
18"	3'-2"	3'-6"	65	1.04	75	1.25	—	—	—	—	—	—
21"	3'-5"	3'-9"	75	1.15	90	1.36	—	—	—	—	—	—
24"	3'-8"	4'-3"	85	1.29	100	1.51	110	1.74	—	—	—	—
27"	3'-11"	4'-9"	90	1.44	105	1.67	115	1.91	—	—	—	—
30"	4'-2"	5'-0"	95	1.55	110	1.80	120	2.05	135	2.29	—	—
33"	4'-5"	5'-6"	105	1.71	120	1.97	135	2.23	150	2.48	—	—
36"	4'-8"	6'-0"	110	1.88	125	2.15	140	2.41	155	2.68	170	2.95
39"	4'-11"	6'-3"	—	—	150	2.28	170	2.56	185	2.84	200	3.12
42"	5'-2"	6'-9"	—	—	155	2.42	175	2.76	190	3.05	210	3.34
45"	5'-5"	7'-3"	—	—	—	—	180	2.97	200	3.27	215	3.57
48"	5'-8"	7'-6"	—	—	—	—	190	3.13	215	3.44	230	3.75
51"	5'-11"	8'-0"	—	—	—	—	—	—	220	3.67	235	3.99
54"	6'-2"	8'-6"	—	—	—	—	—	—	235	3.91	250	4.24

"L" HEADWALLS
CIRCULAR PIPE CULVERT HEADWALLS

CMP ARCH SIZE	H	L/2	LENGTH OF W 3'-4" Steel LB	3'-4" Conc CY	4'-10" Steel LB	4'-10" Conc CY	6'-4" Steel LB	6'-4" Conc CY	7'-10" Steel LB	7'-10" Conc CY	9'-4" Steel LB	9'-4" Conc CY
21" x 15"	2'-11"	3'-3"	60	1.00	65	1.18	75	1.38	90	1.58	100	1.77
24" x 18"	3'-2"	3'-9"	60	1.07	70	1.32	80	1.53	95	1.74	110	1.94
28" x 20"	3'-4"	4'-3"	70	1.25	80	1.47	90	1.68	100	1.90	115	2.11
35" x 24"	3'-8"	5'-3"	100	1.51	110	1.74	120	1.97	140	2.20	155	2.42
42" x 29"	4'-1"	6'-3"	115	1.82	130	2.06	140	2.31	155	2.55	170	2.83
49" x 33"	4'-5"	7'-3"	130	2.12	145	2.37	155	2.64	170	2.90	185	3.15
57" x 38"	4'-10"	8'-6"	145	2.52	160	2.79	175	3.07	190	3.35	205	3.61
64" x 43"	5'-3"	9'-6"	185	2.89	200	3.11	215	3.48	235	3.77	250	4.06
71" x 47"	5'-7"	10'-6"	200	3.25	215	3.56	235	3.86	250	4.17	270	4.48

"L" HEADWALLS
CORRUGATED METAL PIPE ARCH CULVERT HEADWALLS

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
PIPE CULVERT HEADWALLS STRAIGHT AND 'L'
NO SCALE

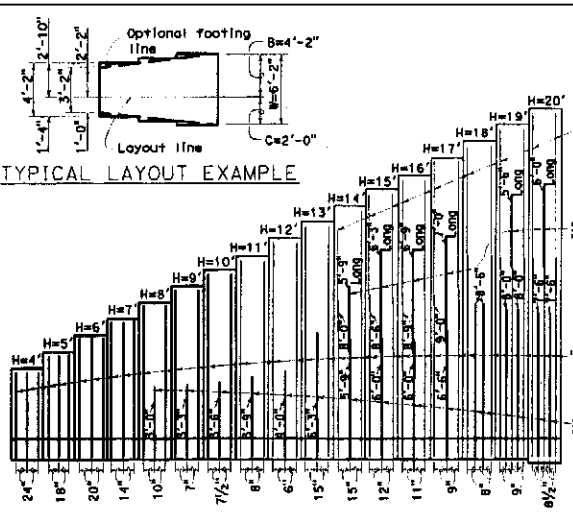
GRAHAM HILL RD. SAFETY IMPROVEMENT PROJECT
ROARING CAMP RD. ~ 0.61 MILES EAST

2006 STANDARD PLAN D89

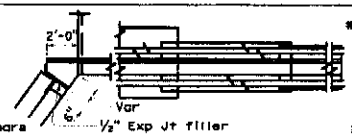
D89
36 of

2-1-08

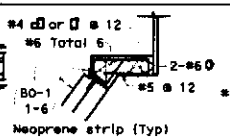
EXHIBIT A



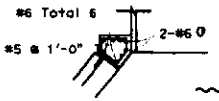
TYPICAL LAYOUT EXAMPLE



PART PLAN A-A

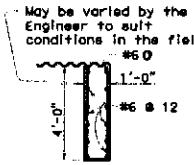


SECTION B-B

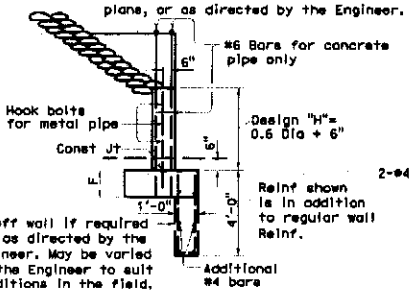


SECTION C-C

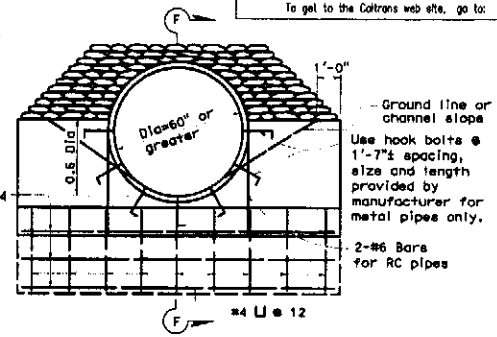
SECTION D-D



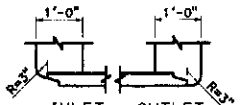
SECTION E-E



SECTION F-F

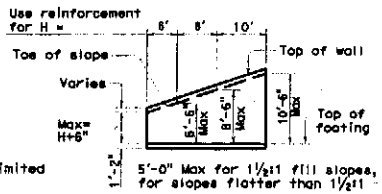


TYPE C WALL



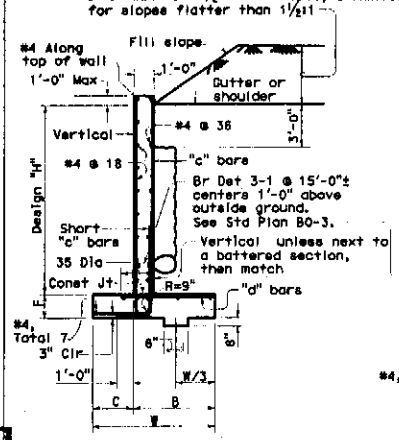
INLET OUTLET

RC PIPE DETAILS

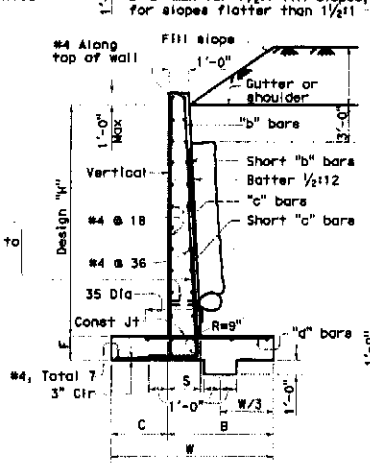


REINFORCED CONCRETE WINGWALLS

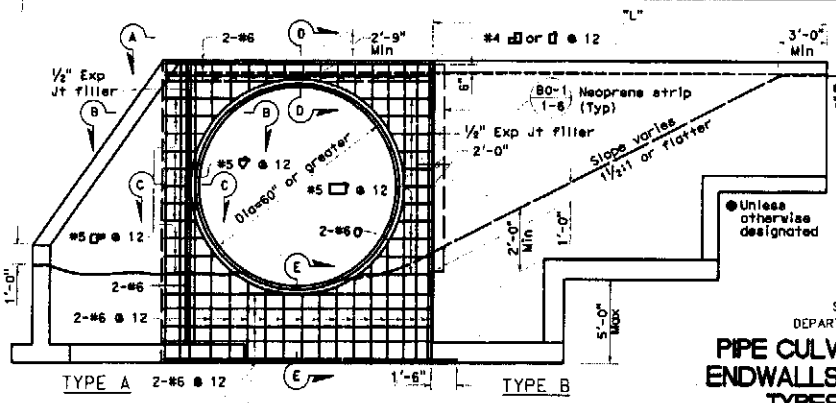
Design "H"	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'	17'	18'	19'	20'
W	3'-2"	3'-8"	4'-2"	4'-8"	5'-2"	5'-8"	6'-2"	6'-8"	7'-2"	7'-8"	8'-0"	8'-8"	9'-4"	10'-0"	10'-8"	11'-4"	12'-0"
C	1'-0"	1'-2"	1'-4"	1'-6"	1'-8"	1'-10"	2'-0"	2'-2"	2'-4"	2'-6"	2'-8"	3'-0"	3'-4"	3'-8"	4'-0"	4'-4"	4'-8"
B	2'-2"	2'-6"	2'-10"	3'-2"	3'-6"	3'-10"	4'-2"	4'-6"	4'-10"	5'-2"	5'-4"	5'-8"	6'-0"	6'-4"	6'-8"	7'-0"	7'-4"
F	1'-2"																1'-4"
Batter	None												½:12				
S	1'-0"										1'-6½"	1'-7"	1'-7½"	1'-8"	1'-8½"	1'-9"	1'-9½"
"b" bars	None											#5 @ 15	#5 @ 12	#5 @ 9	#6 @ 24	#6 @ 18	#7 @ 17
"c" bars	#4 @ 24	#4 @ 18	#5 @ 20	#5 @ 14	#5 @ 10	#6 @ 7	#6 @ 7½	#7 @ 8	#7 @ 6	#8 @ 7½	#9 @ 6	#9 @ 6	#9 @ 5	#10 @ 6	#10 @ 5	#11 @ 6	#11 @ 5
"d" bars	#4 @ 24	#4 @ 18	#5 @ 20	#5 @ 14	#5 @ 10	#6 @ 14	#7 @ 15	#8 @ 16	#7 @ 12	#8 @ 15	#9 @ 15	#9 @ 12	#9 @ 11	#9 @ 9	#9 @ 8	#10 @ 9	#10 @ 8
Conc CY/LF	0.32	0.38	0.44	0.49	0.55	0.61	0.67	0.73	0.79	1.02	1.10	1.18	1.26	1.36	1.45	1.55	1.72
Reinf LB/LF	13	16	19	25	30	37	49	62	76	73	90	104	123	141	170	189	206



TYPICAL SECTION
H=4' THRU 12'



TYPICAL SECTION
H=13' THRU 20'



TYPE A 2-#5 @ 12

TYPE B

END ELEVATION
STRAIGHT WINGWALLS

For footing step dimensions and reinforcement see "Footing Step" on Std Plan B3-8.

NOTE:
Unit Stresses: f_s = 24,000 psi
f'_c = 1,300 psi, n = 10 Maximum
Toe Pressure = 3.0 ksf. Elevation, length and angle of flare of wings may be varied by the Engineer to suit conditions encountered in the field. Walls designed for 2'-0" live load surcharge, 1½:1 sloping surcharge not to exceed 5'-0" in elevation plus 2'-0" live load surcharge, or unlimited 2:1 surcharge. If 1½:1 slope exceeds 5'-0", use Type 2 retaining wall. Wall height may be exceeded by 6" before going to the next greater "H".

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

PIPE CULVERT HEADWALLS, ENDWALLS AND WINGWALLS TYPES A, B AND C

NO SCALE

D90
37 of

GRAHAM HILL RD. SAFETY IMPROVEMENT PROJECT
ROARING CAMP RD. – 0.61 MILES EAST

2006 STANDARD PLAN D90

EXHIBIT A

COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS

GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. – 0.61 MILES EAST

PROJECT ENGINEER
C. YESTER

DRAWN: CIV
CHECKED: SBW
DATE: 02/09
SCALE: 1" = 200'
JOB NO. 40265
SHEET 38 OF

TRAFFIC STRIPING PLAN
STA 10+00 – STA 21+50

TRAFFIC MARKING LEGEND – 2003 MUTCD

STOP BAR

TYPE IV LEFT TURN MARKING

STOP MARKING (FIG 3B -20)

GRAHAM HILL ROAD

ROARING CAMP ROAD

ROARING CAMP R.R.

ENTRANCE

EXHIBIT A

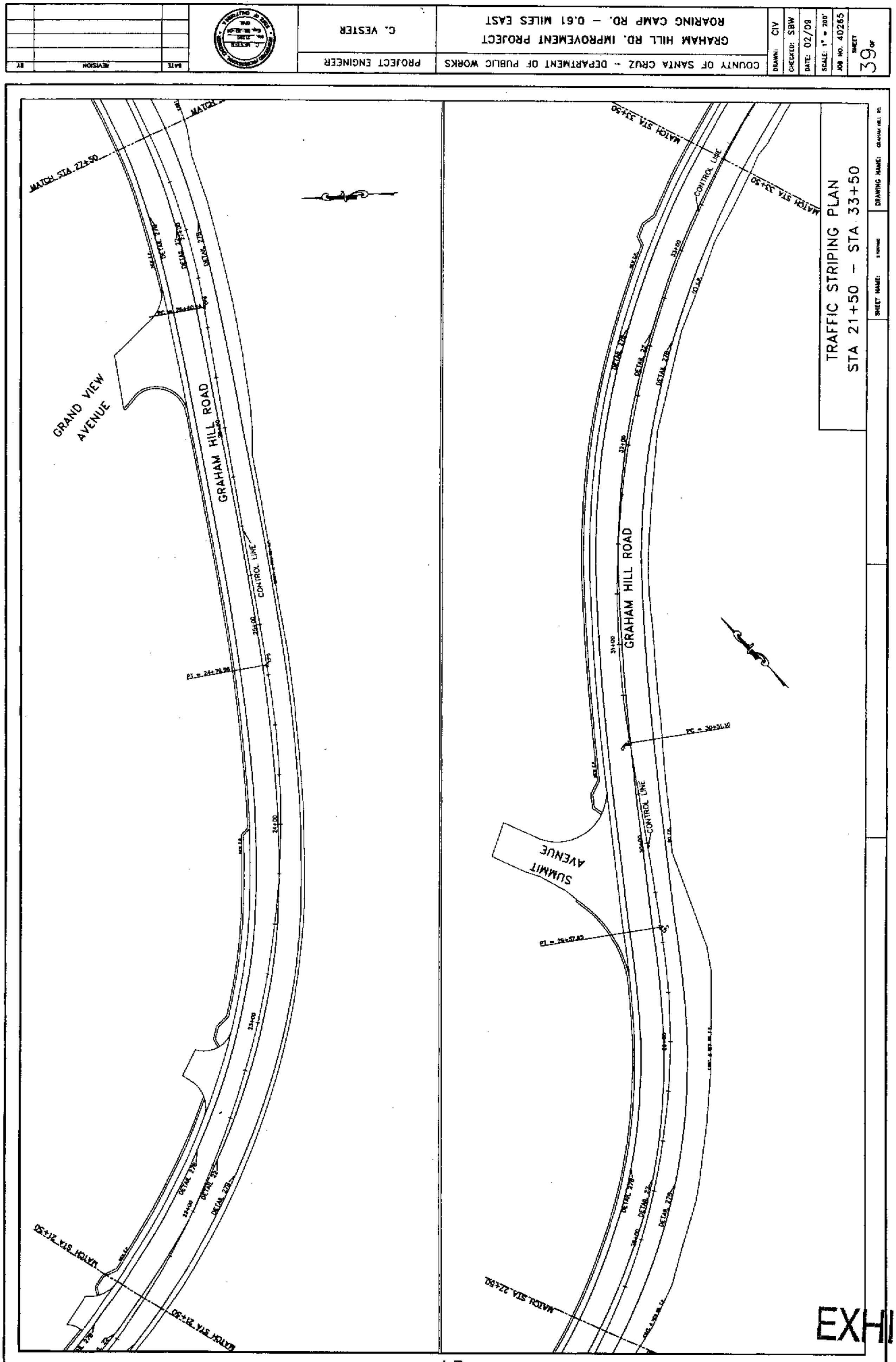
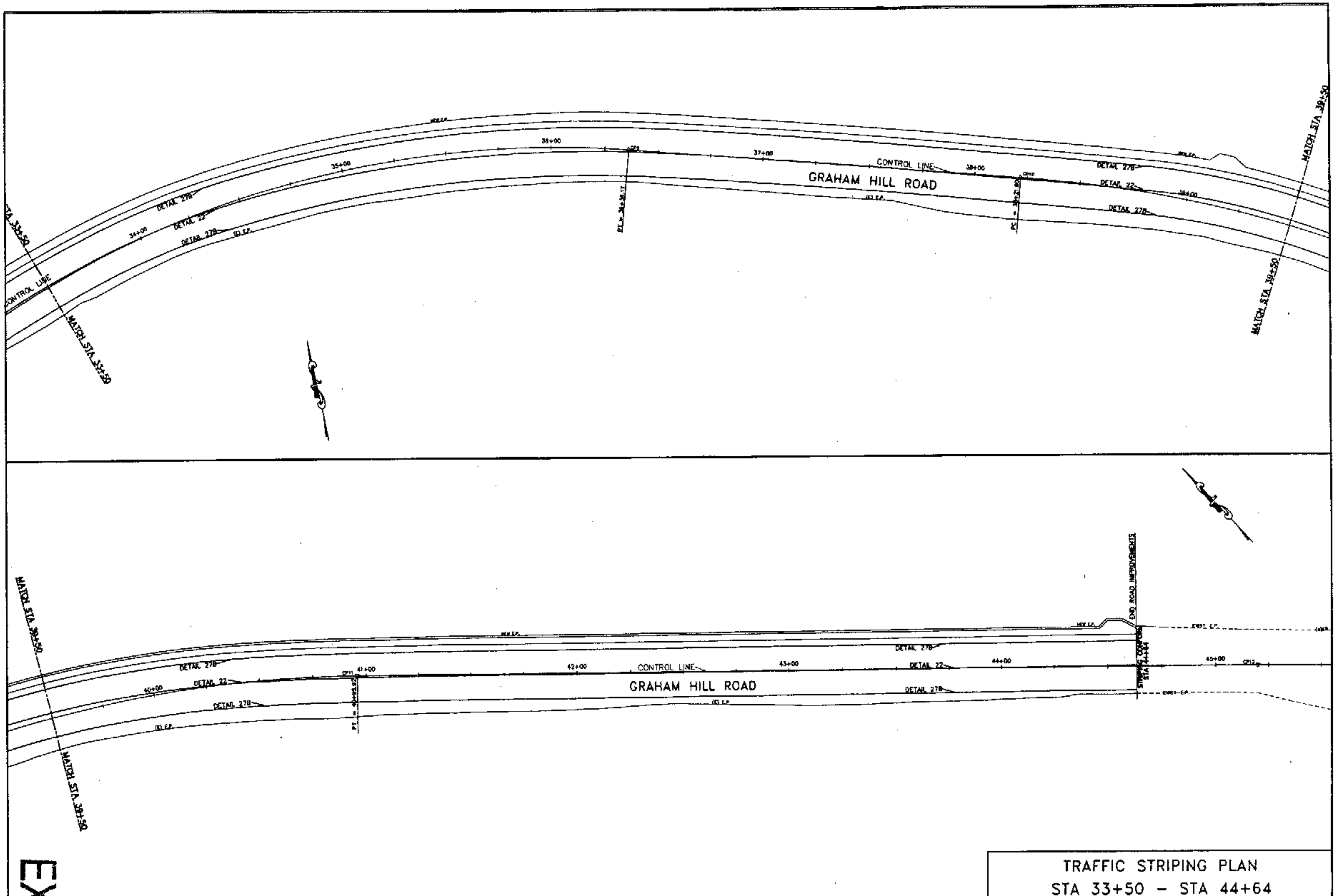

COUNTY OF SANTA CRUZ - DEPARTMENT OF PUBLIC WORKS
GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. - 0.61 MILES EAST
PROJECT ENGINEER
C. VESTER
DRAWN: CIV
CHECKED: SBW
DATE: 02/09
SCALE: 1" = 200'
JOB NO. 40265
SHEET 39
TRAFFIC STRIPING PLAN
STA 21+50 - STA 33+50
GRAHAM HILL ROAD
GRAND VIEW AVENUE
SUMMIT AVENUE
CONTROL LINE
MATCH STA 22+50
MATCH STA 21+50
MATCH STA 33+50

EXHIBIT A



COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS

GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. – 0.61 MILES EAST

PROJECT ENGINEER: C. VESTER

DRAWN:	CIV
CHECKED:	SBW
DATE:	02/09
SCALE:	1" = 200'
JOB NO.	40265
SHEET	40 of

TRAFFIC STRIPING PLAN
STA 33+50 – STA 44+64

SHEET NAME: STRIPING
DRAWING NAME: GRAHAM HILL RD.

EXHIBIT A

BY	REVISION	DATE

C. VESTER

PROJECT ENGINEER

COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS

GRAHAM HILL RD. IMPROVEMENT PROJECT

ROARING CAMP RD. – 0.61 MILES EAST

DRAWN: CIV

CHECKED: SBW

DATE: 02/09

SCALE: AS SHOWN

JOB NO. 40265

SHEET 41 OF

TRAFFIC STRIPING PLAN & MEDIAN GEOMETRICS

SHEET NAME: STRIPING

DRAWING NAME: GRAHAM HILL RD

PLAN GRAHAM HILL RD. NORTH LEFT TURN MEDIAN

SCALE: 1" = 20'

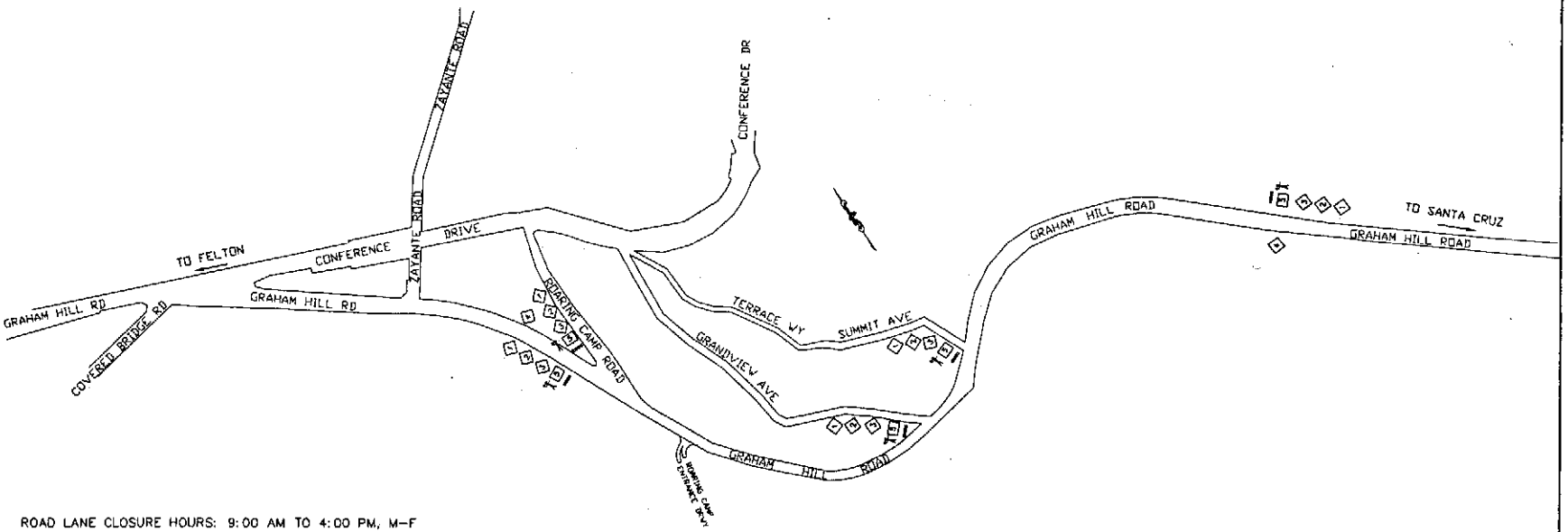
PLAN GRAHAM HILL RD. SOUTH LEFT TURN LANE & MEDIAN

SCALE: 1" = 20'

DETAIL 'A' – NORTH MEDIAN NOSE FLARE

SCALE: 1" = 10'

EXHIBIT A



ROAD LANE CLOSURE HOURS: 9:00 AM TO 4:00 PM, M–F

ALL TRAFFIC CONTROL PROCEDURES TO BE IN ACCORDANCE WITH THE "2006 CALTRANS UNIFORM TRAFFIC MANUAL ON CONTROL DEVICES – TABLE 6H–3 & FIG. 6H–10".

ADVANCE WARNING SIGN SPACING (WHERE POSSIBLE)

ROAD TYPE	DISTANCE BETWEEN SIGNS (m)	
URBAN – LESS THAN 25 MPH	80 m	(200 FT)
URBAN – 30 MPH OR MORE	110 m	(350 FT)

SIGN LEGEND

1. C18 – ONE LANE ROAD AHEAD
2. C9A – FLAGMAN ICON SIGN
3. C36 – PREPARE TO STOP
4. C14 – END ROAD CONSTRUCTION
5. SINGLE LANE TRAFFIC STOP HERE, PROCEED WHEN CLEAR

SPECIAL ADVANCED WARNING SIGN (3) (BLACK ON ORANGE)

ROAD CONSTRUCTION
GRAHAM HILL RD. IMPROVEMENT PROJECT
DATE: _____ THRU DATE: _____
EXPECT DELAYS
RECOMMEND ALTERNATE ROUTE(S)

** PLACEMENT OF 3 SPECIAL ADVANCED WARNING SIGNS TO BE INSTALLED AT LOCATIONS AS SPECIFIED BY THE ENGINEER TWO WEEKS BEFORE CONSTRUCTION BEGINS

TRAFFIC CONTROL PLAN

SHEET NAME: TRAFFIC CONTROL | DRAWING NAME: GRAHAM HILL RD.

BY	DATE	REVISION

PROJECT ENGINEER: C. VESTER

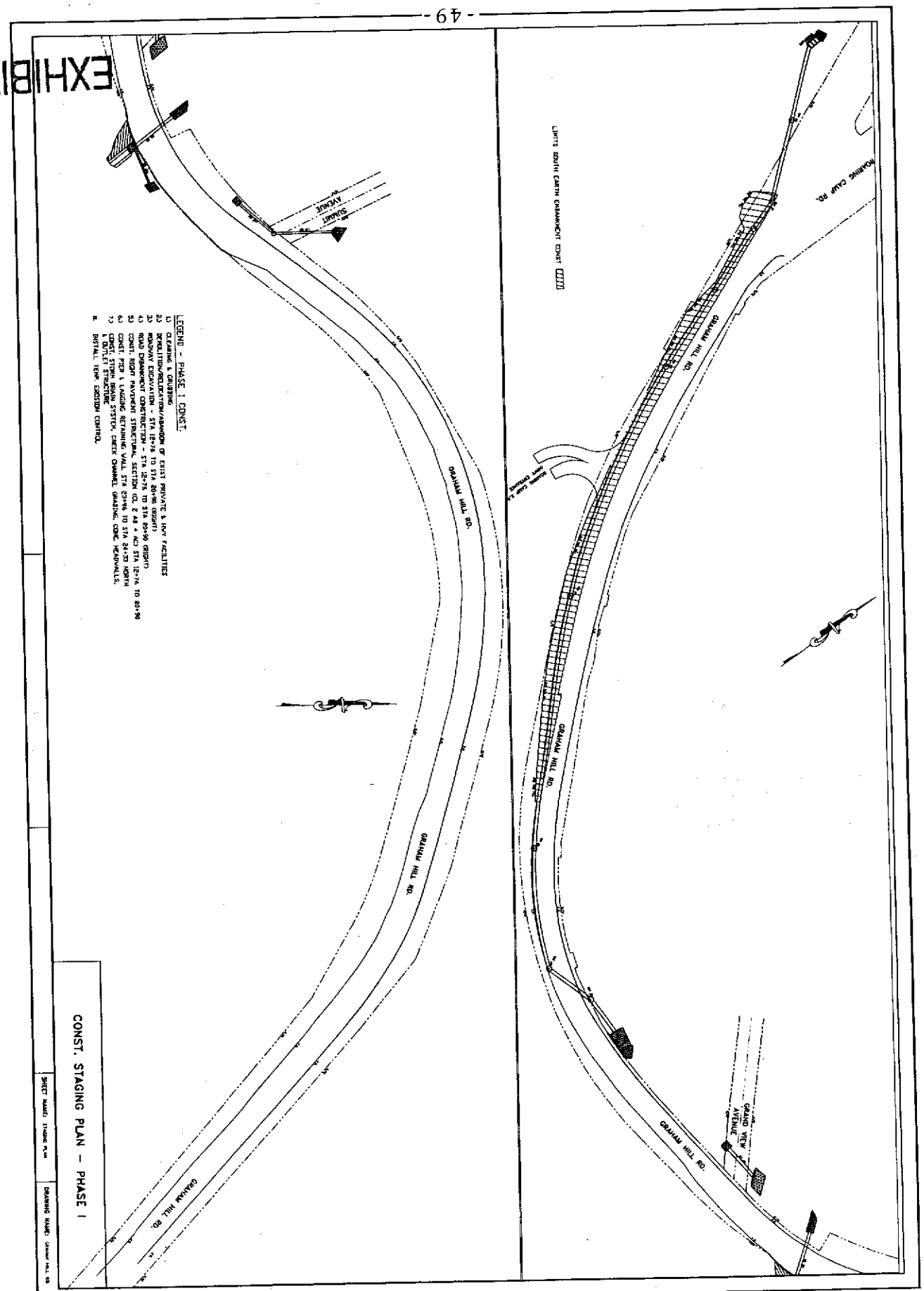
COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS

GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. – 0.61 MILES EAST

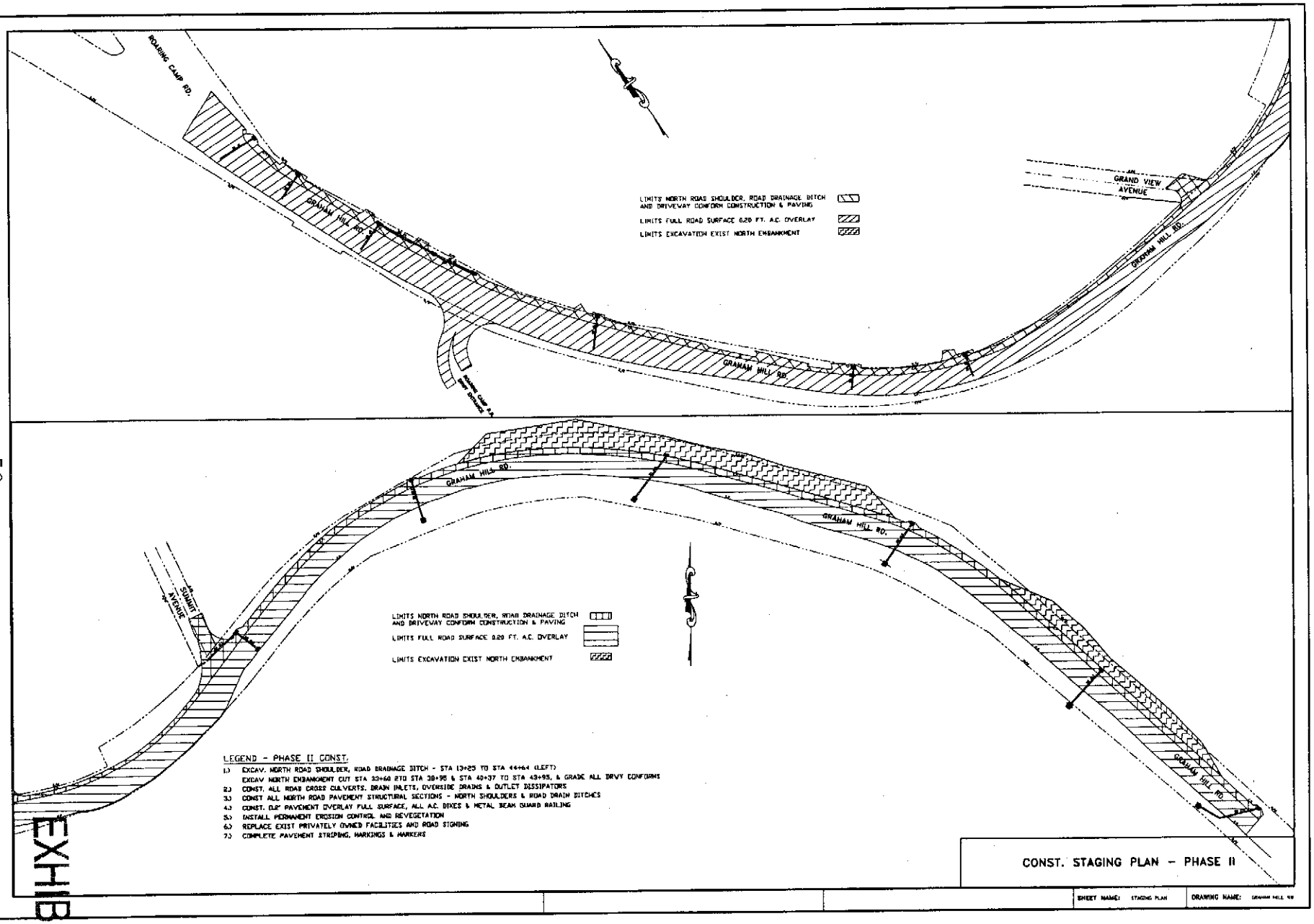
DRAWN: CIV
CHECKED: SBW
DATE: 02/09
SCALE: 1" = 200'
JOB NO. 40265
SHEET 42 OF

EXHIBIT A

EXHIBIT A



COUNTY OF SANTA CRUZ - DEPARTMENT OF PUBLIC WORKS		PROJECT ENGINEER		DATE	REVISION	BY
GRAHAM HILL RD. IMPROVEMENT PROJECT ROARING CAMP RD. - 0.61 MILES EAST		C. VESTER				
DRAWING: CIV	CHECKED: SBW	DATE: 02/09	SCALE: 1" = 80'	JOB NO. 40265	SHEET 43 OF	



LEGEND - PHASE II CONST.

1.) EXCAV. NORTH ROAD SHOULDER, ROAD DRAINAGE DITCH - STA 13+25 TO STA 44+64 (LEFT)
EXCAV. NORTH EMBANKMENT CUT STA 32+60 TO STA 38+95 & STA 40+37 TO STA 43+95, & GRADE ALL DRVY CONFORMS
2.) CONST. ALL ROAD CROSS CULVERTS, DRAIN INLETS, OVERSIDE DRAINS & OUTLET DISSIPATORS
3.) CONST ALL NORTH ROAD PAVEMENT STRUCTURAL SECTIONS - NORTH SHOULDERS & ROAD DRAIN DITCHES
4.) CONST. 0.2' PAVEMENT OVERLAY FULL SURFACE, ALL A.C. DIKES & METAL BEAM GUARD RAILING
5.) INSTALL PERMANENT EROSION CONTROL AND REVEGETATION
6.) REPLACE EXIST PRIVATELY OWNED FACILITIES AND ROAD SIGNING
7.) COMPLETE PAVEMENT STRIPING, MARKINGS & MARKERS

CONST. STAGING PLAN - PHASE II

SHEET NAME: STAGING PLAN | DRAWING NAME: GRAHAM HILL RD

BY	REVISION	DATE

COUNTY OF SANTA CRUZ -- DEPARTMENT OF PUBLIC WORKS

GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. - 0.61 MILES EAST

PROJECT ENGINEER: C. VESTER

DRAWN:	CIV
CHECKED:	SBW
DATE:	07/08
SCALE:	1" = 50'
JOB NO.	40265
SHEET	44 OF

- 50 -

EXHIBIT A

COUNTY OF SANTA CRUZ - DEPARTMENT OF PUBLIC WORKS

GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. - 0.61 MILES EAST

PROJECT ENGINEER: C. VESTER

DRAWN: CIV
CHECKED: SBW
DATE: 02/09
SCALE: AS SHOWN
JOB NO. 40265
SHEET 45 OF

BY	REVISION	DATE

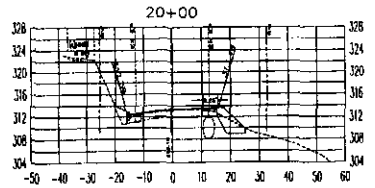
CROSS SECTIONS
STA 12+75 - 18+50

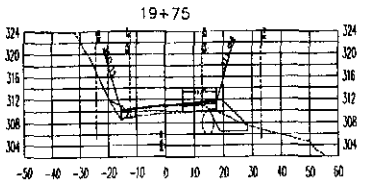
SHEET NAME: DRAWING NAME:

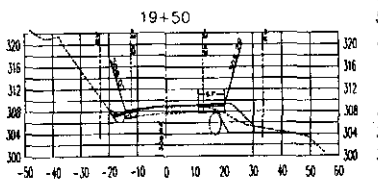
SCALE HORIZ: 1" = 20'
VERT: 1" = 10'

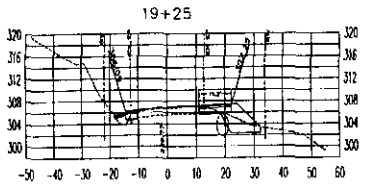
18+50 18+25 18+00 17+75 17+50 17+25 17+00 16+75 16+50 16+25 16+00 15+75 15+50 15+25 15+00 14+75 14+50 14+25 14+00 13+75 13+50 13+25 13+00 12+75

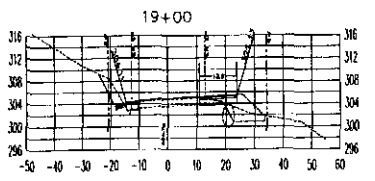
EXHIBIT A

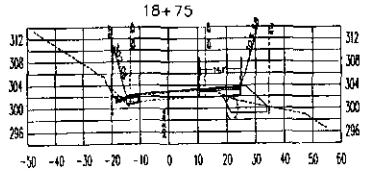


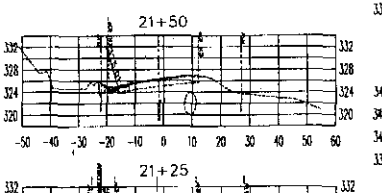


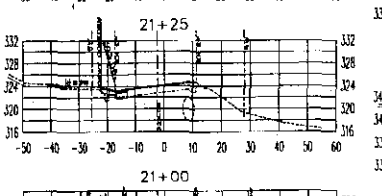


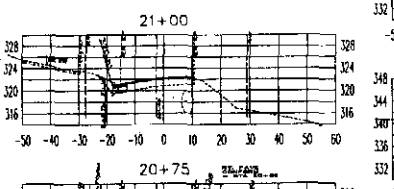


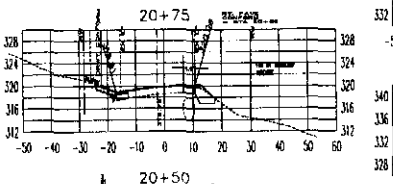


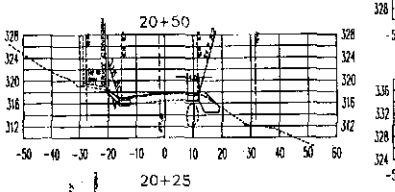


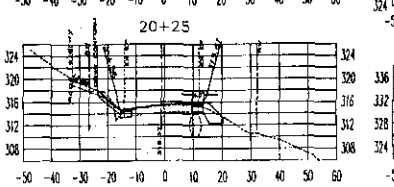


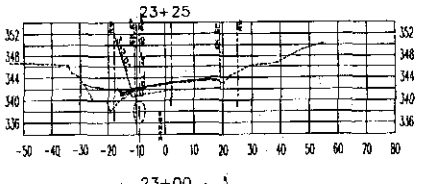


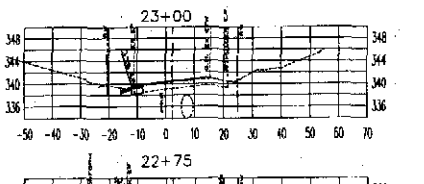


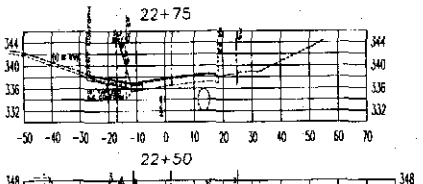


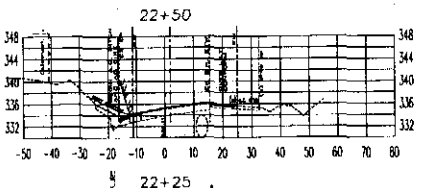


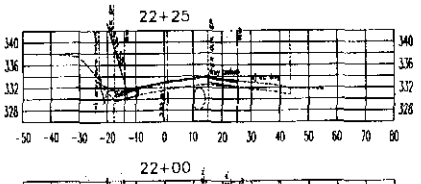


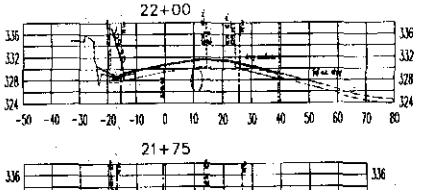


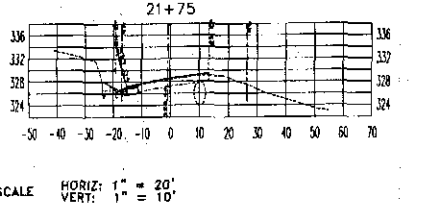


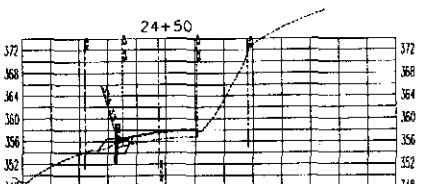


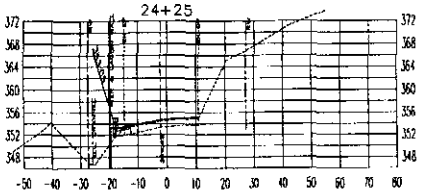


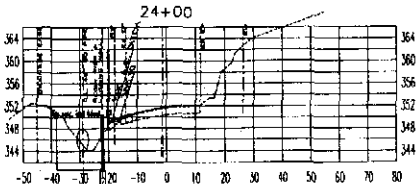


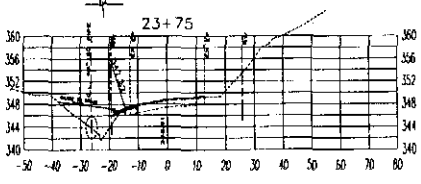


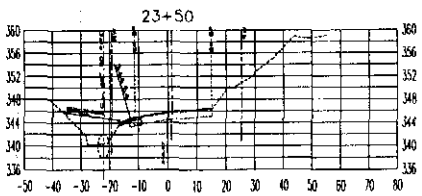












SCALE HORIZ: 1" = 20'
VERT: 1" = 10'

CROSS SECTIONS
STA 18+75 – 24+50

SHEET NAME: x-sections DRAWING NAME: graham hill rd

COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS
GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. – 0.61 MILES EAST

PROJECT ENGINEER: C. VESTER

DRAWN: CIV
CHECKED: SBW
DATE: 02/09
SCALE: AS SHOWN
JOB NO. 40265
SHEET 46 OF

BY | REVISION | DATE

EXHIBIT A

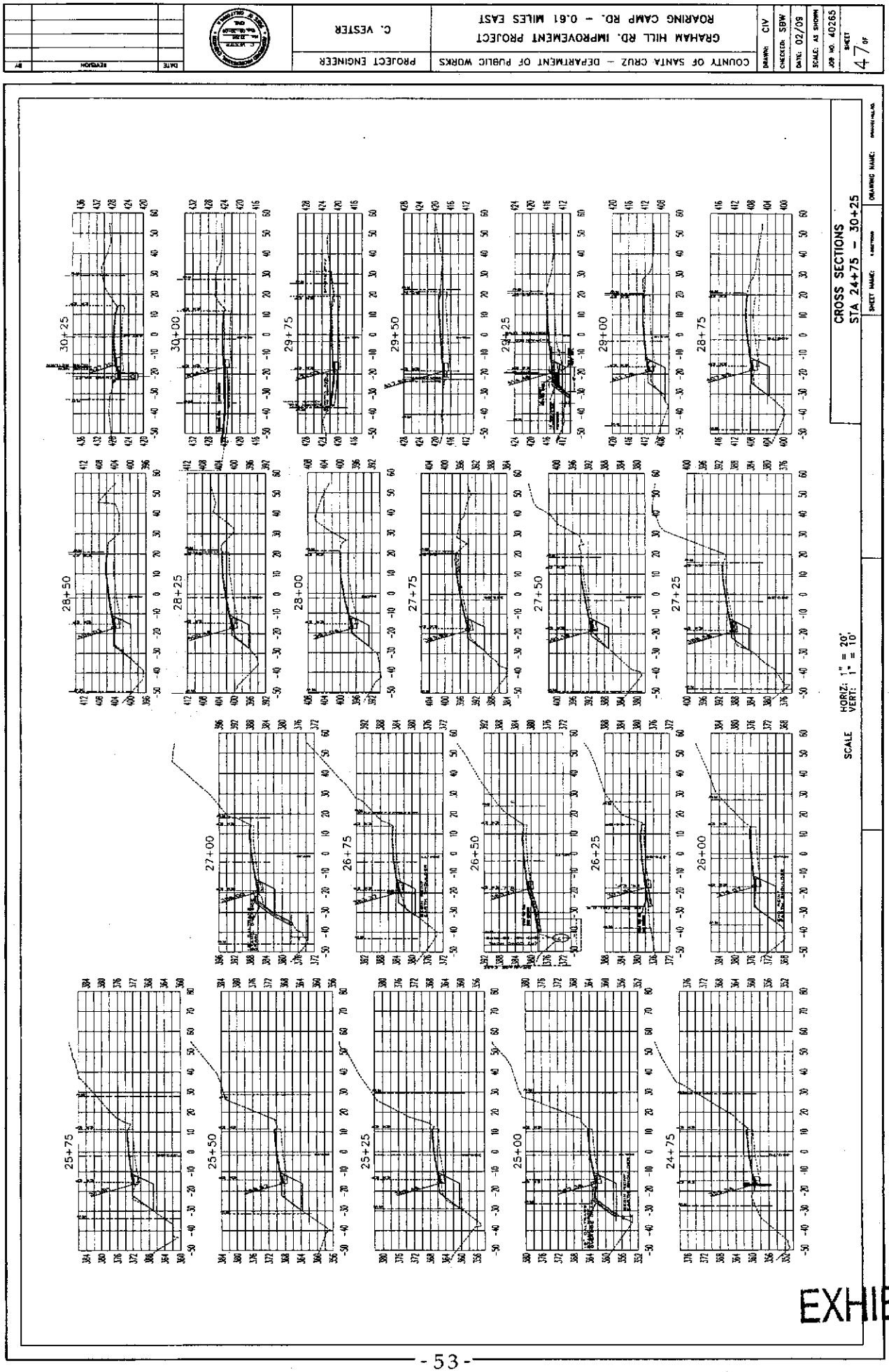

COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS
GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. – 0.61 MILES EAST
PROJECT ENGINEER
C. VESTER
DRAWN: CIV
CHECKED: SBW
DATE: 02/09
SCALE: AS SHOWN
JOB NO. 40265
SHEET 47 OF
CROSS SECTIONS
STA 24+75 – 30+25
SCALE HORIZ. 1" = 20'
VERT. 1" = 10'
30+25
30+00
29+75
29+50
29+25
29+00
28+75
28+50
28+25
28+00
27+75
27+50
27+25
27+00
26+75
26+50
26+25
26+00
25+75
25+50
25+25
25+00
24+75

EXHIBIT A

COUNTY OF SANTA CRUZ - DEPARTMENT OF PUBLIC WORKS
GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. - 0.61 MILES EAST
PROJECT ENGINEER
C. VESTER
DRAWN: CIV
CHECKED: SBW
DATE: 02/09
SCALE: AS SHOWN
JOB NO. 40265
SHEET 48
DATE
REVISION
BY
CROSS SECTIONS
STA 30+50 - 35+25
SCALE HORIZ: 1" = 20'
VERT: 1" = 10'
35+25
35+00
34+75
34+50
34+25
34+00
33+75
33+50
33+25
33+00
32+75
32+50
32+25
32+00
31+75
31+50
31+25
31+00
30+75
30+50

EXHIBIT A

COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS	DRAWN: CIV
GRAHAM HILL RD. IMPROVEMENT PROJECT	CHECKED: SSW
ROARING CAMP RD. – 0.61 MILES EAST	DATE: 02/09
PROJECT ENGINEER: C. VESTER	SCALE: AS SHOWN
	JOB NO. 40265
	SHEET 49 OF

DATE	REVISION	BY

CROSS SECTIONS
STA 35+50 – 38+25

SHEET NAME: DRAWING NAME:

SCALE HORIZ: 1" = 20'
VERT: 1" = 10'

EXHIBIT A

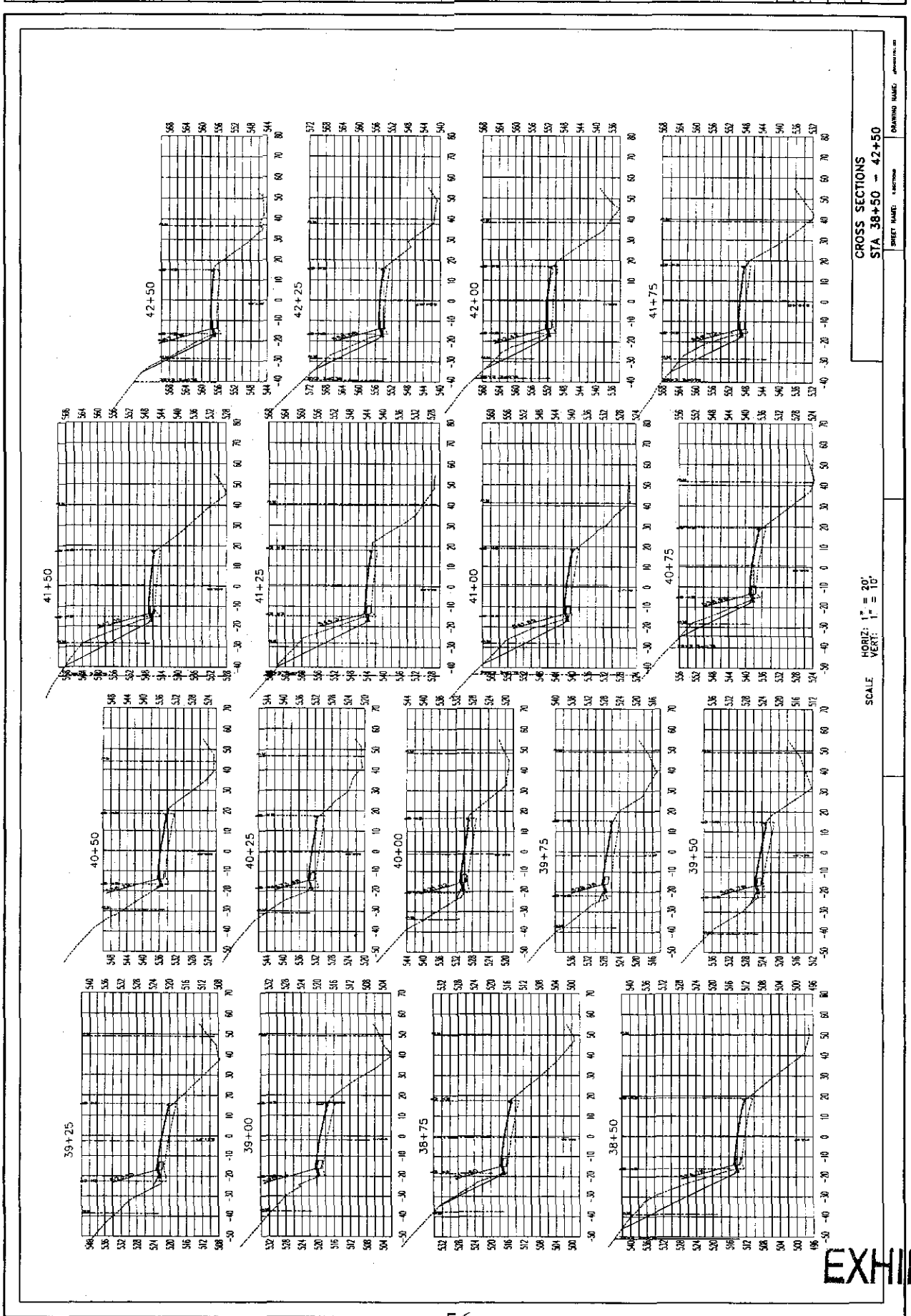

COUNTY OF SANTA CRUZ - DEPARTMENT OF PUBLIC WORKS
GRAHAM HILL RD. IMPROVEMENT PROJECT
ROARING CAMP RD. - 0.61 MILES EAST
PROJECT ENGINEER
C. YESTER
DRAWN: CIV
CHECKED: SBW
DATE: 02/09
SCALE: AS SHOWN
JOB NO. 40265
SHEET 50 OF
CROSS SECTIONS
STA 38+50 - 42+50
SCALE HORIZ: 1" = 20'
VERT: 1" = 10'
42+50
42+25
42+00
41+75
41+50
41+25
41+00
40+75
40+50
40+25
40+00
39+75
39+50
39+25
39+00
38+75
38+50

EXHIBIT A

COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS	DRAWN: CIV
GRAHAM HILL RD. IMPROVEMENT PROJECT	CHECKED: SBW
ROARING CAMP RD. – 0.61 MILES EAST	DATE: 02/09
PROJECT ENGINEER: C. VESTER	SCALE: AS SHOWN
	JOB NO. 40265
	SHEET 51 OF

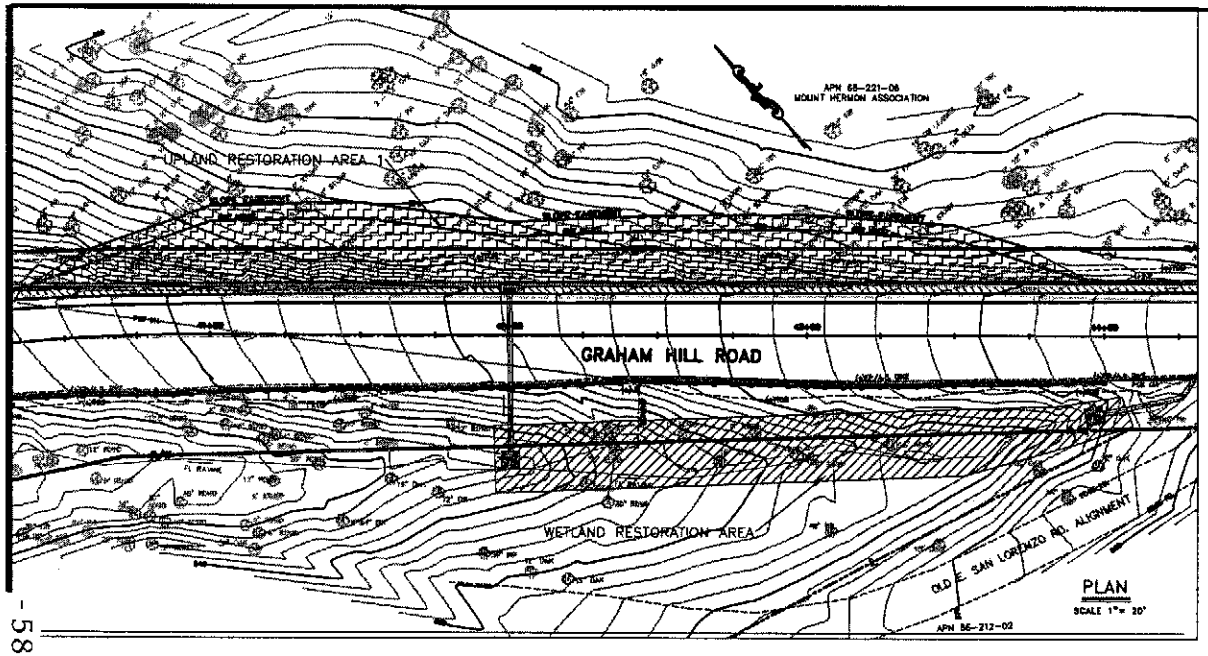
BY	REVISION	DATE

CROSS SECTIONS
STA 42+75 – 44+50

SHEET NAME: | DRAWING NAME:

SCALE HORIZ: 1" = 20'
VERT: 1" = 10'

EXHIBIT A



WETLAND RESTORATION

WETLAND RESTORATION AREA (3:1 RATIO / 4,400 sq.ft.)
(Mitigation for wetland habitat)
Riparian/Wetland area shall be planted with native vegetation.
Plants to be located and flagged in the field prior to installation.
See plant list for species and quanity. Work to include the removal of non-native invasive plant species.

WETLAND PLANT LIST

SYMBOL	SIZE	QUANITY	BOTANICAL NAME - COMMON NAME / SPACING
	TREES		
SA	Cuttings	100	Salix - Arroyo Willow / 3' o.c.
PB	Treepot 1	12	Populus balsamifera ssp. trichocarpha - Cottonwood / 12' o.c.
CC	Treepot 1	12	Cornus Californica - Creek Dogwood / 12' o.c.
UC	Treepot 1	12	Umbellularia californica - California Bay / 12' o.c.
AM	Treepot 1	12	Acer macrophyllum - Big Leaf Maple / 12' o.c.
	UNDERSTORY		
JR	Deepot	80	Juncus patens - Rush / 3' o.c.
EA	Deepot	40	Equisetum arvense - Horsetail / 3' o.c.
PM	Deepot	25	Polystichum munitum - Sword Fern / 3' o.c.
SS	Deepot	25	Symphoricarpos sp. - Snowberry / 3' o.c.

UPLAND RESTROATION 1

UPLAND REVEGETATION AREA 1 (7,359 sq. ft.)
Upland area shall be planted with native vegetation.
Plants to be located and flagged in the field prior to installation.
See plant list for species and quanity.

UPLAND AREA 1 PLANT LIST (Mitigation for Mount Hermon June Beetles)

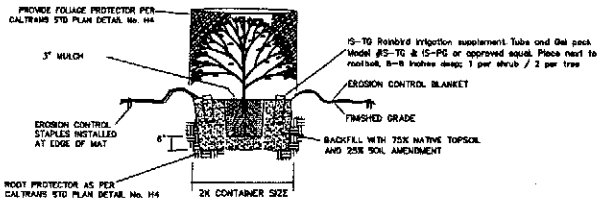
SYMBOL	SIZE	QUANITY	BOTANICAL NAME - COMMON NAME / SPACING
	TREES		
UC	Treepot 1	5	Umbellularia californica - California Bay / 12' o.c.
SS	Treepot 1	10	Sequoia sempervirens - Coast Redwood / 12' o.c.
PM	Treepot 1	5	Pseudostuga menziesii - Douglas Fir / 12' o.c.
QA	Treepot 1	5	Quercus agrifolia - Coast Live Oak / 12' o.c.
AC	Treepot 1	10	Aesculus californica - Buckeye / 10' o.c.
AM	Treepot 1	5	Acer macrophyllum - Big Leaf Maple / 12' o.c.

ALL AREAS DISTURBED DURING CONTRUCTION
EROSION CONTROL SEED MIXTURE (54 lbs./acre)

10 lbs. Elymus glaucus - Blue Wildrye
10 lbs. Bromus carinatus - California Brome
15 lbs. Hordeum branchyantherum - Meadow Barley
10 lbs. Festuca californica - California Fescue
6 lbs. Lupinus bicolor - Legume seed-pellet inoculated
3 lbs. Eschscholtzia californica - California Poppy

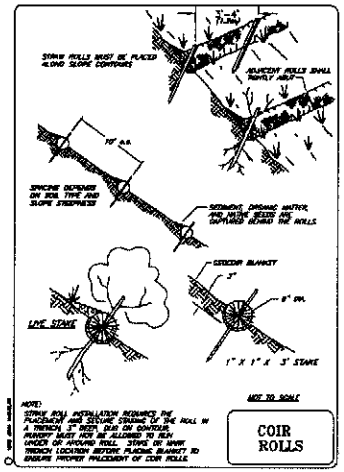
NOTES

1. ACTIVE WORK ZONE, ALL EXPOSED SOIL, AND OTHER POTENTIAL EROSION AREAS SHALL BE TEMPORARILY COVERED IN CLEAR PLASTIC AS NEEDED OR AS DIRECTED BY ENGINEER DURING WINTER CONSTRUCTION ACTIVITY.
2. REVEGETATION AREA PLANTING TO BE COMPLETED IN THE FALL AFTER CONSTRUCTION IS COMPLETED.
3. LIMITS OF WORK ARE APPROXIMATE AND SHALL BE VERIFIED IN FIELD.
4. ALL NEW PLANTS, EXCEPT FOR LIVE CUTTINGS, SHALL HAVE CAGES AND ROOT PROTECTORS TO PROTECT THEM FROM BROWSING ANIMALS.
5. LOCATIONS FOR NEW PLANTS IN THE PROJECT SHALL BE FLAGGED BY THE CONTRACTOR AND APPROVED BY THE COUNTY'S LANDSCAPE ARCHITECT AFTER FINAL GRADING IS COMPLETE.
6. TO PREVENT EROSION DO NOT REMOVE AND/OR PROTECT AS MANY EXISTING PLANTS ON SITE AS POSSIBLE.



SHRUB/TREE PLANTING
N.T.S.

NOTES
1. INSTALL PLANTS PER CALTRANS STD PLAN H4 AND SPECIFICATIONS.
2. EXACT LOCATION OF PLANTS TO BE DETERMINED IN THE FIELD.



COIR ROLL INSTALLATION

ALL EXPOSED SOIL DISTURBED BY CONSTRUCTION WITH A SLOPE OF 2:1 OR GREATER SHALL HAVE BLANKET AND STRAW ROLLS INSTALLED.

COIR ROLLS

INSTALL PER MANUFACTURES SPECIFICATIONS.
THIS INCLUDES THE FOLLOWING: PREPARE THE SLOPE BEFORE THE INSTALLATION PROCEDURE IS STARTED. DIG 3-INCH DEEP TRENCHES ACROSS THE SLOPE ON CONTOUR TO PLACE THE ROLLS IN. START BUILDING TRENCHES FROM THE BOTTOM OF THE SLOPE AND WORK UP. CONSTRUCT TRENCHES AT CONTOUR INTERVALS OF 10 FEET APART.

MARK TRENCH LOCATION PRIOR TO INSTALLATION OF COIR ROLLS AND PRIOR TO HYDROSEEDING AND INSTALLATION OF EROSION CONTROL BLANKET (SEE HYDROSEEDING AND EROSION CONTROL BLANKET NOTES AND DETAIL FOR INSTALLATION METHODS). MARKING OF TRENCH LOCATION SHALL BE IN SUCH A WAY THAT THE CONTRACTOR CAN EASILY FIND THE TRENCH LOCATION AFTER THE BLANKET HAS BEEN INSTALLED. TRENCH SHALL BE MARKED WITH FLAGGING OR WOOD STAKES AT INTERVALS OF 10' O.C.

INSTALL COIR ROLL AFTER HYDROSEEDING AND EROSION CONTROL BLANKET IS INSTALLED. MAKE SURE NO GAPS EXIST BETWEEN THE SOIL, EROSION CONTROL BLANKET AND THE COIR ROLL. USE A STRAIGHT BAR TO DRIVE HOLES THROUGH THE MATTLE AND INTO THE SOIL FOR THE POLE CUTTING OR WOODEN STAKES. DRIVE THE STAKE THROUGH PREPARED HOLE INTO THE SOIL. LEAVE ONLY 1-2 INCHES OF STAKE EXPOSED ABOVE ROLL. INSTALL STAKES 3 FEET APART.

REVEGETATION PLAN

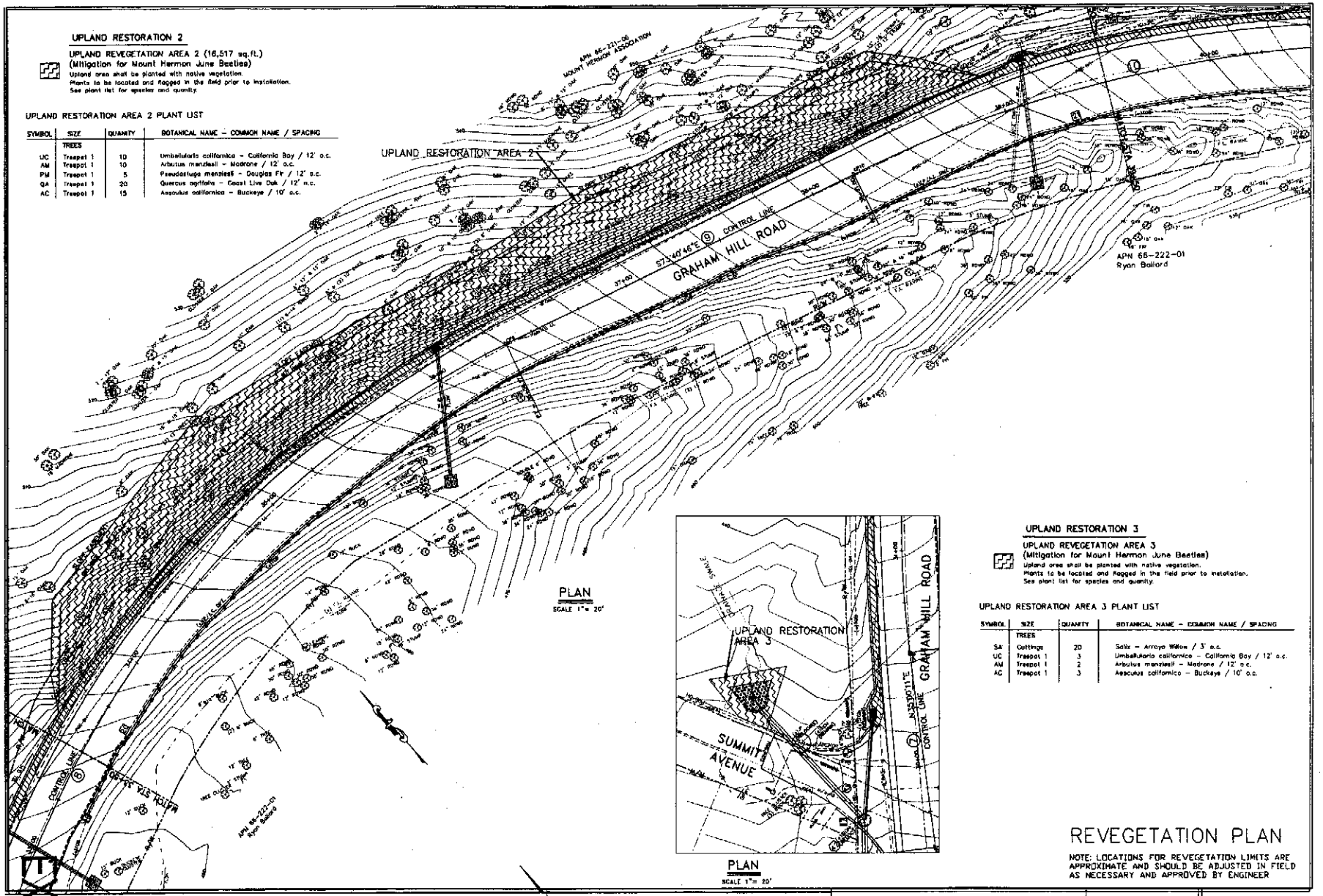
NOTE: LOCATIONS FOR REVEGETATION LIMITS ARE APPROXIMATE AND SHOULD BE ADJUSTED IN FIELD AS NECESSARY AND APPROVED BY ENGINEER

SHEET NAME:	ROAD IMPROVEMENTS
DRAWING NAME:	GRAHAM HILL RD.

DATE	REVISION	BY
7/09	WETLAND RESTORATION	CS

COUNTY OF SANTA CRUZ - DEPARTMENT OF PUBLIC WORKS
PROJECT ENGINEER: C. VESTER
GRAHAM HILL ROAD IMPROVEMENT PROJECT
ROARING CAMP RD. - 0.61 MILES EAST

DRAWN:	CS
CHECKED:	SBW
DATE:	10/08
SCALE:	AS SHOWN
JOB NO.	40265
SHEET	L1 OF 4

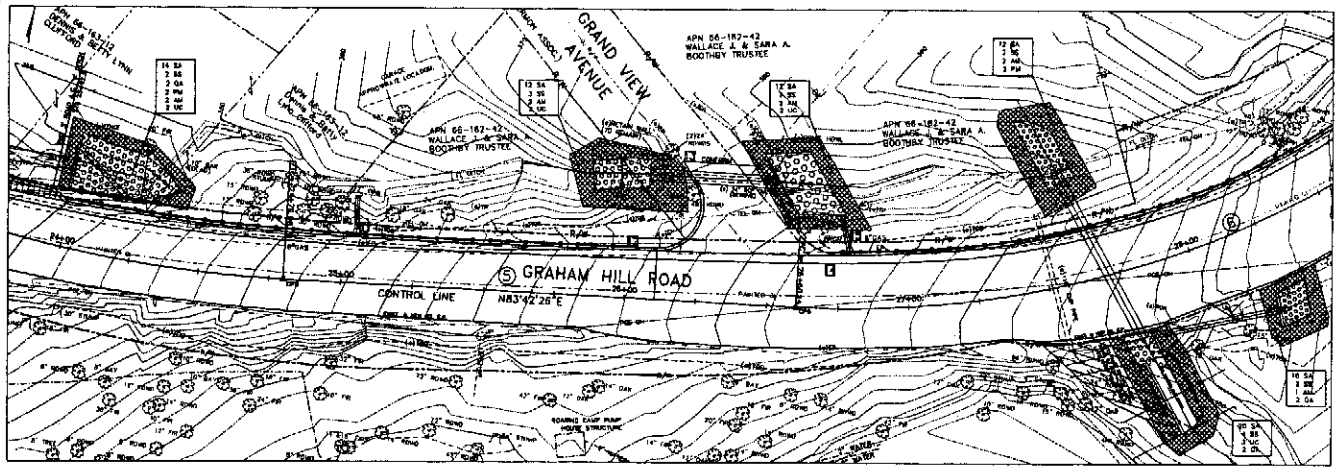


BY | REVISION | DATE

COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS
GRAHAM HILL ROAD IMPROVEMENT PROJECT
ROARING CAMP RD. – 0.61 MILES EAST
PROJECT ENGINEER: C. VESTER

DRAWN: CS
CHECKED: SBW
DATE: 10/08
SCALE: AS SHOWN
JOB NO. 40265
SHEET: L2 of 4

EXHIBIT A



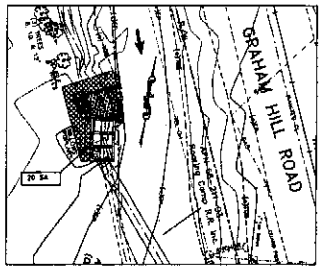
PLAN
SCALE 1"= 20'

REVEGETATION

REVEGETATION AREA
Upland area shall be planted with native vegetation.
Plants to be located and flagged in the field prior to installation.
See plant list for species and quantity.

REVEGETATION PLANT LIST

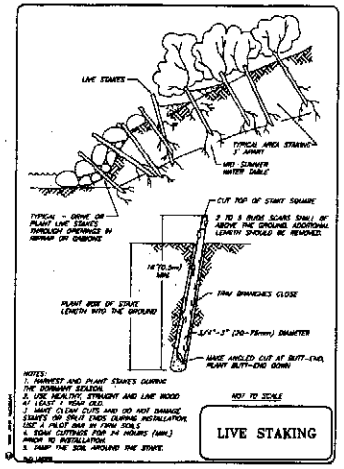
SYMBOL	SIZE	QUANITY	BOTANICAL NAME – COMMON NAME / SPACING
	TREES		
SA	Cuttings	100	Salix – Arroyo Willow / 3' o.c. (stakes in straw rolls)
UC	Treepot 1	9	Umbellularia californica – California Bay / 12' o.c.
SS	Treepot 1	15	Sequoia sempervirens – Coast Redwood / 12' o.c.
PM	Treepot 1	4	Pseudotsuga menziesii – Douglas Fir / 12' o.c.
QA	Treepot 1	5	Quercus agrifolia – Coast Live Oak / 12' o.c.
AM	Treepot 1	9	Acer macrophyllum – Big Leaf Maple / 12' o.c.



PLAN
SCALE 1"= 20'

LIVE STAKING

Construction Specifications:
Harvesting:
– Stakes shall be harvested and planted when the willows, or other chosen species, are dormant. This period is generally from late fall to early spring, or before the buds start to break.
– When harvesting cuttings, select healthy, live wood that is reasonably straight.
– Use live wood of latest 1 year old or older. Avoid suckers of current years growth as they lack sufficient stored energy reserves to sprout consistently. The best wood is 2–5 years old with smooth bark that is not deeply furrowed.
– Make clean cuts with unsplit ends. Trim branches from cutting as close as possible. The butt end of the cutting shall be pointed or angled and the top end shall be cut square.
– Identification of the top and bottom of cutting as accomplished by angle cutting the butt end. The top square cut can be painted and sealed by dipping the top 1–2 inches (25–51 mm) into a 50–50 mix of light colored latex paint and water. Sealing the top of stake will reduce the possibility of desiccation and disease caused mortality, assure the stakes are planted with the top up, and makes the stakes more visible for subsequent planting evaluations.
Diameter:
– Cuttings should generally be 3/4 inch (19 mm) or larger depending on the species. Highest survival rates are obtained from using cuttings 2–3 inches (51–76 mm) in diameter. Larger diameter cuttings are needed for planting into rock riprap.
Length:
– Cuttings of small diameter (up to 1–1/2 inches (38 mm)) shall be 18 inches (0.5 m) long minimum. Thicker cuttings should be longer. Cuttings should be long enough to reach into the midsummer water table, if possible.
– No less than 1/2 total length must be into the ground. – Stakes should be cut so that a terminal bud scar is within 1–4 inches (25–101 mm) of the top. At least 2 buds and/or bud scars shall be above the ground after planting.
Installation:
– Stakes must be planted with butt–ends into the ground. Leaf bud scars or emerging buds should always point up.
– Stakes must not be allowed to dry out. All cuttings should be soaked in water for a minimum of 24 hours. Soaking significantly increases the survival rate of the cuttings, however they may be planted the same day they are harvested.
– Plant stakes 0.81 m (3 feet) on center.
– Set the stake as deep as possible into the soil, preferably with 80 percent of its length into the soil and in contact with midsummer water table.
– It is essential to have good contact between the stake and soil for roots to sprout. Tamp the soil around the cutting.
– Do not damage the buds, strip the bark or split the stake during installation.
– Split or damaged stakes shall be removed and replaced. Inspection and Maintenance:
– Periodic inspection repair and maintenance will be required during the first two years or until the vegetation is established.



LIVE STAKING

EROSION CONTROL NOTES

1. ALL OPERATIONS SHALL CONFORM TO REQUIREMENTS OF THE COUNTY EROSION CONTROL ORDINANCE. THE DESIRED END RESULT OF THE PROPOSED MEASURE IS TO CONTROL SITE EROSION AND TO PREVENT SEDIMENT TRANSPORT OFF THE SITE. IT IS THE CONTRACTORS RESPONSIBILITY TO SEE THAT ANY ADDITIONAL MEASURES TO MEET THIS GOAL ARE BEING MET. SILT FENCES AND SAND BAGS SHALL BE USED TO PREVENT SILT RUNOFF.
2. DISTURBANCE TO NATURAL VEGETATION SHALL BE MINIMIZED WITHIN AREA OF CONSTRUCTION.
3. BETWEEN OCTOBER 15 AND APRIL 15, EXPOSED SOIL SHALL BE PROTECTED FROM EROSION AT ALL TIMES. DURING CONSTRUCTION SUCH PROTECTION SHALL CONSIST OF MULCHING AND/OR PLANTING OF NATIVE VEGETATION AS DIRECTED BY THE DEPARTMENT'S LANDSCAPE ARCHITECT. BEFORE COMPLETION OF THIS PROJECT, ANY EXPOSED SOIL ON DISTURBED SLOPES SHALL BE PERMANENTLY PROTECTED FROM EROSION.
4. SLOPE STABILIZATION SHALL CONSIST OF:
   A) REMOVAL OF ALL VEGETATIVE DEBRIS FROM SLOPE.
   B) HANDRAKING TO SMOOTH OUT THE DIRT SURFACE OF THE SLOPE.
   C) SEEDING THE ENTIRE SLOPE WITH AN APPROVED GRASS SEED MIXTURE.
   D) PLACING EROSION CONTROL BLANKET OVER THE SEEDED AREAS ON ALL SLOPES GREATER THAN 20%. ALL BLANKETS SHALL BE SECURED WITH HEAVY GAUGE WIRE STAPLES.
   E) ALL SEEDED AND MULCHED AREAS SHALL BE CAT-TRACKED PRIOR TO THE PLACEMENT OF EROSION CONTROL BLANKETS.
5. ANY EXCESS MATERIAL SHALL BE DISPOSED OF OFF-SITE OR STOCKPILED IN A MANNER TO AVOID RUNOFF ONTO ADJOINING PROPERTIES.
6. ANY MATERIAL STOCKPILED DURING CONSTRUCTION SHALL BE COVERED WITH PLASTIC.
7. CONTRACTOR SHALL NOTIFY THE COUNTY OF SANTA CRUZ EROSION CONTROL/GRADING DIVISION, (454-3168) AT LEAST 72 HOURS BEFORE ANY EARTHWORK IS BEGUN.
8. EARTHWORK BETWEEN OCTOBER 15 AND APRIL 15 IS PROHIBITED UNLESS A WINTER GRADING PERMIT HAS BEEN ISSUED BY THE PLANNING DEPARTMENT (CALL TELEPHONE NUMBER (831) 454-3114).

NOTE:
TEMPORARY STOCK PILING OF SUITABLE MATERIAL FROM EXCAVATION SHALL OCCUR IN THE DESIGNATED STAGING AREA. ALL UNSUITABLE EXCAVATED MATERIAL SHALL BE DISPOSED OF ON A DAILY BASIS AS DIRECTED AND APPROVED BY THE ENGINEER.

TREE PROTECTION NOTES

1. PROTECT ROOT COLLAR FROM DAMAGE BY GRADING EQUIPMENT OR BUILDING MATERIALS TO BE STACKED OR STORED UNDER DRIP LINE OF TREES.
2. PLACE PROTECTIVE (CONSTRUCTION) FENCING AROUND TREE, UNDER THE DRIP LINE OR ON THE OUTERMOST EDGE OF THE PROJECT CONSTRUCTION LIMITS. FENCING SHOULD BE INSTALLED PRIOR TO CONSTRUCTION AND THE LOCATION APPROVED BY BOTH THE CONTRACTOR AND THE COUNTY'S LANDSCAPE ARCHITECT. INSTALL STRAW BALES AROUND THE TREE AS NECESSARY TO PREVENT SOIL BUILD UP. THE PROTECTIVE FENCING SHOULD BE INSTALLED IN SUCH A MANNER THAT IT WILL BE STURDY ENOUGH TO LAST THROUGH THE ANTICIPATED SCHEDULE OF CONSTRUCTION. DO NOT REMOVE FENCING UNTIL PROJECT IS COMPLETED.
3. GRADING UNDER TREE CANOPY IS TO BE LIMITED. ANY TRENCHING OR DIGGING UNDER THE DRIP LINE OF THE TREE SHALL BE DONE BY HAND OR CAREFUL USE OF BACKHOE IN ORDER TO PREVENT THE FRACTURING OF ROOTS.
4. ABOVE GROUND RUNOFF SHALL BE CONTROLLED IN SUCH A WAY THAT IT IS NOT DIVERTED UNDER TREE'S CANOPY.
5. THE CONTRACTOR SHALL, ON AN ON GOING BASIS, VISUALLY INSPECT ALL TREES. IF AT ANY TIME THE TREES APPEAR TO BE UNDER STRESS, IT SHALL BE REPORTED TO THE ENGINEER FOR ACTION.
6. ANY DAMAGE TO EXISTING TREE CROWNS OR ROOT SYSTEMS SHALL BE REPAIRED IMMEDIATELY BY A CERTIFIED ARBORIST. ROOTS EXPOSED/DAMAGED DURING ON-GOING OPERATIONS SHALL IMMEDIATELY BE CUT OFF CLEANLY INSIDE THE EXPOSED OR DAMAGED AREA AND HAVE TOPSOIL SPREAD OVER THE EXPOSED AREA.
7. THE CONTRACTOR SHALL EMPLOY (AND BE STATE WITH THE LIST OF SUBCONTRACTORS) A CERTIFIED ARBORIST TO BE RESPONSIBLE FOR THE ABOVE WORK AND ACT AS THE CONTACT PERSON FOR ALL MITIGATION DONE BY THE CONTRACTOR FOR THIS PROJECT. THE ARBORIST SHALL BE APPROVED BY THE COUNTY PRIOR TO AWARD OF CONTRACT.
8. ANY TREES REMOVED AT THIS PROJECT SITE SHALL BE REPLACED BY THREE 15 GALLON SPECIMENS UNLESS APPROVED BY THE COUNTY RESOURCE PLANNER.
9. PRIOR TO CLEARING AND GRUBBING LIMITS OF DISTURBANCE SHALL BE STAKED AND FENCED. ANY FURTHER MEASURES OF TREE PROTECTION SHALL BE INSTALLED AS NECESSARY AT THE DIRECTION OF THE ENGINEER.

REVEGETATION PLAN

NOTE: LOCATIONS FOR REVEGETATION LIMITS ARE APPROXIMATE AND SHOULD BE ADJUSTED IN FIELD AS NECESSARY AND APPROVED BY ENGINEER

SHEET NAME: ROAD IMPROVEMENTS | DRAWING NAME: GRAHAM HILL RD.

COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS	
PROJECT ENGINEER	C. VESTER
GRAHAM HILL ROAD IMPROVEMENT PROJECT	
ROARING CAMP RD. – 0.61 MILES EAST	
DRAWN: CS	
CHECKED: SBW	
DATE: 10/08	
SCALE: AS SHOWN	
JOB NO. 40265	
SHEET L3 or 4	

REVISION | BY | DATE

EXHIBIT A

- 09 -

PLANTING NOTES

A. GENERAL PLANTING INFORMATION

1. THESE NOTES ARE FOR GENERAL REFERENCE. IN CONJUNCTION WITH, AND AS A SUPPLEMENT TO, THE WRITTEN SPECIFICATION ASSOCIATED WITH THE CONTRACT DOCUMENTS.
2. PRIOR TO PLANT MATERIAL INSTALLATION, LOCATIONS SHALL BE COORDINATED WITH LAYOUT OF UNDERGROUND UTILITIES. THE CONTRACTOR SHALL BE FAMILIAR WITH THE LOCATIONS OF EXISTING AND FUTURE UNDERGROUND SERVICES AND IMPROVEMENTS THAT MAY CONFLICT WITH THE WORK TO BE DONE. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL LOCATIONS OF UNDERGROUND UTILITIES PRIOR TO THE START OF WORK. THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER IMMEDIATELY SHOULD CONFLICTS ARISE.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE SITE IN A SAFE AND CLEAN CONDITION. AT THE END OF EACH DAY THE SITE SHALL BE CLEANED UP AND LEFT IN A CONDITION THAT IS SAFE.

B. NATIVE TOPSOIL

1. SELECT A LOCATION FOR A STABILIZED TEMPORARY STOCKPILE SITE THAT WILL NOT ERODE, BLOCK DRAINAGE, OR INTERFERE WITH WORK WITHIN THE DESIGNATED STAGING AREA.
2. STRIP TOPSOIL ONLY FROM THOSE AREAS THAT WILL BE DISRUPTED BY EXCAVATION, FILLING, ROAD BUILDING, OR COMPACTING BY EQUIPMENT. A 4–6" (102–150mm) STRIPPING DEPTH IS COMMON, BUT DEPTH VARIES DEPENDING ON THE SITE. STORE AT STOCKPILE SITE.
3. PROTECT TOPSOIL STOCKPILES BY TEMPORARILY COVERING WITH PLASTIC AS SOON AS POSSIBLE TO ASSURE THE STORED MATERIAL IS NOT EXPOSED AND ALLOWED TO ERODE. INSTALL SILT FENCE AROUND STOCKPILES TO CONTROL SEDIMENTATION INTO THE STREAM.
4. WHEN THE CONSTRUCTION PROJECT IS COMPLETED AND BEFORE PLANTING OPERATIONS AND SEEDING BEGIN, SCARIFY THE SUBSOIL TO A MINIMUM DEPTH OF 3" (76mm). UNIFORMLY DISTRIBUTE TOPSOIL TO A MINIMUM, LIGHTLY COMPACTED DEPTH OF 4" (51mm) ON 1V:3H (3:1) SLOPES AND 6" (150mm) ON FLATTER SLOPES.
5. DO NOT SPREAD TOPSOIL WHILE IT IS FROZEN OR MUDDY OR WHEN THE SUBGRADE IS WET OR FROZEN. CORRECT ANY IRREGULARITIES IN THE SURFACE THAT RESULT FROM TOPSOILING OR OTHER OPERATIONS TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS. COMPACT THE TOPSOIL ENOUGH TO ENSURE GOOD CONTACT WITH THE UNDERLYING SOIL, BUT AVOID EXCESSIVE COMPACTING, AS IT INCREASES RUNOFF AND INHIBITS SEED GERMINATION.

C. PLANTING OPERATIONS

1. PLANTING OPERATIONS SHALL BE COMPLETED IN STRICT ACCORDANCE WITH SPECIFICATIONS AND DETAILS FOR SITE PREPARATION AND PLANTING.
2. THE LOCATIONS OF REVEGETATION ELEMENTS ARE FOR PLANNING PURPOSES ONLY AND MAY BE ADJUSTED IN THE FIELD AT THE DIRECTION OF THE ENGINEER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL TAKE CARE TO LOCATE PLANT MATERIALS TO OPTIMUM GROWTH CONDITIONS AND MAXIMUM AESTHETICS. PLANT MATERIAL SHALL NOT BE INSTALLED SO AS TO OBSTRUCT DRAINAGE PATTERNS OR HARM EXISTING PLANT MATERIAL. THE CONTRACTOR SHALL NOTIFY THE ENGINEER SHOULD CONFLICTS OCCUR.
3. PRIOR TO SITE WORK FOR THE INSTALLATION OF THE CONTAINER STOCK, THE CONTRACTOR SHALL LAYOUT PLANT MATERIALS, WHILE STILL IN CONTAINERS OR AS FLAGGED LOCATIONS IN THE FIELD. THE ENGINEER SHALL REVIEW AND APPROVE ALL PLANTING LOCATIONS PRIOR TO SITE WORK.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPLYING PLANTS OF THE SPECIES AND SIZE SPECIFIED AND DELIVERY OF THE PLANT MATERIAL TO THE SITE. THE ENGINEER SHALL REVIEW AND APPROVE ALL PLANT MATERIALS, PRIOR TO THEIR INSTALLATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REPLACEMENT OF PLANT MATERIAL IF SAID MATERIAL IS IN POOR CONDITION AND REJECTED BY THE ENGINEER.
5. THE CONTRACTOR SHALL ENSURE THAT ALL PLANTS ARE TRUE TO NAME, WITH ONE PLANT IN EACH BUNDLE OR LOT TAGGED WITH THE BOTANICAL NAME AND PLANT SIZE, IN ACCORDANCE TO THE STANDARDS OF PRACTICE RECOMMENDED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
6. ALL PLANTS SHALL BE THE GENUS AND SPECIES AND SIZES SHOWN ON THE PLANS. UNDER NO CONDITIONS WILL THERE BE ANY SUBSTITUTION OF PLANTS OR SIZES, EXCEPT WITH THE EXPRESS WRITTEN CONSENT OF THE ENGINEER.
7. EXISTING VEGETATION THAT IS NOT WITHIN THE LIMITS OF THE PROJECT AREA SHALL NOT BE CUT, REMOVED OR OTHERWISE DISTURBED, EXCEPT FOR OCCURRENCES OF INVASIVE, NON-NATIVE PLANT SPECIES.
8. LIVE CUTTINGS SHALL BE INSTALLED AS SHOWN ON PLANTING PLAN AND SHALL BE ADJUSTED IN THE FIELD AS NECESSARY. LIVE CUTTINGS TO BE INSTALLED IN WETLAND RESTORATION AREA AND STRAW ROLLS. LIVE CUTTINGS TO BE INSTALLED AFTER THE PROJECT IS FINISHED SHALL FOLLOW LIVE STAKING INSTALLATION METHODS (INSTALLATION BETWEEN DECEMBER–JANUARY).

D. SEEDING NOTES

1. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE APPLICATION OF SEED ON ALL DISTURBED SOIL AREAS (SEE PLANTING PLAN FOR SEED MIX). SUBMIT 4–OUNCE SAMPLE OF SEED MIX TO ENGINEER WITH CERTIFICATION. SEED CAN BE OBTAINED FROM PACIFIC COAST SEED, LIVERMORE, CA (510) 373–6417, OR APPROVED EQUAL.
2. SEEDING OPERATIONS SHALL BE APPLIED BY HYDROSEEDING AND COMPLETED IN STRICT ACCORDANCE WITH SPECIFICATIONS AND DETAILS FOR SITE PREPARATION AND SEEDING.
3. THE LOCATIONS OF THE SEEDING AREAS ARE FOR PLANNING PURPOSES ONLY AND MAY BE ADJUSTED IN THE FIELD AT THE DIRECTION OF THE ENGINEER PRIOR TO INSTALLATION. THE GENERAL CONTRACTOR SHALL TAKE CARE TO INSTALL SEED AND RELATED MATERIALS TO PROVIDE OPTIMUM GROWTH CONDITIONS AND MAXIMUM AESTHETICS. SEEDED MATERIAL SHALL NOT BE INSTALLED SO AS TO OBSTRUCT DRAINAGE PATTERNS OR HARM EXISTING PLANT MATERIAL. THE GENERAL CONTRACTOR SHALL NOTIFY THE ENGINEER SHOULD CONFLICT OCCUR.
4. PRIOR TO SITE WORK, THE GENERAL CONTRACTOR SHALL FLAG THE BOUNDARIES OF THE SEEDING AREAS, DEMARCATING THE APPLICATION AREA FOR THE SPECIFIED SEED MIXES. THE ENGINEER SHALL REVIEW AND APPROVE ALL SEEDING LOCATIONS PRIOR TO SITE WORK.
5. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPLYING ALL MATERIALS FOR THE SEED APPLICATION, AS SPECIFIED, AND DELIVERY OF THE MATERIALS TO THE SITE. THE ENGINEER SHALL REVIEW AND APPROVE ALL MATERIALS, PRIOR TO THEIR INSTALLATION. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACEMENT OF ANY MATERIAL IF SAID MATERIAL IS NOT AS SPECIFIED AND IS REJECTED BY THE ENGINEER.
6. GENERAL CONTRACTOR SHALL ENSURE THAT ALL SEED ARE TRUE TO NAME, WITH SEED MIXES IDENTIFIED WITH THE BOTANICAL NAME, APPLICATION RATE, PURITY AND GERM, AND THAT THE SEED AND/OR SEED MIX CONTAINS NO NOXIOUS WEEDS.
7. ALL SEEDS SHALL BE THE GENUS AND SPECIES SHOWN ON THE PLANS. UNDER NO CONDITIONS WILL THERE BE ANY SUBSTITUTION OF SPECIES, EXCEPT WITH THE EXPRESS WRITTEN CONSENT OF THE ENGINEER.
8. SEEDING SHALL OCCUR FOLLOWING ALL SITE WORK AND AFTER NATIVE TOPSOIL HAS BEEN SPREAD AND THE SEEDBED HAS BEEN PREPARED.

E. MAINTENANCE NOTES

1. WORK SHALL INCLUDE, BUT IS NOT LIMITED TO, MAINTENANCE OF PLANT MATERIALS, PLANT BASINS, WATERING AND WEEDING NECESSARY TO KEEP THE PLANT MATERIAL IN A HEALTHY, GROWING CONDITION AND KEEP THE PLANTING AREAS NEAT THROUGHOUT THE NINETY (90) DAY MAINTENANCE PERIOD.
2. ALL WEEDS SHALL BE REMOVED FROM THE CONTAINER STOCK PLANTING BASINS THROUGHOUT THE NINETY (90) DAY MAINTENANCE PERIOD. THE WEEDS WILL BE REMOVED IN ORDER TO REDUCE COMPETITION FOR AVAILABLE NUTRIENTS, MOISTURE, AND SUNLIGHT. WEEDS SHALL BE HAND–PULLED. ALL WEED CONTROL SHALL BE DONE IN A MANNER THAT PROTECTS THE INSTALLED PLANTS. WEEDS THAT GROW WITHIN THE PLANTING BASINS SHALL BE CONTROLLED WHEN THEY REACH A HEIGHT OF 4"(102mm) COVER 20% OF THE PLANTING BASIN. WEEDING SHALL CONSIST OF BAGGING AND REMOVAL OF WEED PLANTS FROM THE PROJECT SITE. NO PRE–EMERGENT HERBICIDES SHALL BE ALLOWED.
3. IF INVASIVE, NON–NATIVE PLANT SPECIES ESTABLISH WITHIN THE REVEGETATION AREAS, CONTROLS SHALL BE IMPLEMENTED TO PREVENT THE INFESTATIONS FROM DEVELOPING AND TO FURTHER ENHANCE SURVIVAL OF THE PLANTED SPECIES. HAND REMOVAL SHALL BE UTILIZED TO REMOVE AND CONTROL THE OCCURRENCE OF THESE SPECIES FROM THE PROJECT WORK AREA. INVASIVE, NON–NATIVE SPECIES SHALL BE REMOVED THROUGH HAND HOEING AND HAND PULLING, WITH ALL PLANT MATERIAL BAGGED AND REMOVED FROM THE SITE. HAND HOEING SHALL SEVER THE ROOT A MINIMUM OF 1"(102mm) INCHES BELOW THE GROUND SURFACE. HAND PULLING SHALL REMOVE THE ROOT OF THE PLANT. THE GOAL OF THE MAINTENANCE ACTIONS WILL BE TO REMOVE ALL INVASIVE PLANT SPECIES FROM THE PROJECT AREA PRIOR TO THEIR DEVELOPMENT OF FLOWERING HEADS AND/OR SPREADING INTO THE REVEGETATION AREA.
3. SUPPLEMENTAL WATERING SHALL BE IMPLEMENTED FOR THE CONTAINER STOCK AND LIVE CUTTINGS. PLANTS SHALL BE HAND–WATERED NO LESS THAN TWICE A WEEK DURING THE NINTY (90) DAY MAINTENANCE PERIOD. APPROXIMATELY 1 GALLON OF WATER SHALL BE APPLIED TO EACH PLANT AT EACH WATERING EVENT. EACH WATERING SHALL BE OF SUCH A QUANTITY AS TO PROVIDE OPTIMUM GROWTH CONDITIONS. THIS WORK SHALL INCLUDE WATERING BY HAND FROM WATER TRUCK. THIS SUPPLEMENTAL IRRIGATION SHALL BE CONTINUED UNTIL NATURAL RAINFALL LEVELS REPLENISH SOIL MOISTURE OF THE GROUND.
5. EROSION CONTROL:

   ALL TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE MAINTAINED AND REPAIRED AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION.

   PERIODIC INSPECTION REPAIR AND MAINTENANCE OF THE EROSION CONTROL MEASURES WILL BE REQUIRED DURING THE NINETY (90) DAY MAINTENANCE PERIOD.

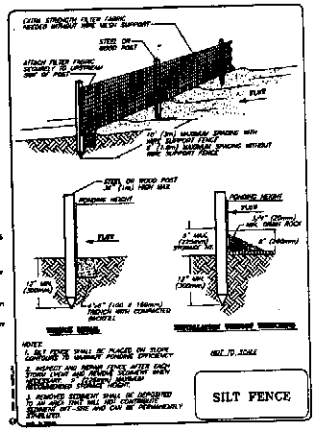
SILT FENCE INSTALLATION

CONSTRUCTION SPECIFICATIONS:

- The height of a silt fence shall not exceed 36 inches (0.9 m). Storage height and ponding height shall never exceed 18 inches (0.5 m).
- The fence line shall follow the contour as closely as possible.
- If possible, the filter fabric shall be cut from a continuous roll to avoid the use of joints. When joints are necessary, filter cloth shall be spliced only at a support post, with a minimum 6 inch (0.2 m) overlap and both ends securely fastened to the post.
- Posts shall be spaced a maximum of 10 feet (3.1 m) apart and driven securely into the ground (minimum of 18 inches (0.5 m)). When extra-strength fabric is used without the wire support fence, post spacing shall not exceed 6 feet (1.8 m).
- Turn the ends of the fence uphill.
- A trench shall be excavated approximately 4 inches (101 mm) wide and 6 inches (0.2 m) deep along the line of posts and upslope from the barrier.
- When standard-strength filter fabric is used, a wire mesh support fence shall be fastened securely to the upslope side of the posts using heavy duty wire stapled at least 1 inch (25.4 mm) long. Wire or hog rings. The wire shall extend into the trench a minimum of 8 inches (0.2 m) and shall not extend more than 36 inches (0.9 m) above the original ground surface.
- The standard-strength filter fabric shall be stapled or wired to the fence, and 6 inches (0.2 m) of the fabric shall extend into the trench. The fabric shall not extend more than 36 inches (0.9 m) above the original ground surface. Filter fabric shall not be stapled to existing trees.
- When extra-strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated. In such a case, the filter fabric is stapled or wired directly to the posts.
- The trench shall be backfilled and the soil compacted over the top of the filter fabric.
- Silt fences placed at the top of a slope shall be set at least 6 feet (1.8 m) from the top in order to increase ponding volume.
- Silt fences shall be removed when they have served their useful purpose, but not before the upslope area has been permanently stabilized and any sediment stored behind the silt fence has been removed.

INSPECTION AND MAINTENANCE:

- Silt fences and filter barriers shall be inspected weekly after each significant storm (1 inch (25.4 mm) in 24 hours). Any required repairs shall be made immediately.
- Sediment should be removed when it reaches 1/2 height of the fence or 6 inches (0.3 m) maximum.
- The removed sediment shall conform with the existing grade and be vegetated or otherwise stabilized.



EROSION CONTROL BLANKET INSTALLATION

CONSTRUCTION SPECIFICATIONS:

Site Preparation

- Proper site preparation is essential to ensure complete contact of the protection netting with the soil.
- Grade and shape area of installation.
- Remove all rocks, clods, vegetative or other obstructions so that the installed blankets or nets will have direct contact with the soil.
- Prepare seedbed by loosening 2–3 inches (50.8–76.2 mm) of topsoil above final grade.
- Incorporate amendments, such as lime and fertilizer, into soil according to soil test and the seeding plan.

Seeding

- Seed area before blanket installation for erosion control and revegetation. Seeding after installation is often specified for turf reinforcement application. When seeding prior to blanket installation, all check slots and other areas disturbed during installation must be reseeded.
- Where seed filling is specified, seed the matting and the entire disturbed area after installation and prior to filling the net with soil.

Anchoring

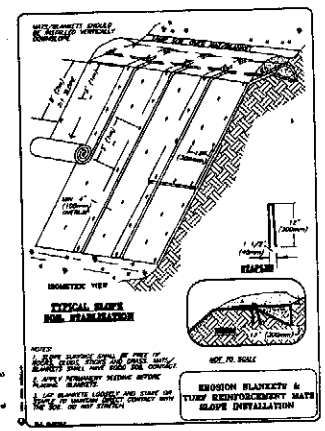
- Un-shaped wire staples, metal geotextile stake pins, or triangular wooden stakes can be used to anchor nets to the ground surface. Wire staples should be a minimum of 11 gauge. Metal stake pins should be 3/16 inch (4.8 mm) diameter steel with a 1 1/2 inch (38.1 mm) steel washer at the head of the pin. Wire staples and metal stakes should be driven flush to the ground surface. All anchors should be 6–8 inches (152–203 mm) long and have sufficient grip penetration to resist pullout. Longer anchors may be required for loose soils.

Installation on Slopes

- Begin at the top of the slope and anchor its blanket in a 6 inch (152 mm) deep x 6 inch (152 mm) wide trench. Backfill trench and tamp earth firmly.
- Unroll blankets downslope in the direction of the creek or streambed.
- The edges of adjacent parallel rolls must be overlapped 2–3 inches (51–76 mm) and be stapled every 3 feet (0.9 m).
- When blankets must be stacked, place blankets end over end (shingle style) with 6 inch (152 mm) overlap. Staple through overlapped area, approximately 12 inches (305 mm) apart.
- Lay blankets loosely and maintain direct contact with the soil – do not stretch.
- Blankets shall be stapled sufficiently to anchor blanket and maintain contact with the soil. Staples shall be placed down the center and staggered with the staples placed along the edges. Steep slopes, 1:1 to 2:1, require 2 staples per square yard (2 staple 3 ft. o.c.). Gentle slopes require 1 staple per square yard.

Installation in channels

- Dig initial anchor trench 12 inches (0.3 m) deep and 6 inches (152 mm) across the channel at the lower end of the project area.



REVEGETATION PLAN

NOTE: LOCATIONS FOR REVEGETATION LIMITS ARE APPROXIMATE AND SHOULD BE ADJUSTED IN FIELD AS NECESSARY AND APPROVED BY ENGINEER

SHEET NAME: ROAD IMPROVEMENTS | DRAWING NAME: GRAHAM HILL RD.

BY | DATE | REVISION

COUNTY OF SANTA CRUZ – DEPARTMENT OF PUBLIC WORKS | PROJECT ENGINEER: C. VESTER

GRAHAM HILL ROAD IMPROVEMENT PROJECT
ROARING CAMP RD. – 0.61 MILES EAST

DRAWN: CS
CHECKED: SBW
DATE: 10/06
SCALE: AS SHOWN
JOB NO. 40265
SHEET: L4 of 4

EXHIBIT A

- 61 -

RIPARIAN EXCEPTION FINDINGS:

1. THAT THERE ARE SPECIAL CIRCUMSTANCES OR CONDITIONS AFFECTING THE PROPERTY.

The property is the right of way and/or easement(s) along Graham Hill Road. The project is improvement to the road itself and the management of drainage on and alongside the road. The position of the road is established and the options for increasing the width are constrained to one side or the other. Where the new culvert and/or fill will encroach into riparian vegetation or existing drainage channel it is because the other side of the road is not a feasible alternative due to topographic constraints or the existing infrastructure.

2. THAT THE EXCEPTION IS NECESSARY FOR THE PROPER DESIGN AND FUNCTION OF SOME PERMITTED OR EXISTING ACTIVITY ON THE PROPERTY.

Graham Hill Road is an existing, heavily traveled public road. The proper management of drainage and the increased width to allow shoulders are necessary for safer functioning of the road and realignment.

3. THAT THE GRANTING OF THE EXCEPTION WILL NOT BE DETRIMENTAL TO THE PUBLIC WELFARE OR INJURIOUS TO OTHER PROPERTY DOWNSTREAM OR IN THE AREA IN WHICH THE PROJECT IS LOCATED

The public welfare will be enhanced by the project, which will increase safety for travelers on the road. Property adjacent to the riparian areas will not be negatively impacted, nor will property downstream. The control of erosion and revegetation of other riparian areas will be a net benefit to adjacent and downstream property.

4. THAT THE GRANTING OF THE EXCEPTION, IN THE COASTAL ZONE, WILL NOT REDUCE OR ADVERSELY IMPACT THE RIPARIAN CORRIDOR, AND THERE IS NO FEASIBLE LESS ENVIRONMENTALLY DAMAGING ALTERNATIVE.

N/A. Project is not in the Coastal Zone.

5. THAT THE GRANTING OF THE EXCEPTION IS IN ACCORDANCE WITH THE PURPOSE OF THIS CHAPTER, AND WITH THE OBJECTIVES OF THE GENERAL PLAN AND ELEMENTS THEREOF, AND THE LOCAL COASTAL PROGRAM LAND USE PLAN.

The exception is in accordance with this Chapter. All riparian vegetation that is removed will be mitigated by 3:1 replacement in a degraded riparian area that is also in the project area. The mitigation area will receive monitoring and maintenance until it is established. Mitigation measures will be undertaken to prevent sedimentation of the corridor while construction is underway. Further, erosion, which is currently occurring, will be controlled by the project and this is a benefit to the riparian area.

EXHIBIT B

Conditions of Approval

Exhibits:

A. Project plans

I. This permit authorizes the construction of roadway improvements. This approval does not confer legal status on any existing structure(s) or existing use(s) on the subject property that are not specifically authorized by this permit. Prior to exercising any rights granted by this permit including, without limitation, any disturbance, the applicant/owner shall:

A. Sign, date, and return to the Planning Department one copy of the approval to indicate acceptance and agreement with the conditions thereof.

B. Conduct preconstruction surveys for raptors, bats, and frogs as specified in the US Fish and Wildlife Service (USFWS) Biological Opinion, the 2004 updated Natural Environmental Study, and the 2009 Addendum to the Biological Assessment (NES).

C. Conduct a preconstruction meeting on site to ensure that all parties are aware of these conditions and are prepared to implement them.

1. The following parties must attend: the contractors field supervisor, the project biologists for frogs, bats, beetles and birds, project engineer, project arborist, registered forester and licensed timber operator, the Public Works inspector, and Environmental Planning staff.
2. The following items shall be addressed: review of the preconstruction surveys, inspection of tree protection, disturbance envelope fencing, riparian and wetland flagging, review of the conditions of the Biological Opinions issued by the USFWS, review of the staging and stockpile areas, determination of the disposition of all fill to be removed from the site and any grading permits required to receive export, if applicable, and review of the forester's tree removal plan.

II. During construction the following conditions shall apply:

A. The appropriate specialist shall be on site during activities that may impact sensitive species. Specifically, the entomologist shall be on site during all grading activities within the Sandhills habitat; the biologist approved by USFWS to handle red-legged frogs shall be onsite during initial vegetation removal, as required by the Biological Opinion; the bat biologist shall monitor any identified maternity roosts as specified in the NES; the project arborist shall be present for all excavations that may impact roots of trees to be retained; the project forester shall supervise the implementation of the tree removal.

B. All protective fencing set in place to prevent incursion into tree root zones or riparian or wetland features shall remain in place for the duration of the project.

C. The contractor shall be responsible for implementing the approved erosion control plan, and for ensuring no contaminants enter into Zayante Creek downstream of the project site.

D. All stationary noise-generating equipment (generators, air compressors, etc.) shall be located at least 50 feet from all residences.

E. Internal engines shall all be muffled and shall not be allowed to idle unnecessarily.

F. Chippers, chainsaws, and other power-driven saw equipment shall not be operated within 300 feet of residences before 8AM or after 5PM on regular non-holiday weekdays.

G. Hours of operation shall be 8-5 weekdays and 9-5 Saturdays. If complaints are received by more than 40% of the residences within 300 feet of the project, Saturday operations shall be discontinued.

H. Dust shall be monitored at all times.

1. Grading shall not be allowed if winds in the project area exceed 15 mph.
2. Active grading areas shall be watered at least twice per day.
3. Inactive construction areas (no activity for 4 or more days) shall be stabilized with chemical soil stabilizers.
4. Haul trucks shall maintain a minimum 2 feet freeboard and shall be covered.
5. Inactive stockpiles shall be covered.
6. Streets shall be swept as necessary to prevent soil from tracking out of the project area.
7. A publicly visible sign shall be posted with the name and number of the contact person to receive complaints regarding dust, and action shall be taken within 48 hours of any complaint received. The sign shall also include the phone number for the Monterey Bay Unified Air Pollution Control District.

I. The applicant shall identify the legal disposal site of excess fill at the preconstruction meeting. Valid grading permits for sites other than the landfill must be presented prior to any site disturbance.

III. All construction shall be performed according to the approved plans for the Riparian Exception (See exhibit A). Prior to final inspection, the applicant/owner must meet the following conditions:

A. All site improvements shown on the final approved Riparian Exception erosion control and restoration plans shall be installed.

B. Pursuant to Sections 16.40.040 and 16.42.100 of the County Code, if at any time during site preparation, excavation, or other ground disturbance associated with this development, any artifact or other evidence of an historic archaeological resource or a Native American cultural site is discovered, the responsible persons shall immediately cease and desist from all further site excavation and notify the Sheriff-Coroner if the discovery contains human remains, or the Planning Director if the discovery contains no human remains. The procedures established in Sections 16.40.040 and 16.42.100, shall be observed.

Minor variations to this permit which do not affect the overall concept or density may be approved by the Planning Director at the request of the applicant or staff in accordance with Chapter 18.10 of the County Code.

Please note: This permit expires three years from the effective date listed below unless the conditions of approval are complied with and the use commences before the expiration date.

Approval Date: _____

Effective Date: _____

Expiration Date: _____

Claudia Slater	Matthew Johnston
Principal Planner	Project Planner

Appeals: Any property owner, or other person aggrieved, or any other person whose interests are adversely affected by any act or determination of the Planning Commission, may appeal the act or determination to the Board of Supervisors in accordance with chapter 18.10 of the Santa Cruz County Code.

COUNTY OF SANTA CRUZ
PLANNING DEPARTMENT

Date: September 25, 2002
Agenda Item: #2
Time: After 9:00 a.m.

STAFF REPORT TO THE PLANNING COMMISSION

APPLICATION NO: 00-0368

APN: 066-163-14,15, 16; 66-092-15,16
066-211-04; 066-212-02, 04;
066-221-06; 66-222-01,02.

APPLICANT: Santa Cruz County Department of Public Works
OWNERS: Harry Belz; Maria Ariagno; A.A. Glynn; VMS Wood Family Ltd. Partnership; D.K. and M.M. Wood and Mt. Hermon Association.

PROJECT SUMMARY DESCRIPTION: The project is a proposal to construct safety improvements to a 0.57-mile (approximately 3000 foot) section of Graham Hill Road. Project components include:

A. 1,445 linear feet of two-way left turn lane pockets and median;
B. Two 5-foot wide shoulder/bicycle lanes;
C. Increase in road width by an average of 8 to 12 feet. A 500-foot length of road in front of three residential driveways would be widened by up to 28 feet for an acceleration taper;
D. An approximately 165-foot long, up to18-foot high concrete retaining wall;
E. Roaring Camp driveway entrance reconfiguration;
F. Approximately 2,000 feet of new storm drain pipes and appurtenances;
G. Easements from adjacent properties;
H. Approximately 10,000 cubic yards of excavation and 5,000 cubic yards of fill;
I. Associated removal of an estimated 185 trees.

All project components are indicated on the project plans, Exhibit B. Project requires a Preliminary Grading Approval and a Riparian Exception.

LOCATION: An approximately 3000 foot long section of Graham Hill Road beginning at Roaring Camp Road southeast of Felton and ending at the existing climbing lane approximately 1,500 feet south of Summit Avenue.

PERMITS REQUIRED: Preliminary Grading Approval, Riparian Exception

ENVIRONMENTAL DETERMINATION: Proposed Negative Declaration with Mitigations

COASTAL ZONE:___Yes _X_No APPEALABLE TO CCC:___Yes_X_No

PARCEL INFORMATION

PARCEL SIZE:	NA
EXISTING LAND USE:	County Road, adjacent right of way
PARCEL:	NA
SURROUNDING:	Single family residential, Commercial, Park
PROJECT ACCESS:	Graham Hill Road
PLANNING AREA:	San Lorenzo Valley

EXHIBIT D

LAND USE DESIGNATION: NA
ZONING DISTRICT: NA
SUPERVISORIAL DISTRICT: Fifth

ENVIRONMENTAL INFORMATION

a. Geologic Hazards	a.	Not a constraint
b. Soils	b.	Soquel Loam, Zayante Coarse Sand
c. Fire Hazard	c.	County Fire, Felton Service Area
d. Slopes	d.	New cut and fill slopes
e. Env. Sen. Habitat	e.	Riparian, wetland, habitat for special status species
f. Grading	f.	Estimated 15,000 cubic yards
g. Tree Removal	g.	Estimated 185 trees greater than 4 inches diameter
h. Scenic	h.	Designated scenic road.
i. Drainage	i.	Zone 8 Flood Control/ Water Conservation District
j. Traffic	j.	No increase in number of trips, traffic controls will be required during construction.
k. Roads	k.	Graham Hill Rd. will be improved (bike and turn lanes, drainage, acceleration tapers, paving, striping)
l. Parks	l.	N/A
m. Sewer Availability	m.	N/A
n. Water Availability	n.	N/A
o. Archeology	o.	Survey performed, resources absent.

SERVICES INFORMATION

Inside Urban/Rural Services Line: ___Yes _X__No
Water Supply: NA
Sewage Disposal: NA
Fire District: Felton Fire Service Area
Drainage District: Zone 8 Flood Control/ Water Conservation District

HISTORY OF THE PROJECT:

The County of Santa Cruz Department of Public Works has been concerned with providing safety improvements to Graham Hill Road since at least 1997. Since then funding has been identified and two conceptual plan lines showing the proposed improvements have been produced. An application for permits was filed with the Planning Department in 2000. Subsequently an expanded initial study was prepared by an environmental consulting firm for use in the CEQA analysis (Exhibit D). The initial study (I.S.) included the following technical appendices: biotic analyses, traffic study, tree removal plan prepared by a Registered Professional Forester, noise study, preliminary geotechnical report and visual simulations (Attachments 6 through 14 of Exhibit D). As a result of the CEQA analysis, which was completed in 2001, a Negative Declaration with Mitigations has been proposed for the project.

Two community meetings were held to show the design to the public and to receive further community input. As a result of the community input the original concept was scaled back and revised to require less grading (significantly smaller fills and redesigned cuts) and the removal of fewer trees. The project as currently proposed, although still somewhat preliminary in terms of design, includes the changes suggested by the community that could be accommodated while still providing the basic improvements necessary to increase roadway safety.

EXHIBIT D

Final engineered plans will be returned to the Board of Supervisors prior to issuance of permits.

EXISTING CONDITIONS ON GRAHAM HILL ROAD

Graham Hill Road was originally constructed in 1954 along the alignment of a logging road. It has the geometry and scenic beauty of a winding country road. However, as the area has become developed the Average Daily Traffic (ADT) on Graham Hill has increased to between 13,000 and 16,600 cars per day. Traffic is expected to increase by another one third by 2008. The country road has evolved into an important arterial that connects the urban portions of Santa Cruz and points south with the San Lorenzo Valley.

The road has not been improved to safely carry the increased traffic. The steep downward grade toward Felton, limited sight distance around curves, tight radii of the curves, and unimproved drainage ditch alongside the driving lanes, which are hallmarks of this road, combine with the increasing number of vehicles to create a serious need for safety improvements. Graham Hill Road has a high number of accidents. It is also apparent from the statistics that the accidents tend to be the type that cause injury rather than the "fender bender" type of accident that is less of a concern. This is because the geometry, slope, and tree canopy (which contributes to a shaded and frequently wet roadway) allows so little margin for error. Incidents that might be minor in other settings can escalate to more serious collisions with higher potential for injury.

The records of accidents kept by the California Highway Patrol document the serious situation. There were 116 accidents on just this section of Graham Hill Road between 1996 and the first quarter of 2001. This is an average of 22 accidents per year. Rear-end and head-on collisions were the most frequent followed by overturning, broadside swipes and sideswipes. The rear-end accidents tend to occur when drivers stop in the travel lane in order to turn into driveways or to slow down to negotiate a curve that has inadequate sight distance. The head-on and broad side type of accident occurs when drivers lose control because of poor traction on wet pavement (frequently exacerbated by the lack of a shoulder in which to regain control of the car after it swerves), swerving into the open drainage ditch, or sharp curves driven at excessive speed. There were also numerous accidents involving collisions with trees and other objects. The records indicate that the roadway geometry and drainage conditions may create a hazard even absent the variable of excessive speed.

Excessive speed, though, is a current problem on the road. The posted speed limit on the project section of the road is 35 MPH with signs and flashing lights indicating a reduction to 25 MPH at curves, yet observed speeds of 40 or 45 MPH are common. It is difficult for the CHP to enforce the posted speed because there is not adequate shoulder or pull out space for CHP vehicles to safely stop motorists and issue citations. Excessive speed may be less common after the project is installed because not only will the posted speed limit be kept the same, but compliance may improve when enforcement by the CHP is made possible by the new shoulders and the removal of the open roadside ditch.

HOW THE PROJECT WILL ADDRESS THE EXISTING HAZARDOUS CONDITIONS

Each element of the project is designed to address a particular aspect of the existing traffic hazards. The hazard to vehicles exiting Graham Hill into driveways or onto Grandview or Summit Avenues will be lessened by the left turn pockets that will allow the turning car refuge outside of the through traffic lane(s) as it waits to execute the turn. This improvement will

EXHIBIT D

decrease rear end collisions. Safe left turns into Roaring Camp, a movement that is currently prohibited but which frequently occurs, will be possible with the designated left turn pocket and the intersection realignment. The hazard to drivers entering Graham Hill Road from fronting driveways will be lessened by the proposed acceleration lane between Stations 1 + 200 to 1 + 360 and a southbound merge/acceleration lane for left turns out of Summit Avenue. The addition of the shoulder/bike lanes, which must be a minimum of five feet wide to be useful, will create space outside of the travel lane for drivers to recover from a loss of control, create an area for CHP to safely pull out for traffic enforcement, and they will cover portions of the open drainage ditch that contributes to the swerve- related head on, broadside, and single car accidents. The shoulders will also increase the radius on the curves. The radius of the two most northerly curves will be increased to provide for safer movement overall. Lastly, vehicular traction will be addressed by the "open graded" mix (rough and knobby) type pavement and by significant drainage improvements that will minimize water on the road surface.

The Department of Public Works traffic engineering staff has calculated, using the recorded collision data and standard formulas, that the proposed left turn improvements at the three intersections alone have the potential to prevent a total of 37 collisions over a five year period and to reduce the severity of other collisions along the roadway.

ALTERNATIVE SAFETY STRATEGIES FOR GRAHAM HILL ROAD

The proposed design does not rely on adding new through travel lanes or wholesale straightening of curves. Rather the design incorporates several different strategies for improving traffic safety. The plan employs left turn pockets and acceleration tapers at selected points, drainage improvements, retaining wall, new five foot shoulders (which are the minimum feasible width), pavement that increases traction and standard striping with raised reflectors at the center and edge of travel lanes. Drainage improvements will contribute a significant portion of the expected increase in traffic safety.

The following additional or substitute strategies were considered but were rejected as infeasible or unlikely to provide the necessary reduction in hazard: center dividers, speed bumps, and increased enforcement without physical changes. Center dividers are not an accepted Caltrans design for this setting and they would require widening of the road approximately equal to the widening needed for the left turn lane option. Speed bumps are not acceptable on arterial roads pursuant to the Board of Supervisors policy as codified in the Design Criteria (1990). Further, speed bumps slow emergency response and on grades can actually create traffic hazards. Lastly, increased enforcement will be facilitated by the project. Enforcement is dependent on a certain amount of widening to create vehicle pull out space, as discussed in the previous section.

ENVIRONMENTAL REVIEW

A. Differences between the revised plan (current) and the plan evaluated by the Environmental Coordinator

The conceptual plan that was analyzed in the Initial Study and evaluated by the Environmental Coordinator is an earlier version of the proposal that is before you today. It was revised as a result of the environmental review process and public comment. The differences between the plan that was evaluated by the Environmental Coordinator and the one that is currently proposed are: the culvert between Grandview and Summit Avenues has been lengthened, the width of the bike lane/shoulder has been decreased from six feet to five in order to minimize disturbance, fill

EXHIBIT D

areas have been substantially decreased, and cut geometry has been in order to preserve trees.

As a result of these changes the estimated number of trees to be removed has been reduced from 321 to185. By reducing the number of trees to be removed the two trees that are defined as "ancient trees" pursuant to County Code 16.52.030 have been preserved. An additional four of the eight trees that are potential habitat for special status bats have been preserved (bringing the total to five preserved). As a result of lengthening the drainage culvert, depending on the final engineered plans, the amount of riparian woodland that will be lost may increase from 600 square feet to 745 square feet. Changes in the project impacts and the recommended mitigation measures that result from the revisions in the engineered plans are discussed in section C.

B. Technical Studies Provided

The environmental studies that were completed as part of the expanded Initial Study (I.S.) are: two entomological studies (Entomologic Consulting Services Ltd.), Biotic Assessment (Ecosystems West), Survey for Ben Lomond Spineflower (Ecosystems West), Breeding Bird Study (Mori Biological Consulting Services), Bat Survey (Paul Heady III), Woodrat Survey (Bland and Associates), Wetland Delineation (Biotic Resources Group), traffic study (Korve Engineering), Archaeologic Site Report (Pacific Legacy), Tree Removal Report (Staub Forestry and Environmental Consulting) and visual simulations.

C. Potential Environmental Impacts and Proposed Mitigation Measures

The I.S. identifies several potential impacts on the environment that may be caused by the proposed road improvements. Mitigation measures for each potential impact are recommended such that if the mitigations are properly implemented the impacts will be less than significant. The I.S. is attached as Exhibit D. A summary of the impacts and the related mitigation measures begins on page 3 of the proposed Negative Declaration, Exhibit C.

Of the potential impacts identified in the I.S. the one that has generated the most discussion is tree removal. The original plan envisioned removal of 321 trees; the current plan reduces that number by 43% to 185 trees. Of these, the project forester has identified 35 individuals as possibly being diseased and dying, thus reducing the tree loss caused solely by the project to 150. However, because diseased trees may decline over many years and even snags add habitat value to the forest the loss of trees is still best described as 185. These 185 are mostly oak, fir, redwood, and buckeye with madrone, maple, cedar and two riparian trees. They range in size from 4 inches to 72 inches, with almost half less than 12 inches and half greater than 12 inches. The five largest lost trees are 72, 72, 60, 50, and 48 inches respectively. The redesign of the road alignment prevents the loss of two redwoods, 96 and 72 inches respectively, which are over 200 years old and therefore qualify as "ancient trees" pursuant to County 16.52.030. The project forester has not identified any other individual trees as 200 or more years old.

A portion of the I.S. analysis that must be updated to reflect the reduced number of lost trees is the cumulative analysis, page 60 of Exhibit D. The removal of 321 trees is comparable to a 5 to 6 acre selective timber harvest (Staub Forestry, Attachment 20 of Exhibit D). Proportionately, the removal of 185 trees is comparable to a 3 acre selective timber harvest. Other tree-related impacts are different as follows: the timber harvest phase of the work will take approximately 26 work days, down from 45, assuming the same size crew and equipment. This decreases traffic impacts as well as the temporary noise impact associated with tree removal. The number of days during which there may be periodic road closures for felling decreases from 24 to 15 days. Also,

EXHIBIT D

the potential to displace roosting bats is decreased as five of the eight trees identified by the bat biologist as being most likely to provide good habitat are being preserved, whereas previously only one could be preserved.

The I.S. found that the drainage improvements and fill in the original plan would remove 145 square feet of in-stream wetland, 600 square feet of riparian vegetation, and 480 linear feet of drainage channel that is defined by the Army Corps of Engineers as "waters of the state". These losses occur where the open drainage is being culverted or otherwise filled under the new bike lane and shoulders. The revised plan extends one culvert such that an additional 145 square feet of riparian vegetation is lost and an additional 66 linear feet of channel are filled. This slightly increases the biotic impact relative to the original plan. However, because the additional impact area is already included in the area that is recommended to be surveyed for California Red Legged frogs, and the riparian vegetation mitigation area (recommended at the ratio of 3:1) can easily be expanded to accommodate the additional 145 sq. feet of lost vegetation, the adverse impact remains less than significant.

There are three visual simulations of different parts of the project available. Two, one at the Roaring Camp entrance and one at the point of maximum cut on the north side of the road, are included in the IS (Attachment 8 to Exhibit D). An additional visual simulation was prepared to show the impact of the retaining wall that is proposed on the south side of the road to protect the Mt. Hermon water tank and well (Exhibit E). The wall, which will be approximately 165 feet long and up to 18 feet high, functions to protect the existing water tank and well that belong to the Mt. Hermon Association. This additional simulation shows two alternate types of retaining wall, one has the colorized and textured surface that is recommended to mitigate visual impacts and the other is a standard 18 foot redwood wall. This simulation illustrates how the retaining wall might appear when completed; it does not change the conclusion of the I.S. that the visual impact is less than significant if mitigated as proposed.

The following table summarizes the differences between the potential environmental impacts and recommended mitigation measures for the original plan that was the subject of the I.S. and the revised plan that is the current project:

IMPACT	INCREASED	NO CHANGE	DECREASE	COMMENTS
Geo 1		X		
Geo 2		X		
Hydro 1		X		
Bio 1			X	Additional trees that are potential bat and roosting bird habitat are preserved.
Bio 2		X		
Bio 3		X		
Bio 4		X		
Bio 5	X			Additional 145 sq.ft. of riparian woodland removed. Mitigation still applies.
Bio 6		X		
Noi 1			X	Number of days of timber removal will be significantly reduced.
Air 1		X		

EXHIBIT D

Aesth 1		X		
Serv 1	X			A larger amount of fill will be exported either to permitted sites or to the landfill.
Cumu 1			X	Traffic interruption will not be cumulative with improvements for Graham Hill Showgrounds

Note that in the two cases where the potential impact is increased the changes are a result of revisions to the project that were made in response to comments on effects of the project that were identified in the proposed Negative Declaration. Pursuant to CEQA section 15073.5 the increases do not create new, avoidable, significant effects and therefore the proposed Negative Declaration does not have to be recirculated.

PUBLIC COMMENT TO DATE

There have been two phases of formal public comment on the project: the 30 day agency and public review period following the publication of the proposed Negative Declaration and the community meetings held in Felton on October 3 and November 7, 2001. Request for approval of grant requests and acceptance of funds related to this project have also been heard by the Board of Supervisors on several occasions.

In addition to the feedback that was received about the removal of 321 trees, comments were received on other topics. Several members of the public asserted that the bike lanes will not be used and should not be included, while others asserted that approved transportation policies support alternatives to cars and that the roadway should not be improved at all. The bike lanes do appear in the adopted Bikeways plan (Santa Cruz County Bicycle Plan, August, 2000) and will ultimately connect with lanes to the northwest and southeast. A new section of bicycle lane is currently being constructed westward from the intersection of Zayante Road just northwest of the project.

Several commenters assert that the improved road will encourage greater speed and that a cycle of continued road expansion will occur. Traffic engineering staff thinks that because the speed limit will remain the same, enforcement ability will be enhanced, and that many constraints to speed such as the grade and the curves will remain, observed speed will not increase significantly. Further, calculations based on accident data and the project improvements show that collisions can be expected to decrease.

Other commenters requested a full Environmental Impact Report. In response, we note that none of the detailed studies identified significant impacts that could not be mitigated, and that in addition the project has been revised to further lessen impacts. Also, various design alternatives have been considered and one of these has been chosen, even though the alternatives were not evaluated in the form of an impact report.

There were additional comments as well. Comments received during the CEQA review period are attached to the I.S. (Attachment 19 of Exhibit D). Comments received during the first public meeting are summarized and responded to in an "Update News" newsletter that was distributed in the community. A copy of the newsletter is attached as Exhibit F.

EXHIBIT D

SUMMARY ANALYSIS:

In summary, the hazardous conditions and collision data demonstrate that the road cannot safely transport the number of vehicles that are currently using it. Various means of decreasing the hazards have been seriously considered. The proposed project represents a compromise between achieving safety goals and minimizing adverse environmental impacts. Even within that compromise there are trade offs that must be made between different adverse impacts, each of which cannot be eliminated or minimized to the same degree. For example, the use of retaining walls will cut down the amount of area that is disturbed by clearing and grading and therefore will allow the preservation of habitat and some trees. On the other hand, retaining walls increase the visual impact to the scenic corridor, increase cost, and are not desirable immediately adjacent to a bike lane. Another example of this trade off is the width of the road versus the size of the disturbed area. A wider the road, with wider shoulders and increased separation between bicyclists and cars will lead to increased safety. On the other hand, the greater width exacerbates the environmental impacts. The project that is before you represents an attempt to achieve balance among all of these concerns.

As proposed and conditioned the project is consistent with all applicable codes and policies of the Santa Cruz County Ordinances and General Plan/LCP. Please see Exhibit "G" ("Findings") for a complete listing of findings and evidence related to the above discussion.

RECOMMENDATION:

Staff recommends the Planning Commission take the following actions:

1. **ADOPT** the proposed Mitigated Negative Declaration;
2. **APPROVE** Application Number **00-0368,** based on the attached findings and subject to the attached conditions.
3. **AUTHORIZE** the Planning Department to issue a subsequent grading permit consistent with this Preliminary Grading Approval.

EXHIBITS

A. Location Map
B. Project plans
C. Proposed Negative Declaration with Mitigations
D. Expanded Initial Study
E. Visual Simulation at Retaining Wall
F. Community newsletter from public meeting
G. Findings for Riparian Exception

SUPPLEMENTARY REPORTS AND INFORMATION REFERRED TO IN THIS REPORT ARE ON FILE AND AVAILABLE FOR VIEWING AT THE SANTA CRUZ COUNTY PLANNING DEPARTMENT, AND ARE HEREBY MADE A PART OF THE ADMINISTRATIVE RECORD FOR THE PROPOSED PROJECT.

EXHIBIT D

Report Prepared By: _____

Paia Levine
Santa Cruz County Planning Department
701 Ocean Street, 4th Floor
Santa Cruz CA 95060

Report Reviewed By: _____

Cathy Graves
Principal Planner
Development Review

EXHIBIT D

COUNTY OF SANTA CRUZ

PLANNING DEPARTMENT

701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123
TOM BURNS, PLANNING DIRECTOR

Addendum to the Negative Declaration Issued for Application 00-0368

On October 9, 2002, the Santa Cruz County Planning Commission approved application 00-0368, a proposal to widen Graham Hill Road to provide safety and drainage improvements and a bike lane along a 3,200-foot stretch of roadway. Although the project was approved and the CEQA document (Negative Declaration with mitigations) adopted, funding constraints prevented the Department of Public Works from moving forward, and the Notice of Determination was not filed at that time. On August 7, 2006 the Department of Public Works resubmitted an application (06-0388) for a scaled back version of the same project. After review by the Environmental Coordinator determined that the proposed project was substantially the same with reduced impacts as had been previously approved under application 00-0368, the Notice of Determination was filed with the Clerk of the Board on April 10, 2007. Further revisions to the project caused application 06-0388 to be abandoned, and the current project for application 09-0200 to replace it.

An addendum to an adopted Negative Declaration may be prepared under CEQA Guidelines section 15164(b) if only minor technical changes or additions are necessary to an adopted Negative Declaration. Per the guidelines, the addendum may be attached to the original adopted Negative Declaration and considered by the decision-making body prior to approval of the project. The Environmental Coordinator has reviewed the current proposal and has determined that most of the changes in the project result from removing the bike lane and retaining walls from the proposal, reducing the potential impacts of the project.

The only change not covered by the reduced width of the project is the determination of the area of Sandhills habitat impacted by the project and the mitigation required as a result. The inclusion of soil types as an indicator for potential habitat for the Mt. Herman June Beetle has resulted in a larger area of the project to be classified as Sandhills habitat. The previous mitigation proposed was the restoration of degraded Sandhills habitat in the vicinity, a project that has since been undertaken as mitigation for the construction of a cellular tower. The revised mitigation is a combination of on-site restoration of the impacted areas and the purchase of restoration credits from the Sandhills Conservation Bank. The Environmental Coordinator has determined that the impacts to Sandhills are not new impacts and are not substantially more severe than the approved project, that the project proponent is not opposed to the new mitigation. Based on these findings, the Environmental Coordinator has determined that the Negative Declaration does not require recirculation, if approved by the Planning Commission.

Attached please find the following documents:

1. The project descriptions for applications 00-0368 and 09-0020
2. Summary design changes between 00-0368 and 09-0200
3. The Negative Declaration and Notice of Determination for application 00-0368
4. The Mitigation Monitoring Plan for application 00-0368
5. The overview of changes to the Mitigation Monitoring Plan
6. The Mitigation Monitoring Plan revised for application 09-0200

Claudia Slater, Environmental Coordinator

6/29/09
Date

EXHIBIT E

COUNTY OF SANTA CRUZ

PLANNING DEPARTMENT

701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060

(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123

TOM BURNS, PLANNING DIRECTOR

00-0368

PROJECT DESCRIPTION: The project is a proposal to construct safety improvements to a 0.57-mile (approximately 3000 foot) section of Graham Hill Road. Project components include:

A. 1,445 linear feet of two-way left turn lane pockets and median;
B. Two 5-foot wide shoulder/bicycle lanes;
C. Increase in road width by an average of 8 to 12 feet. A 500-foot length of road in front of three residential driveways would be widened by up to 28 feet for an acceleration taper;
D. An approximately 165-foot long, up to18-foot high concrete retaining wall;
E. Roaring Camp driveway entrance reconfiguration;
F. Approximately 2,000 feet of new storm drain pipes and appurtenances;
G. Easements from adjacent properties;
H. Approximately 10,000 cubic yards of excavation and 5,000 cubic yards of fill;
I. Associated removal of an estimated 185 trees.

09-0200

PROJECT DESCRIPTION

A. Construct 200 lineal feet of 11 ft wide left turn lane to serve the Roaring Camp Railroads theme park.
B. Construct 3,220 lineal feet of continuous 3 ft wide asphalt paved shoulder on the north side of Graham Hill Road. Approximately 775 lineal feet of 3 ft wide asphalt paved shoulder is proposed to be constructed on the south side of Graham Hill Road from the private driveway entrance at Pro Build to approximately 300 ft southeast of the Roaring Camp Railroads driveway entrance.
C. Construct 0.17 feet thick asphalt pavement overlay over the entire new road surface for the full project length (3,220 ft).
D. Hold the existing road alignment and profile of Graham Hill Road for the full length of the project (3,220 lineal feet). Hold the existing right edge of pavement of Graham Hill Road beginning at approximately 300 lineal feet southeast of the Roaring Camp Railroads driveway entrance to the end of project (~2,400 lineal feet total).
E. No retaining walls are proposed under the revised project. All earth cuts are to be 1 : 1, and all earth fills are proposed to be 1.5 : 1.
F. The Roaring Camp Railroad driveway entrance is to remain reconfigured as in the original Graham Hill Road project so that it meets current accepted County standards for private driveway geometry.
G. Construction of approximately 1,450 lineal feet of new primary 48" diameter storm drainpipe to carry the 25-year flows from the total tributary drainage basin. The outlet of the primary storm drainpipe is at the tributary side drainage channel to Zayante Creek just west of the railroad track crossing at Graham Hill Road (approx. project Station 11+00). A reinforced concrete energy dissipater structure is proposed at the outlet. A silt and grease trap manhole is proposed to be constructed just before the concrete outlet structure. In addition to the 1,450 lineal feet of 48" diameter primary storm drain system, approximately 860 lineal feet of additional storm drainpipe (cross culverts and tributary systems) is proposed to be constructed.
H. Approximately 53 property easements and right-of-ways are necessary to be acquired.
I. Approximately 6,200 cubic yards of earth excavation and 1,000 cubic yards of imported earth borrow are required for construction of the project.
J. The number of trees 4 inches or greater required to be cut for the project is 52.

EXHIBIT E

ATTACHMENT 1

GRAHAM HILL ROAD IMPROVEMENT PROJECT
Original 2000 Application 00-0368

DIFFERENCES IN IMPROVEMENTS BETWEEN 2000 PLANS AND 2008 PLANS

I. OVERALL GENERAL CONCEPTUAL DIFFERENCES

A. The 2000 improvement design included a major horizontal realignment of Graham Hill Road from approx. Sta 17+00 to Sta 33+50. The 2008 improvement design follows the existing road centerline from beginning to end, (Sta 12+75 – Sta 44+64).

B. The left turn lane pockets at Grand View and Summit Aves. that were included in the 2000 design have been both eliminated from the 2008 design. The left turn pocket and lane transitions at the entrance to Roaring Camp RR & Big Trees property remains in the 2008 design.

C. The 165 feet of 15 ft high concrete retaining wall on the southwest side of the road from Sta 24+60 to Sta 26+25 has been eliminated from the 2008 design.

D. The overall scope and size of storm drain improvements remains the same for both the 2000 & 2008 designs.

E. The estimated volume of road excavation has been reduced from 10,000 cy in the 2000 design to 6,000 cy in the 2008 design.

II. SPECIFIC DESIGN DIFFERENCES

A. The widths and limits of road embankment fill on the south side of the improved road at Roaring Camp Big Trees property, (Sta 12+75 to Sta 22+00) remains the same for both designs.

B. Approximately 40 feet of existing drainage channel on the south side of the road (Sta 27+50) has been realigned approx 25 feet to the west at the edge of road. The channel realignment has enabled the saving of the 96" old growth redwood at the south edge of the road (Sta 27+45).

C. The sliver embankment fills on the south side of the road at Sta 33+00 – Sta 34+20, Sta 39+20 – Sta 39+85, and Sta 40+60 – Sta 41+10 included in the 2000 design have been eliminated from the 2008 design.

D. The embankment cut on the north side of the road from Sta 33+00 to Sta 39+00 and from Sta 40+00 to Sta 44+ 00 remains the same for both the 2000 and 2008 designs.

EXHIBIT E
ATTACHMENT 2

011-07

County of Santa Cruz

PLANNING DEPARTMENT

701 OCEAN STREET, SUITE 400, SANTA CRUZ, CA 95060-4073

(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123

ALVIN D. JAMES, DIRECTOR

NEGATIVE DECLARATION AND NOTICE OF DETERMINATION

00-0368 County of Santa Cruz Department of Public Works

The project is a proposal to construct safety improvements to a 0.64-mile section of Graham Hill Road. Project components are listed in the item A-1, below. Components B, C, H, and I occur throughout the site. Components A, D, E, and F are shown in the project plans provided in Attachment 4 and keyed by letter to the project description components outlined below:

A. 1,300 linear feet of two-way left lane;
B. Two 6-foot wide shoulders/bicycle lanes (0.64 miles in length);
C. Realignment of approximately 3,000 feet of road to increase the road width by 12 feet, including bike lanes, except for a 1,200-foot length of road that fronts five adjacent residence driveways would be widened by 16 feet for an acceleration lane;
D. A 175-foot long, 19-foot high concrete retaining wall;
E. Roaring Camp driveway entrance reconfiguration;
F. Approximately 2,000 feet of new storm drain pipes and appurtenances;
G. Easements from adjacent properties;
H. Approximately 9,000 cubic yards of grading, including 3,300 cubic yards of exported cut; and
I. Associated removal of 321 trees.

All project components are described in more detail below and are shown in Attachment 4.
APN(s): 066-163-14thru16, 066-092-15&16, 066-211-04&05, 066-212-02, 066-221-06, 066-222-01&02, 066-222-06
Kim Vester, Planner Zone Distrct(s):PR; R-1-15;SU

Findings:

This project, if conditioned to comply with required mitigation measures or conditions shown below, will not have significant effect on the environment. The expected environmental impacts of the project are documented in the Initial Study on this project attached to the original of this notice on file with the Planning Department, County of Santa Cruz, 701 Ocean Street, Santa Cruz, California.

APR 2007
RECEIVED
CLERK OF THE BOARD
BOARD OF SUPERVISORS
COUNTY OF SANTA CRUZ

Required Mitigation Measures or Conditions:

____ None

__XX__ Are Attached

Review Period Ends November 27, 2000.
Date Approved By Environmental Coordinator December 7, 2000.

KEN HART
Environmental Coordinator
(831) 454-3127

If this project is approved, complete and file this notice with the Clerk of the Board:

NOTICE OF DETERMINATION

The Final Approval of This Project was Granted by Planning Commission

on Sept 25, 2002. No EIR was prepared under CEQA.

THE PROJECT WAS DETERMINED TO NOT HAVE SIGNIFICANT EFFECT ON THE ENVIRONMENT.

Date completed notice filed with Clerk of the Board: April 10, 07

THIS NOTICE HAS BEEN POSTED AT THE CLERK OF THE BOARD OF SUPERVISORS OFFICE FOR A PERIOD COMMENCING 19 April 2007 AND ENDING 19 May 2007

EXHIBIT E

ATTACHMENT 3

NAME : County of Santa Cruz Department of Public Works
APPLICATION: 00-0368
A.P.N: 66-163-14, 66-163-15, 66-163-16; 66-092-15, 66-092-16; 66-211-04,-05; 66-212-02; 66-221-06; 66-222-01,02, 66-222-06

(revised 12/7/00)

NEGATIVE DECLARATION MITIGATIONS

1. Prior to site disturbance, to ensure that all mitigations are implemented in a coordinated fashion, the Public Works Department shall contact County Planning to arrange a pre-construction site meeting among: the contractor's field supervisor, project biologist, project engineer, Public Works inspector, Project Registered Professional Forester, Licensed Timber Operator and Environmental Planning staff. The protective fencing specified in Mitigation Measures BIO-4 and BIO-5 will be inspected, pre-construction biotic surveys pursuant to Mitigation Measures BIO-1, BIO-2, and BIO-3 will be reviewed, and terms and conditions of the Biological Opinions issued by the USFWS will be reviewed. Operational section of the Tree Removal Report (Staub Forestry, June 2000) shall be reviewed. The proposed receiving site(s) for excess fill, debris, and stumps shall be identified and permit(s) for the receiving site(s) shall be reviewed.

2. Impact GEO-1: Impacts to Slope Stability. Implementation of the proposed project could result in slope instability. (Checklist Item A.1)

   Mitigation Measure GEO-1: Prior to issuance of a grading permit, the applicant shall:

   - Submit a design-level geotechnical investigation for review and approval by Environmental Planning staff in order to confirm geologic and soil conditions reported in the Geologic/Geotechnical Feasibility Study for Improvements to Graham Hill Road (Haro, Kasunich and Associates, Inc., 1999). The analysis shall be conducted by a licensed Certified Engineering Geologist or Geotechnical Engineer and should provide refined recommendations for grading, filling, and slope stabilization. Slope stability calculations for static and earthquake conditions shall be made to demonstrate that cut and fill slopes would remain stable during an earthquake;

   - Submit a letter of plan review from the project geotechnical engineer verifying that all the recommendations in the design level geotechnical reports are included in the plans.

   - Prior to final inspection, applicant shall submit a letter of inspection from the project geotechnical engineer verifying that all work was done in conformance with the technical report(s).

3. Impact GEO-2: Impacts to Watercourses from Erosion. Construction of the proposed project could result in erosion into adjacent creeks and watercourses. (Checklist Item A.2)

EXHIBIT E
ATTACHMENT 4

Mitigation Measure GEO-2: Prior to issuance of a grading permit, the applicant shall submit a detailed erosion control plan for review and approval by Environmental Planning staff. The plan shall indicate proposed methods for control of runoff, erosion and sediment movement during grading, timber removal, road construction and installation of the storm drainage pipe. Runoff shall be conveyed to non-erodible channels or conduits to the nearest drainage course designated for stormwater runoff. Appropriate energy dissipaters shall be indicated to prevent erosion at the point of discharge. Runoff from disturbed areas shall be detained or filtered by berms, vegetation filter strips, catch basins, or other means as necessary to prevent the escape of sediment from the disturbed area.

The plan shall specify temporary revegetation for newly disturbed slopes (consistent with Mitigation Measures BIO-4 and BIO-5), mulching with straw and/or other slope stabilization material, and permanent planting specifications. Plantings (temporary and permanent) shall be compatible with existing habitat .The plan shall include a letter from the project biologist verifying compatibility with biotic resources on site.

The plan shall also incorporate and list the operational recommendations given in the Tree Removal Report (Staub Forestry and Environmental Consulting, June 2000) pages 9 through 13. Specifically, watercourses and the spring/seep shall be flagged, avoided, and treated pursuant to the report and roads, landings and skid trails shall be used only as specified in the report.

4. Impact HYDRO-1: Impacts to Water Quality. Erosion and sedimentation, if not properly controlled, could reduce water quality in the tributary and the main stem of Zayante Creek. Grading and tree removal could increase suspended sediment and turbidity in receiving waters.

Mitigation Measure HYDRO-1: To reduce the potential for degradation of surface water quality during construction, the applicant shall implement the following measures:

- An erosion control plan shall be implemented per Mitigation Measure GEO-2;
- All requirements of the RWQCB shall be met;
- A refueling area shall be designated outside the project area; and
- Final drainage plans shall include a silt and grease trap in the drainage pipe that will exit at Station 1+050. The trap shall be maintained according to the following monitoring and maintenance procedures:

  - The trap shall be inspected to determine if it needs cleaning or repair prior to October 15 each year at a minimum;

  - A brief annual report shall be prepared by the trap inspector at the conclusion of each October inspection and submitted to the Drainage Section of the Department of Public Works within 5 days of inspection. This monitoring report shall specify

EXHIBIT E
ATTACHMENT 4

any repairs that have been done or that are needed to allow the trap to function adequately.

5. Impact BIO-1: Impacts to Nesting Raptors and Roosting Bats. Grading, construction, tree and vegetation removal along the project alignment has the potential to impact nesting raptors and roosting bats. (Checklist Item C.1)

Mitigation Measure BIO-1: The applicant shall take the following steps to avoid impacts to nesting raptors and roosting bats that may inhabit the project area:

- Prior to issuance of the Riparian Exception or grading permit, submit a construction schedule with start/end dates for each phase of the project. Schedule tree removal and construction to occur outside the nesting period of most raptors (i.e., a window for construction from August through February). If this construction period is not practical, conduct presence/absence surveys for nesting raptors in the appropriate season (March to August) to determine if any raptors are nesting within 500 feet of the construction area. The optimal time for raptor surveys is in May, when the birds are most active. If it is not possible to survey in May, survey shall be completed no more than one month prior to the start of construction.
  If no nesting is occurring, tree removal and construction can proceed. If raptors are nesting within 500 feet of the area, a 500-foot buffer shall be established around each nest tree. No construction or tree removal shall occur within the buffer zone. Once the young have fledged from the nest, as determined by a qualified wildlife biologist, tree removal and construction can continue.

- Prior to issuance of the Riparian Exception or grading permit, submit a construction schedule with start/end dates for each phase of the project. Schedule tree removal to occur outside the maternity period for most bats (May through ~~July~~ August 31 maternity period). A qualified bat biologist shall conduct a pre-tree removal survey during June 15 - July 15 of the summer preceding construction, of those trees identified to be potential roosts (Class 3,4 and 45 trees) in the bat survey (Heady, August 2000) to determine ~~bats currently inhabit the trees~~ if there are maternal roosts present. The survey shall be submitted to the Planning Department for review and approval. A follow-up bBat surveys of the trees identified as being potential roost trees (though not necessarily maternal roosts) shall occur and be submitted to Environmental Planning staff for review and approval within two weeks of the scheduled tree removal activities.

  If bats (but no maternity roosts) are present, the bat biologist shall place short-term exclusionary devices over the roost site once bats have emerged from the roost for their nightly foraging. This action would prevent them from returning to trees within the construction area and allow them to find other roosts. The trees may then be removed.

  If tree removal occurs during the breeding season and maternity roosts are

EXHIBIT E
ATTACHMENT 4

detected, the trees shall be retained until the young have weaned and can forage on their own (through the end of August). A qualified bat biologist shall monitor the roost sites, determine when roosting is completed, and submit information to Environmental Planning verifying that trees can then be removed.

- Reproducing bats were found at the project site during the 2000 surveys; however, specific roost sites were not determined. Although roosting trees would not be removed during the breeding season (thus avoiding direct impacts to breeding bats), tree removal may result in an small overall loss of bat breeding habitat (one to two suitable hollows in older redwoods) on the site (if trees to be removed are confirmed to support maternity roosts).
  As mitigation for the removal of maternity ~~roost tree~~ habitat (if trees to be removed are confirmed to support maternity roosts), the applicant shall implement a bat roost enhancement project. The project shall be designed by a qualified bat biologist to fit the project location and the species of bat that was found in the maternal roost. The plan shall include at least one new or enhanced roost site (bat box or alternative) for each lost roost. The project shall be implemented between the completion of the timber removal and the following April 1. ~~Bat boxes shall be placed within the project area to replace lost maternity roost sites~~. If no bat maternity roost trees are removed then this measure would not be required.

6. Impact BIO-2: Impacts to Mt. Hermon June Beetle. Grading, vegetation removal, vegetation trimming, and construction activities within the project area, even though the habitat is considered marginal, has the potential to impact this sensitive species if this work is done during the flight season (June and July) or if larvae are present on roots and are disturbed. (Checklist Item C.1)

   Mitigation Measure BIO-2: To mitigate any impacts to Mt. Hermon June beetle that may be present in the project area, prior to issuance of a grading permit the applicant shall obtain a Section 7 biological opinion from the US Fish and Wildlife Service (USFWS) for Mt. Hermon June beetle. To avoid taking this species, all terms and conditions stipulated by USFWS during the Section 7 consultation shall be implemented.

7. Impact BIO-3: Impacts to California Red-Legged Frog. Grading construction and maintenance in and adjacent to the intermittent watercourses within the project work area have the potential to impact California red-legged frog, if this species occurs in the area at the time of construction, through noise, dust and direct mortality. (Checklist C.1)

   Mitigation Measure BIO-3: To mitigate any impacts to California red-legged frogs that may be present in the project area, prior to issuance of a grading permit the applicant shall obtain a Section 7 biological opinion from the USFWS. The Section 7 process shall be completed prior to issuance of a grading permit. All terms and conditions stipulated by USFWS in the Section 7 Biological Opinion shall be implemented.

8. Impact BIO-4: Impacts to Waters of the United States, including Wetlands and Other Waters. Grading, construction and maintenance in and adjacent to the intermittent

EXHIBIT E
ATTACHMENT 4

watercourses within the project work area would remove approximately 145 square feet of wetlands (0.003 acres) and 480 linear feet of other waters and could cause indirect impacts to aquatic resources by erosion or sedimentation. (Checklist Item C.2)

Mitigation Measure BIO-4: The following steps are required to mitigate impacts to Waters of the U.S at the tributary to Zayante Creek and along the intermittent drainages:

Prior to issuance of the grading permit and Riparian Exception

- The applicant shall submit a detailed wetland mitigation plan for review and approval of Planning staff. The plan shall include provisions to re-establish wetland habitat within the retained and/or re-constructed drainage channel at a 3:1 replacement ratio. As approximately 145 square feet of wetland habitat would be directly impacted by the project, the mitigation shall specify the establishment and maintenance of 435 square feet of replacement habitat. The replacement habitat shall occur within the intermittent drainage south of Graham Hill Road in the easternmost portion of the project area (as shown in Figures 6 and 7, pages 26 and 27 in Attachment 10). Mitigation activities will include the following actions: installation of native wetland plant species within the existing and/or re-formed drainage at the foot of the new roadway embankment, and implementation of a 5-year maintenance and monitoring program to ensure the habitat replacement program is successful.

    - The applicant shall consult with the US Army Corps of Engineers (ACOE) to determine the total amount of other waters that would be required to mitigate permanent loss of other waters.

    - The applicant shall secure permits from the ACOE, California Department of Fish and Game (CDFG) and Regional Water Quality Control Board (RWQCB), and implement any measures specified by these agencies.

    - The headwall at the northern end of the project site shall be designed so that there is no incursion into existing willows and other riparian vegetation. Headwall design shall be included in final project plans and shall be subject to review and approval by Environmental Planning staff.

Pre-Construction Period

- Applicant shall demarcate the outer limit of the construction area with temporary chain-link construction fencing (minimum 5 feet in height) installed along the limit of the grading line. Where construction occurs near culverts or adjacent to intermittent drainages and/or riparian woodlands, install silt-containing devices (i.e., straw bales or silt fencing) along the bottom edge of the chain-link fencing. The fencing shall be in place for inspection during the pre-construction site meeting.
  The integrity of the fencing shall be periodically checked during the construction period to ensure that the adjacent riparian habitat/waterways are not inadvertently impacted. After the limits of the project are staked, the exact amount of riparian

EXHIBIT E
ATTACHMENT 4

habitat to be impacted by the project shall be measured.

Post-Construction Period

- The erosion control plan shall be implemented, per Mitigation Measure GEO-2. Native riparian and wetland plant materials shall be utilized for erosion control and revegetation.

9. Impact BIO-5: Impacts to Riparian Woodland Habitat. Grading, vegetation removal, vegetation trimming, and construction of the proposed improvements (including maintenance of culvert openings) would cause removal of approximately 600 square feet (0.01 acre) of riparian scrub vegetation (i.e., removal of a dogwood-dominated riparian thicket). Additionally, one cottonwood tree and one willow tree would be removed. (Checklist Item C.2)

Mitigation Measure BIO-5: The applicant shall do the following in order to compensate for impacts to riparian scrub (riparian woodland) habitat that would occur in the project area:

Prior to issuance of the grading permit and Riparian Exception

- The final layout of the widened roadway shall minimize removal of native riparian trees and shrubs. Any revised layout shall remain within the boundaries of the approved project boundaries. Prior to the pre-construction site meeting any prior to any disturbance, the limits of disturbance shall be marked in the field and checked by a qualified biologist.

- The applicant shall submit a detailed riparian mitigation plan for review and approval of Planning staff. The plan shall include provisions to re-establish riparian habitat within the retained and/or re-constructed drainage channel at a 3:1 replacement ratio. Approximately 600 square feet (0.01 acre) of riparian habitat (riparian scrub) would be directly impacted by the project. Therefore, to achieve a 3:1 replacement ratio, the establishment and maintenance of 1,800 square feet is required. The replacement habitat shall occur within the intermittent drainage south of Graham Hill Road in the easternmost portion of the project area, as shown in Attachment 10, Figures 6 and 7. Mitigation activities shall be implemented concurrent with mitigation for wetland impacts and shall include the following actions: installation of native riparian plant species within the existing and/or re-formed drainage at the foot of the new roadway embankment, and implementation of a 5-year maintenance and monitoring program to ensure the habitat replacement program is successful. The applicant shall secure permits from the CDFG and implement any additional measures as specified by jurisdictional agencies (CDFG or ACOE).

- A qualified specialist shall prepare a revegetation plan that indicates the location

EXHIBIT E

ATTACHMENT 4

and techniques for the replanting of the riparian trees and riparian scrub. To preserve the existing gene pool at the project site, propagation materials shall be collected from within the project area or from nearby areas with similar site conditions and plant material.

- The revegetation plan shall be incorporated into the Streambed Alteration Permit and riparian exception. The applicant shall be responsible for implementation of the riparian revegetation, a 5-year maintenance and monitoring program, remedial actions if the revegetation does not meet the plan's stated success standards (i.e., percent survival of planted trees and shrubs) and annual monitoring. Revegetation shall be implemented within one year of road widening construction activities. This schedule would allow the applicant time to procure/grow plant materials for the project, as needed. Revegetation activities are separate from erosion control measures, which shall be implemented immediately after construction.

- The qualified biologist shall inspect the construction area and verify the number of native riparian trees to be directly impacted by construction activities. (Based on current designs, one cottonwood tree, one willow, and several creek dogwoods would be impacted.) The number of mature native trees lost shall be replaced at a 3:1 ratio.

- Prior to disturbance, chain link fencing and silt barrier fencing shall be erected at the limit of disturbance and maintained throughout construction. The integrity of the fencing shall be periodically checked during the construction period to ensure that the adjacent riparian habitat, wetlands and watercourses are not inadvertently impacted.

Construction Period

- Trimming of willows and other native vegetation shall be limited to the minimum amount necessary. Any trimming shall be conducted under the direction of a qualified arborist.

Post-Construction Period

- An erosion control plan pursuant to Mitigation Measure GEO-2 and all other measures pursuant to Mitigation Measure BIO-4 shall be implemented.

10. Impact BIO-6: Impacts to Native Trees to be Retained. Grading, vegetation removal, vegetation trimming, and construction activities within the dripline of forest and riparian trees to be retained have the potential to significantly affect the health and vigor of the trees. (Checklist Item C.2)

Mitigation Measure BIO-6: The following steps are required to avoid and minimize impacts to forest trees that are to be retained:

EXHIBIT E
ATTACHMENT 4

Construction Period

- The applicant shall arrange for the participation of a qualified arborist whenever trenching and other excavation occurs within the dripline of trees to be retained. Such work shall be conducted under the supervision of the arborist. The arborist shall instruct construction workers to hand cut roots, irrigate cut areas, or implement other measures (such as fencing) as deemed necessary to ensure the health and vigor of the retained trees.

- Roots cut during trenching or excavation activities, especially roots in the top three feet of the soil surface shall be irrigated and covered with damp burlap. The burlap shall remain moistened and kept in place until backfill is placed and watered in. The backfill should be watered in thoroughly around the roots to ensure complete root to soil contact with no air spaces in the fill. Backfill materials should be similar in texture to site soil, ideally backfill should be stockpiled unamended site soil.

- Pruning of trees to be retained shall be done according to ISA (International Society of Arboriculture) standards and under the direction of a certified arborist, not by construction personnel. Pruning shall consider the maximum height of the equipment operating on site, keeping in mind the safety of the equipment operators. Excessive pruning shall be avoided and small branches should be left in place to help shade the trunks of trees and vegetation newly exposed to sunlight.

- Where surface grades are to be modified, water shall drain away from the tree trunks in a manner similar to the grade prior to construction modification.

- Vehicles, materials and equipment shall not be parked or stored within the dripline of any trees or shrubs at any time. The storage yard for materials and equipment shall be designated near the site and should be well away from protected trees and vegetation. If construction equipment absolutely must operate under the dripline of trees, the equipment shall operate on double, overlapping thick sheets of plywood placed on top of the protective layer of mulch.

Post-Construction Period

- The applicant shall be responsible for implementing a 3-year tree maintenance and monitoring program wherein a certified arborist will periodically inspect the retained trees. The applicant will implement remedial actions if the trees exhibit significant declines in health and vigor, under the direction of the certified arborist.

11. Impact NOI-1: Short-Term Noise Impacts. Existing residential uses along Graham Hill Road would be subject to significant short-term noise generated by construction activities on the project site.

Mitigation Measure NOI-1: The applicant shall incorporate the following measures to minimize short-term noise impacts into the construction contract. These measures

EXHIBIT E
ATTACHMENT 4

include:

- Limit all stationary noise-generating equipment, such as air compressors and portable power generators to be no closer than 50 feet from residences.

- Muffle and maintain of all internal engines for construction equipment used on the site. At 50 feet, interior noise levels at residences would be reduced (with use of mufflers) to below 70 dBA. Exterior short-term noise levels would range from 75 to 80 dBA.

- Prohibiting unnecessary idling of internal combustion engines.

- Restrict the operation of chippers, chainsaws and other power-driven saw equipment within 300 feet of residences to the hours between 8 AM and 5 PM weekdays that are not legal holidays. A 300-foot buffer would ensure that noise from construction equipment would be attenuated by 16 dBA to comply with the County's 70 dBA Lmax goal. These 300-foot noise setbacks shall be shown on final plans and construction/bid documents.

- In the rest of the project area, hours of operation are restricted to weekdays 8 AM to 5 PM and Saturday operations, except log hauling and prolonged felling (greater than 2 hours), occurring from 9 AM to 5 PM. If weekend complaints are received from 40% of the residences within 300 feet, Saturday operations shall be discontinued.

- The operation of all other power equipment (including chippers), except licensed highway vehicles, within 300 feet of an occupied dwelling shall be restricted to weekdays between the hours of 8 AM and 5 PM and the hours between 9 AM and 5 PM and is prohibited on Sundays and legal holidays.

12. Impact AIR-1: Short-Term Air Quality Impacts. Dust emissions would be generated during construction of the proposed project. (Checklist Item E.2)

Mitigation Measure AIR-1: Final grading and erosion control plans shall include dust control measures in compliance with Monterey Bay Area Air Quality Management District (MBAAQMD) standard dust control measures. MBAAQMD dust control mitigation measures include the following:

- Water all active construction areas at least twice daily. Frequency should be based on the type of operation, soil and wind exposure;

- Prohibit all grading activities during periods of high wind (over 15 mph);

- Apply chemical soil stabilizers on inactive construction areas (disturbed lands within construction projects that are unused for a least four consecutive days);

EXHIBIT E
ATTACHMENT 4

- Apply non-toxic binders (e.g., latex acrylic copolymer) to exposed areas after cut and fill operations;
- Haul trucks shall maintain at least 2 feet of freeboard;
- Cover all trucks hauling dirt, sand or loose material;
- Cover inactive storage piles;
- Install wheel washers at the entrance to construction sites for all exiting trucks;
- Sweep streets if visible soil material is carried out from the construction site; and
- Post a publicly-visible sign which specifies the telephone number and person to contact regarding dust complaints. This person shall respond to complaints and take corrective action within 48 hours. The phone number of the Monterey Bay Unified Air Pollution Control District shall be visible to ensure compliance with Rule 402 (Nuisance).

13. Impact AESTH-1: Visual Impacts of Retaining Wall. Construction of the retaining wall near the Mt. Hermon water tank would create negative visual impacts by interrupting the natural appearance of the roadway at this location. (Checklist Item G.3)

Mitigation Measure AESTH-1: Because of its prominent location, the retaining wall at this location shall include architectural surface relief and be constructed from Fantasy Rock material, colored concrete, or other natural appearing material. The proposed wall design shall be reviewed by Planning staff to ensure consistency with visual resource protection policies of the County General Plan and Zoning Ordinance, consistent with General Plan Policy 5.10.15, prior to final project approval.

14 The loss of trees on both sides of the roadway would create a more open visual environment, as shown in the visual simulations (Attachments 8A and B), which could be considered to adversely affect the scenic quality of the roadway. (Checklist Item G.3) In order to mitigate this potential visual impact, prior to issuance of the grading permit, the applicant shall submit a revegetation plan prepared by a qualified biologist, for review and approval by Planning staff.. The revegetation plan shall include:

- Cut slopes higher than 5 feet shall be revegetated with native plants, including native trees, as well as grasses and shrubs, consistent with Mitigation Measures BIO-5;
- Coordination with any geotechnical analysis recommendations;
- A 3-year maintenance and monitoring program that specifies annual monitoring and remedial actions if the revegetation does not meet that plan's stated success standards (i.e., percent survival of planted trees).

EXHIBIT E
ATTACHMENT 4

The revegetation plan shall be initiated in the spring following construction activities. This schedule would allow the applicant time to procure/grow plant materials for the project, as needed. Revegetation activities are separate from erosion control measures, which shall be implemented immediately after construction, per Mitigation Measures BIO-5 and GEO-2.

15. Impact SERV-1. The proposed project would involve cut and fill operations that would result in 3,352 c.y. of excess cut material and stump removal operations that would generate stumps. (Checklist Item H.1)

    Mitigation Measure SERV-1: The applicant shall identify the receiving sites for fill and stumps at the pre-construction site meeting. Valid fill permits must be shown for any receiving site other than the municipal landfill.

16. In order to minimize traffic impacts caused by transport of logs and slash material, loaded logging trucks and trucks carrying slash shall be routed onto Mt. Hermon Road after exiting the project.

17. In order to minimize impacts from temporary road closures and detours, prior to issuance of the grading permit the applicant shall revise the Traffic Control Plan to include a provision that local emergency services providers be given advance notice of the closures so that they may plan for efficient emergency response.

18. Impact CUMU-1: Cumulative Short-Term Traffic Impacts. Installation of Graham Hill Road Showgrounds subdivision sewer lines and associated construction traffic could result in significant short-term impacts to traffic along Graham Hill Road, if that construction occurs concurrently with construction of the Graham Hill Road improvement project.

    Mitigation Measure CUMU-1: The County Public Works Department shall coordinate with the County Planning Department regarding construction schedules for these two projects. Should construction for these two projects occur simultaneously, prior to issuance of the grading permit, the applicant shall submit a traffic control plan that addresses and controls for the delays for the combined projects.

EXHIBIT E
ATTACHMENT 4

Overview of Changes to the Mitigation Monitoring Plan of Application 00-0368

1. The preconstruction meeting stands detailed in the original mitigations.

2. Impact GEO-1: Impacts to Slope Stability.
Implementation of the proposed project could result in slope instability.
Required mitigations have been completed.

   Geotechnical Report by Pacific Crest Engineering dated 11/2006.
   Review Letter dated 1/26/09.
   Final letter due upon completion of project.

3. Impact GEO-2: Impacts to Watercourses from Erosion. Construction of the proposed project could result in erosion into adjacent creeks and watercourses.
Required mitigations have been completed.

   Erosion Control Plan has been received, reviewed, and approved.

4. Impact HYDRO-1: Impacts to Water Quality. Increased erosion and sedimentation, if not properly controlled, could reduce water quality in the tributary and the mainstem of Zayante Creek. Grading and tree removal could increase suspended sediment and turbidity in receiving waters.

   Mitigations remain unchanged.

5. Impact BIO-1: Impacts to Nesting Raptors and Roosting Bats. Grading, construction, and vegetation removal along the project has the potential to impact nesting raptors and roosting bats.

   Mitigations remain unchanged.
   Construction schedule submitted

6. Impact BIO-2: Impacts to Mt. Hermon June Beetle. Grading, vegetation removal, vegetation trimming, and construction activities within the project area, even though the habitat is considered marginal, has the potential to impact this sensitive species if this work is done during the flight season (June - July) or if larvae are present on roots and are disturbed.

   Mitigations remain unchanged.

7. Impact BIO-3: Impacts to California Red-Legged Frog. Grading, construction and maintenance in and adjacent to the intermittent watercourses within the project work area have the potential to impact California red-legged frog, if individuals of this species are present in the area at the time of construction, impacts may occur through noise, dust and direct mortality.

EXHIBIT E

ATTACHMENT 5

13. Impact AESTH-1: Visual Impacts of Retaining Wall. Construction of the retaining wall near the Mt. Hermon water tank would create negative visual impacts by interrupting the natural appearance of the roadway at this location.

    This impact is not applicable as the retaining walls have been removed from the project.

14. The revegetation plan has been submitted, reviewed, and approved by the Planning Department.

15. Impact SERV-1. The proposed project would involve cut and fill operations that would result in 3,352 c.y. of excess cut material and stump removal operations that would generate stumps.

    Mitigations remain unchanged.

16. Traffic impact mitigations shall remain unchanged.

17. Traffic impact mitigations shall remain unchanged.

18. Impact CUMU-1: Cumulative Short-Term Impacts.

    This impact is no longer relevant as the Graham Hill Showgrounds subdivision sewer lines have been installed.

EXHIBIT E
ATTACHMENT 5

The revegetation plan shall be initiated in the spring following construction activities. This schedule would allow the applicant time to procure/grow plant materials for the project, as needed. Revegetation activities are separate from erosion control measures, which shall be implemented immediately after construction, per Mitigation Measures BIO-5 and GEO-2.

15. Impact SERV-1. The proposed project would involve cut and fill operations that would result in 3,352 c.y. of excess cut material and stump removal operations that would generate stumps. (Checklist Item H.1)

    Mitigation Measure SERV-1: The applicant shall identify the receiving sites for fill and stumps at the pre-construction site meeting. Valid fill permits must be shown for any receiving site other than the municipal landfill.

16. In order to minimize traffic impacts caused by transport of logs and slash material, loaded logging trucks and trucks carrying slash shall be routed onto Mt. Hermon Road after exiting the project.

17. In order to minimize impacts from temporary road closures and detours, prior to issuance of the grading permit the applicant shall revise the Traffic Control Plan to include a provision that local emergency services providers be given advance notice of the closures so that they may plan for efficient emergency response.

18. Impact CUMU-1: Cumulative Short-Term Traffic Impacts. Installation of Graham Hill Road Showgrounds subdivision sewer lines and associated construction traffic could result in significant short-term impacts to traffic along Graham Hill Road, if that construction occurs concurrently with construction of the Graham Hill Road improvement project.

    Mitigation Measure CUMU-1: The County Public Works Department shall coordinate with the County Planning Department regarding construction schedules for these two projects. Should construction for these two projects occur simultaneously, prior to issuance of the grading permit, the applicant shall submit a traffic control plan that addresses and controls for the delays for the combined projects.

EXHIBIT E

ATTACHMENT 5

Graham Hill Road Improvement Mitigation Monitoring and Reporting Program				
Environmental Impacts	**Mitigation Measures**	**Responsibility for Compliance**	**Method of Compliance**	**Timing of Compliance**
Geology/Soils				
GEO-1: Impacts to slope stability	A final soils letter shall be submitted to the planning department confirming that the project was implemented as designed and approved.	DPW Project Engineer	Letter submittal	Post construction
Hydrology/Water Supply/Water Quality				
HYDRO-1: Impacts to water quality	The erosion control plan shall be implemented as approved.	DPW Inspector, EP Staff	Preconstruction meeting review of erosion control plan features and ongoing inspections during construction.	Preconstruction and ongoing throughout the project implementation.
	The refueling and staging areas shall be located outside of the riparian corridor.	Contractor and DPW Inspector	Preconstruction meeting confirmation of staging area location and ongoing monitoring by the DPW inspector.	Preconstruction and ongoing throughout the project implementation.
Biological Resources				
BIO-1:Impacts to nesting raptors and roosting bats	Schedule tree removal for outside of both raptors and bats, as proposed in the submitted Construction Table	DPW Project Engineer	Pre-construction meeting confirmation and monitoring during construction	Preconstruction and ongoing throughout the project implementation.
BIO-2: Impacts to Mt. Herman June Beetle and its Habitat	Obtain and adhere to all terms and conditions set forth in the US Fish and Wildlife Service (USFWS) Section 7 consultation for the Mt Herman June Beetle.	DPW Project Engineer and DPW Inspector	Review measures at pre-construction meeting.	Preconstruction and ongoing throughout the project implementation.
	Purchase credits from the Zayante Sandhills Conservation Bank, as approved by the Board of Supervisors 1/13/09	DPW Project Engineer	Documentation of credits shall be presented at the preconstruction meeting	Preconstruction
BIO-3: Impacts to California Red-Legged Frog	Obtain and adhere to all terms and conditions set forth in the US Fish and Wildlife Service (USFWS) Section 7 consultation for the California Red-Legged Frog.	DPW Project Engineer and DPW Inspector	Review measures at pre-construction meeting.	Preconstruction and ongoing throughout the project implementation.

EXHIBIT E

EXHIBIT E ATTACHMENT

Graham Hill Road Improvement Mitigation Monitoring and Reporting Program				
Environmental Impacts	**Mitigation Measures**	**Responsibility for Compliance**	**Method of Compliance**	**Timing of Compliance**
BIO-4: Impacts to Waters of the US, Including Wetlands and Other Waters	Prior to any site disturbance, the applicant shall demark the outer limit of the construction area with temporary fencing. Where construction occurs near culverts or adjacent to drainages or riparian woodlands, the applicant shall install silt containment devices (i.e., silt fencing or straw bales or wattles) along the bottom edge of the fencing. The fencing shall be in place prior to the pre-construction meeting. The integrity of the fence shall be regularly inspected during the construction period to ensure the riparian habitat/waterways are not inadvertently impacted. Post Construction: all silt shall be removed from the silt containment devices prior to their removal. The approved permanent erosion control and restoration plan shall be implemented.	Contractor and DPW Inspector	Review fencing at pre-construction meeting. Final installation of the restoration plan shall be reviewed by Environmental Planning staff prior to final payout of the contract.	Preconstruction and ongoing throughout the project implementation.
BIO-5: Impacts to Riparian Woodland Habitat	The riparian restoration plan shall be implemented as approved. All tree and native vegetation shall be limited to the minimum amount necessary and shall be conducted under the supervision of the project arborist.	Contractor, DPW Inspector and Environmental Planning Staff	Requirements shall be reviewed at the preconstruction meeting. Final installation of the restoration plan shall be reviewed by Environmental Planning staff prior to final payout of the contract.	Preconstruction and ongoing throughout the project implementation.
BIO-6: Impacts to Native Trees to be Retained	The project arborist shall supervise all trenching and other excavation that occurs within the drip line of trees to be retained. The arborist shall implement root protection measures to ensure the health and vigor of the trees as necessary.	DPW Inspector	Requirements shall be reviewed at the preconstruction meeting. The DPW inspector shall coordinate with the contractor and arborist to ensure the arborist is present as required.	Preconstruction and ongoing throughout the project implementation.
EXHIBIT E ATTACHMENT 6	Roots cut during excavation or trenching activities, especially in the top three feet of surface soil, shall be irrigated and wrapped in burlap. The burlap shall be kept moist and in place until the roots are backfilled with soil similar in texture to the soil removed, and imported fill shall only be used if the stockpiled, un-amended soil is not available.	DPW Inspector	Requirements shall be reviewed at the preconstruction meeting. The DPW inspector shall coordinate with the contractor and arborist to ensure the arborist is present as required.	Preconstruction and ongoing throughout the project implementation.
	Pruning of trees shall be done according to International Society of Arboriculture standards under	DPW Inspector	Requirements shall be reviewed at the preconstruction	Preconstruction and ongoing

Graham Hill Road Improvement Mitigation Monitoring and Reporting Program				
Environmental Impacts	**Mitigation Measures**	**Responsibility for Compliance**	**Method of Compliance**	**Timing of Compliance**
	the direction of the project arborist. Excessive pruning shall be avoided and small branches shall be retained wherever feasible without compromising safety.		meeting. The DPW inspector shall coordinate with the contractor and arborist to ensure the arborist is present as required.	throughout the project implementation.
	Where surface grades are modified, water shall drain away from tree trunks in a manner similar to preconstruction conditions.	DPW Inspector	Requirements shall be reviewed at the preconstruction meeting. The DPW inspector shall coordinate with the contractor and arborist to ensure the arborist is present as required.	Preconstruction and ongoing throughout the project implementation.
	Vehicles, machinery and equipment shall not be parked or stored within the drip line of any trees or shrubs at any time. If construction equipment absolutely must operate under the drip line of trees to be retained, the equipment shall operate on double, overlapping thick sheets of plywood placed on top of the protective layer of mulch.	DPW Inspector	Requirements shall be reviewed at the preconstruction meeting. The DPW inspector shall regularly monitor the jobs site and vehicle locations.	Preconstruction and ongoing throughout the project implementation.
	The applicant shall be responsible for implementing a 3-year tree maintenance and monitoring program wherein the project arborist shall periodically inspect the retained trees. The applicant shall implement remedial actions if the trees exhibit significant decline in health and vigor, under the direction of the project arborist.	DPW Project Engineer	Annual review of the retained trees and restoration plan by DPW and Environmental Planning Staff	Post construction.
Transportation/Traffic				
TRAN-1: Impacts of Log and Slash Removal.	Loaded logging trucks shall be required to exit the project area by way of Mount Herman Road and shall not be allowed on Graham Hill south of the project limits.	DPW Inspector	Requirement shall be reviewed at the preconstruction meeting and monitored by the DPW Inspector	Preconstruction and ongoing throughout the project implementation.
Impacts to Emergency Services	Prior to any road closures, the project applicant shall notify all local emergency service providers.	DPW Project Engineer	The list of local emergency service providers shall be reviewed at the preconstruction meeting and the DPW or Contractor staff responsible for	Preconstruction and ongoing throughout the project implementation.

EXHIBIT H
ATTACHMENT 6

Graham Hill Road Improvement Mitigation Monitoring and Reporting Program				
Environmental Impacts	**Mitigation Measures**	**Responsibility for Compliance**	**Method of Compliance**	**Timing of Compliance**
			notification shall be determined.	
Noise				
NOI-1: Short Term Noise Impacts	All stationary noise-generating equipment (generators, air compressors, etc.) shall be located at least 50 feet from all residences.	DPW Inspector	Identify location of residences in the project vicinity and monitor ongoing construction activities	Preconstruction and ongoing throughout the project implementation.
	Internal engines shall all be muffled and shall not be allowed to idle unnecessarily.			
	Chippers, chainsaws, and other power-driven saw equipment shall not be operated within 300 feet of residences before 8AM or after 5PM on regular non-holiday weekdays.			
	Hours of operation shall be 8-5 weekdays and 9-5 Saturdays. If complaints are received by more than 40% of the residences within 300 feet of the project, Saturday operations shall be discontinued.			
Air Quality				
AIR-1: Short-term Air Quality Impacts	Dust shall be monitored at all times: 1. Grading shall not be allowed if winds in the project area exceed 15 mph. 2. Active grading areas shall be watered at least twice per day. 3. Inactive construction areas (no activity for 4 or more days) shall be stabilized with chemical soil stabilizers. 4. Haul trucks shall maintain a minimum 2 feet freeboard and shall be covered. 5. Inactive stockpiles shall be covered. 6. Streets shall be swept as necessary to prevent soil from tracking out of the project area. 7. A publicly visible sign shall be posted with the name and number of the contact person to receive complaints regarding dust, and action			

ATTACHMENT 6 - EXHIBIT E

Graham Hill Road Improvement Mitigation Monitoring and Reporting Program				
Environmental Impacts	**Mitigation Measures**	**Responsibility for Compliance**	**Method of Compliance**	**Timing of Compliance**
	shall be taken within 48 hours of any complaint received. The sign shall also include the phone number for the Monterey Bay Unified Air Pollution Control District.			
Public Services and Utilities				
SERV-1: Excess fill and stumps	The applicant shall identify the receiving sites for stumps and fill at the preconstruction meeting. Valid grading permits must be shown for any receiving site other than a landfill.	DPW Project Engineer	Environmental Planning Staff shall review grading permits at preconstruction meeting.	Preconstruction meeting

EXHIBIT E
ATTACHMENT 6

Graham Hill Road Improvement Project

Addendum to Biological Assessment

No. 1-8-04-F-59

Federal Project No. RPSTPL 5936 (033)

Graham Hill Road Improvement Project, Santa Cruz County
Roaring Camp Road – Climbing Lane
District 5

January 19, 2009

Caltrans

EXHIBIT F

Summary of Findings, Conclusions and Determinations

The Graham Hill Road Improvement Project, Roaring Camp Road – Climbing Lane, 2008 Design is proposed along a 0.64-mi section of roadway east of the town of Felton and west of the Juvenile Probation Center in the County of Santa Cruz. The majority of the project area is comprised of redwood and mixed evergreen forest, with small amounts of riparian woodland and in-channel wetlands. A Natural Environment Study (NES) was prepared for the 2000 Project Design in 2004 and a Biological Opinion was issued by the USFWS in 2005. Since then, revisions to the project design have occurred and, as such, the County has re-analyzed potential effects of the 2008 Project on biological resources. This Addendum to the Biological Assessment includes an updated project description, identifies temporary and permanent impacts to biological resources and quantifies the area of disturbance relative to identified endangered species. Measures to mitigate adverse effects on endangered species are also identified.

The proposed 2008 Project utilizes the same project area as the 2000 Project Design, yet several project features have changed. Left turn lane pockets at Grand View and Summit Aves., as well as 165 feet of retaining wall have been eliminated from the 2008 design. The overall scope and size of storm drain improvement are similar between the two plans, yet the 2008 design reduces roadway excavation amounts and retains an old growth redwood tree.

Roadway and drainage improvements for the 2008 design will affect approximately 130 sq. ft of in-stream wetlands and approximately 836 sq. ft of other jurisdictional waters. Project improvements will also affect approximately 500 sq. ft of riparian woodland. This is a decrease in impacts compared to the 2000 design plan.

A portion of the project area is identified as supporting Zayante sandhills substrate. Sandy soil was found to extend from Summit Avenue (Sta. 32+75) westward to the project terminus (Sta. 44+00). Although the project area was not found to support sandhills vegetation (i.e., maritime chaparral and/or ponderosa pine forest) and the sandy habitat is considered marginal for endangered species, sandy substrate soil may still be present, including below invasive plant species, such as French broom. The 2004 NES identified project construction effects on Mt. Hermon June beetle habitat as approximately 1,200 sq. ft based on the observation of one beetle in a grassy patch at Summit Avenue. The 2008 analysis uses a more conservative interpretation of project impacts to sandhill soil substrate, such that Mt. Hermon June beetles could potentially be present within approximately 0.54 ac of the project's construction area, however; no additional effects on the Mt. Hermon June beetle are anticipated with the 2008 Project. Consistent with findings in the 2004 NES, the 2008 Project will have no effect on the Zayante band-winged grasshopper, Ben Lomond spineflower, or Santa Cruz wallflower.

EXHIBIT F

As presented in the 2004 NES, grading, vegetation removal, vegetation trimming, and construction activities within the sandy soil areas has the potential to impact the Mt. Hermon June beetle, including 0.54 acre of its habitat.

To mitigate the loss of habitat the County will implement on-site revegetation of 0.38 acre creating habitat suitable for the beetle (3:1 ratio) and purchase of 0.41 conservation credit for the beetle from the USFWS-approved Zayante Sandhills Conservation Bank (1:1 ratio). Total habitat mitigation is 0.79 acre (1.46:1 mitigation/impact ratio).

Section 7 consultation between the FHWA and USFWS is required since project construction, including implementation of mitigation measures (i.e., on-site revegetation) is "likely to adversely affect" this species. These measures were outlined in the 2005 Biological Opinion. To avoid encountering dispersing adult Mt. Hermon June beetles, the work associated with the project and mitigation measures should not be allowed during the adult activity season (mid-May through mid-August) during the hours when male beetles are known to be active (between 7:00 p.m. and 7:00 a.m.). Additionally, a qualified entomologist should serve as a biological monitor during ground-disturbing activities of the project and during ground-disturbing activities associated with project mitigation (i.e., on-site revegetation). Specific capture and relocation measures, as outlined in the 2005 Biological Opinion, will be followed for all June beetles encountered during construction and mitigation activities. In the event that Mount Hermon June beetles are found dead or injured during project activities, FHWA, Caltrans or the County shall immediately notify USFWS. USFWS will determine whether additional protective measures are warranted.

Impacts and mitigation measures relating to the Mt. Hermon June beetle are outlined in this Addendum to the Biological Assessment. Successful implementation of these mitigation measures would reduce or eliminate adverse effects of the proposed 2008 Project on this species.

EXHIBIT F

Graham Hill Road Improvement Project

Natural Environment Study

Santa Cruz County, CA

Updated August 18, 2004

Approved By: _____ Date: 8/26/04

Bill Williamson, P.E.
Phone Number (831) 454-2807
Department of Public Works
County of Santa Cruz

Approved By: _____ Date: 8/27/04

Gary Ruggerone, Senior Environmental Planner
Phone Number (805) 549-3182
District 5 Environmental Planning Branch
California Department of Transportation

Note: This NES has been updated from a version that was prepared by the County of Santa Cruz and submitted to Caltrans in 2000. The format of the 2000 NES has been retained and therefore does not follow current NES formatting requirements.

EXHIBIT F

GRAHAM HILL ROAD IMPROVEMENT PROJECT
SANTA CRUZ COUNTY, CALIFORNIA

NATURAL ENVIRONMENT STUDY

I. SUMMARY OF FINDINGS AND CONCLUSIONS

The Graham Hill Road Improvement Project (Revised Plan, dated November 4, 2002) is proposed along a 1.03-kilometer (0.64-mile) section of roadway east of the town of Felton and west of the Juvenile Probation Center in the County of Santa Cruz. The majority of the project area is comprised of redwood and mixed evergreen forest, with small amounts of riparian woodland and seasonal wetlands.

Construction of the roadway improvement project would include widening and other roadway improvements adjacent to three unnamed intermittent tributaries to Zayante Creek. A culvert is proposed into one of the intermittent tributaries of Zayante Creek at the northern terminus of the project work area. A portion of the road widening activities would occur within the streambed of a watercourse and within areas of wetlands. Approximately 13.5 square meters (145 square feet) of wetlands and approximately 166.4 meters (546 feet) of other jurisdictional waters would be affected. Therefore, the project will result in impacts to Waters of the United States. A preliminary wetland delineation was prepared in 2000 and is included in Appendix A. Roadway improvements will also affect approximately 69.2 square meters (745 square feet) of riparian woodland.

Impacts and mitigation measures are outlined in this Natural Environment Study (NES). Successful implementation of the mitigation measures, as outlined in this NES, would reduce or eliminate adverse effects of the proposed project on biotic resources.

A. POTENTIAL EFFECTS ON SPECIAL STATUS SPECIES

1. California Red-legged Frog

The intermittent watercourses in the project area have no suitable potential breeding habitat for the California red-legged frog (RLF), a federally-listed threatened species, due to the lack of ponded areas with deep water and lack of emergent vegetation; however, frogs may periodically travel through the area and may be affected by project construction activities. Therefore, mitigation measures are identified in the NES to avoid adverse effects to this species during project construction. The use of the roadway following construction would not result in adverse effects to the frog.

Informal Section 7 consultation between CalTrans (on behalf of the Federal Highway Administration [FHWA]) and U. S. Fish and Wildlife Service (USFWS) would be required for concurrence with a finding of "not likely to adversely affect" this species, with the implementation of recommended avoidance measures (e.g., conduct work when intermittent streams are dry and conduct pre-construction surveys). A programmatic Biological Opinion, for FHWA projects that may affect the RLF has been issued by the USFWS. The Biological Opinion authorizes projects that are designed and implemented in such a way as to minimize adverse impacts to the RLF and their habitat. Specific measures are identified in the Biological Opinion,

such as pre-construction surveys, worker awareness training, on-site monitoring, trash and debris control, and construction scheduling, that are to be implemented to avoid and/or minimize impacts.

The Graham Hill Road Improvement project is not within a proposed critical habitat unit for California red-legged frog.

2. Steelhead and Coho Salmon

Construction of the project has the potential to affect aquatic resources, including steelhead and Coho salmon (two federally listed species) within Zayante Creek, downstream of the project work area. However, mitigation measures, such as construction management and erosion control features, however, have been identified to avoid any indirect effects to these aquatic wildlife species. Special status species (i.e., steelhead or Coho salmon) are not considered likely to occur in the project work area due to inadequate habitat (e.g., intermittent flows and lack of spawning gravels) and a lack of migration corridor. Due to lack of fish habitat and passage, there would be no effect on these species. In addition, no pools will require dewatering during the construction period. The Graham Hill Road Improvement project will have no effect on Coho salmon critical habitat or essential fish habitat.

3. Mt. Hermon June Beetle

A survey in July 1999 found one Mt. Hermon June beetle (one adult male), a federally listed species, near the intersection of Summit Avenue and Graham Hill Road (Entomological Consulting Services, Ltd., 1999 and 2004). This Mt. Hermon June beetle was found in a trap located east of Summit Avenue along the north side of Graham Hill Road. This individual was a dispersing male (females do not fly), as the vegetation at this location and throughout most of the road improvement project area is not breeding habitat for this species (Entomological Consulting Services, Ltd., 2004). The trap location lies within the work area of the road improvement project; the site is surrounded by a dense stand of French broom. There are scattered ponderosa pine trees on the north side of Graham Hill Road between Summit Avenue and the eastern terminus of the project site that may support marginal habitat for this species. The nearest ponderosa pine is located at least 61 meters (200 feet) from the boundaries of the road improvement project area. Roots of mature ponderosa pines may extend as far as 45.7 meters (150 feet) from the trunk in loose sandy soils. Eggs, larvae, and pupae of the Mt. Hermon June beetle are associated with the roots of ponderosa pines. Roots of ponderosa pines are not likely to extend into the project work area where grading or other ground-disturbing activities will occur; therefore, immature stages of the beetle are not likely to be affected by the project.

Although the habitat within the project area boundaries is considered marginal, sandy substrate soil may still be present below invasive plant species, such as the French broom. Therefore, Mt. Hermon June beetles could potentially be present within the project's construction area. Grading, vegetation removal, vegetation trimming, and construction activities within the areas with sandy soils (i.e., from Summit Avenue uphill to the project terminus at the bottom of the slow lane) has the potential to impact this species (Entomological Consulting Services, Ltd., 2002). Project construction will affect approximately 111.5 square meters (1,200 square feet) of Mt. Hermon

June beetle habitat (this habitat is not considered suitable breeding habitat for the beetle). There is no suitable breeding habitat for the beetle within the project limits. Measures to mitigate the loss of habitat have been identified (i.e., removal of invasive nonnative plant species from occupied beetle habitat at the nearby County of Santa Cruz Juvenile Detention Facility). Section 7 consultation between the FHWA and USFWS is required since the project is "likely to adversely affect" this species. To avoid encountering dispersing adult Mt. Hermon June beetles, the work associated with the project should not be allowed during the adult activity season (mid-May through mid-August) during the hours when male beetles are known to be active (between 7:00 p.m. and 7:00 a.m.). Additionally, a qualified entomologist should serve as a biological monitor during ground-disturbing activities of the project to identify any life stages of the Mt. Hermon June beetle.

4. Breeding Raptors, Bats and Birds Protected under the Migratory Bird Treaty Act

Project construction also has the potential to affect raptor, and other bird breeding and bat breeding, if they are nesting in the project area. Lactating female Yuma myotis were observed in the project area during July 2000 bat surveys, indicating that this species is reproducing in the area (Heady, 2000). Measures to avoid impacting nesting special status raptors, birds protected under the Migratory Bird Treaty Act and bats have been identified (i.e., pre-construction surveys and restriction of construction period).

B. POTENTIAL EFFECTS ON BIOTIC RESOURCES AND SENSITIVE HABITATS

Construction of the road improvement project would result in the removal of 185 trees greater than 10.2 centimeters (4 inches) in diameter (measured at breast height [DBH]) may be removed. The majority of the trees are tan bark oaks (*Lithocarpus densiflorus*), with lesser amounts of coast redwood (*Sequoia sempervirens*), Douglas fir (*Pseudostuga menziesii*), California bay (*Umbellularia californica*), coast live oak (*Quercus agrifolia),* buckeye (*Aesculus californica*), black cottonwood (*Populus balsamifera ssp. tricocarpha)* and big leaf maple (*Acer macrophyllum*). Several trees will also require limbing prior to construction work to remove branches of these trees that extend into the construction zone. The project Tree Removal Report (Staub Forestry and Environmental Consulting, 2/2000 and updated by Santa Cruz County in 2002) identifies each of the trees to be removed. This report is included as Appendix B of the NES.

With the exception of riparian trees (i.e., black cottonwood), the proposed roadway improvement project does not propose to implement a tree replacement program to provide compensation for the removal of the native trees. Mitigation Measure No. 14 specifies a 3:1 riparian habitat (including trees) replacement ratio that will be implemented on County-owned lands in the project area.

The County of Santa Cruz determined that the loss of the 185 trees to be displaced by the project is a visual impact and is not considered a significant biological resources impact under the California Environmental Quality Act (CEQA). Therefore, Mitigation Measure No. 14 (12/7/00 Staff Report to the County Board of Supervisors, Exhibit C) will be implemented to mitigate the visual impact of removing 185 trees. Mitigation Measure No. 14 proposed planting native shrubs and native grasses (no trees). However, some trees may be planted above the top of the slope if there is adequate space (to be determined by the County during the Plans, Specifications, and Estimates [PS&E] phase of the project) and specified in the grading permit.

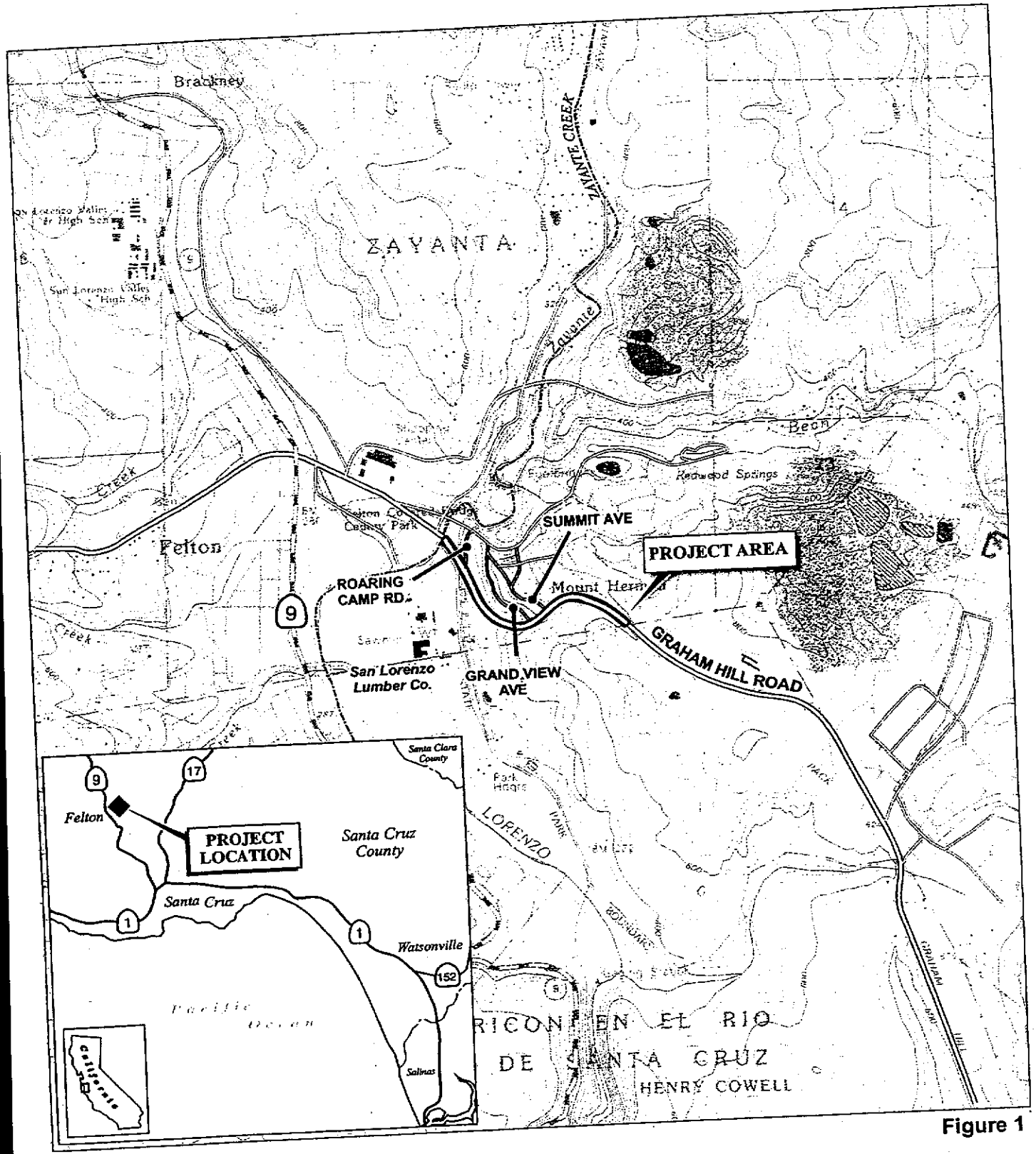


Figure 1

Graham Hill Road Improvement
Natural Environment Study
Project Location

N

0 2000
FEET

SOURCE: USGS 7.5' QUAD - FELTON, CALIF. 1995 (PR-1980)

I:\SCC930\G\ProjLoc.cdr (6/24/03)

EXHIBIT F

Construction of the roadway improvement project would include widening and other roadway improvements adjacent to three unnamed tributaries to Zayante creek. A culvert is proposed into one tributary of Zayante Creek at the northern terminus of the project work area. A portion of the roadway improvement project would occur within the streambed of a watercourse and within areas of wetlands. Approximately 166 meters (546 feet) of other waters and 13.5 square meters (145 square feet) of wetlands would be affected by the project.

C. REQUIRED PERMITS AND APPROVALS

A series of project permits, approvals and determinations of project consistency would be required for the proposed project. In addition to compliance with the CEQA and the National Environmental Policy Act (NEPA), and approval of associated documentation, the following permits and approvals would be required relative to natural resources:

- Consultation between Caltrans (on behalf of FHWA) and USFWS would be required to reach concurrence on avoidance and minimization measures for federally listed species (e.g., California red-legged frog and Mt. Hermon June beetle). Specific measures for these species include:
    - Prior to issuance of a grading permit, the County shall obtain a Section 7 biological opinion from USFWS for Mt. Hermon June beetle. To avoid taking this species, all terms and conditions stipulated by USFWS during the Section 7 consultation shall be implemented.
    - Prior to issuance of a grading permit, Caltrans (on behalf of FHWA) shall initiate Section 7 consultation with USFWS regarding potential effects to California red-legged frogs (CRLF) that may be present in the project area. No work shall occur that could result in adverse effect to the species until use of the USFWS/FHWA programmatic Biological Opinion has been approved for use on this project. To avoid taking this species, all terms and conditions stipulated by USFWS during the Section 7 consultation shall be implemented.
    - To avoid potential impacts to frogs, implement minimization measures, as identified in the CRLF "Programmatic Biological Opinion for Projects Funded or Approved under the Federal Aid Program" dated April 24, 2003, as issued by the USFWS for FHWA funded projects. These measures specify scheduling construction when all streams and culverts are dry. If this is not possible, surveys shall be conducted for red-legged frogs immediately prior to construction at the culvert of the tributary to Zayante Creek and other work areas adjacent to the intermittent drainages. The recommended survey would be conducted within 48 hours prior to construction and include the creek extending 0.8 kilometer (0.5 mile) upstream and downstream of the proposed project area.
    - To avoid potential impacts to frogs, the size of the work area shall be limited to the smallest areas possible; pets shall not be allowed on the project site; and mechanical equipment shall be parked and serviced, and construction materials stored, in designated staging areas that are located outside the creek bed. Before any construction activities begin, a qualified biologist shall conduct a training session for all construction personnel. At a minimum, the training shall include a description of the California red-legged frog and its habitat, general measures that are to be implemented to conserve the species,

as it relates to this project, and the boundaries within which the project may be accomplished. During project activities, all trash that may attract predators shall be properly contained, removed from the work site and disposed of regularly.

- If a California red-legged frog is observed on the site prior to or during project activities, both Caltrans (on behalf of FHWA) and the USFWS shall be notified immediately, and all work must cease until a Biological Opinion has been issued by the USFWS. If the USFWS approves moving the animals, a USFWS-approved biologist shall be allowed sufficient time to move the animals before work activities resume. A USFWS-approved biologist shall be present at the work site until such time as all removal of California red-legged frogs, instruction of workers, and habitat disturbance have been completed. After this time, the County shall designate a person to monitor on-site compliance with all minimization measures. If work is stopped, the USFWS shall be notified immediately by the USFWS-approved biologist or the on-site biological monitor.
- Work associated with the project should not be allowed during the adult activity season for the Mt. Hermon June beetle (mid-May through mid-August) during the hours when male beetles are known to be active (between 7:00 p.m. and 7:00 a.m.). Additionally, a qualified entomologist should serve as a biological monitor during ground-disturbing activities of the project to identify any life stages of the Mt. Hermon June beetle.
- Mitigate the loss of Mt. Hermon June beetle habitat through the removal of invasive nonnative plant species (i.e., Portuguese broom) from occupied beetle habitat at the nearby County of Santa Cruz Juvenile Detention Facility.

- A Section 404 permit from the U.S. Army Corps would be required to authorize fill in Waters of the Unites States.
- A Streambed Alteration Agreement with the California Department of Fish and Game CDFG) (Sections 1601–1603 State Fish and Game Code) would be required for placement of the new culvert at the tributary to Zayante Creek and construction work along the intermittent drainages within the project area.
- Approval of a conversion exemption would be required from the California Department of Forestry and Fire Protection (CDF).
- A Section 401 Water Quality Certification or Waiver of Certification and a National Pollution Discharge Elimination Permit and associated Notice of Intent and Storm Water Pollution Prevention plan would be required from the Regional Water Quality Control Board (RWQCB).
- A riparian exception from the County would be required for disturbance of riparian habitat and construction work within 9.1 meters (30 feet) of an intermittent stream.
- A riparian exception from the County would be required for the fill of a watercourse and wetlands.

Section 7 determinations based on the information presented in this Natural Environment Study are as follows:

- **US Fish and Wildlife Service:**
  California red-legged frog—not likely to adversely affect
  Mount Hermon June beetle—likely to adversely affect
  Zayante band-winged grasshopper—no effect on the species and its critical habitat