

JOHN A. FANTHAM
DIRECTOR OF PUBLIC WORKS

County of Santa Cruz

DEPARTMENT OF PUBLIC WORKS

701 OCEAN STREET, ROOM 410, SANTA CRUZ, CA 950604070
(931) 454-2160 FAX (931) 454-2385 TDD (831) 454-2123

AGENDA: JUNE 22, 1999

June 16, 1999

SANTA CRUZ COUNTY BOARD OF SUPERVISORS

701 Ocean Street
Santa Cruz, California 95060

SUBJECT: BRANCIFORTE CREEK HOMES PROTECTION
EMERGENCY WATERSHED PROTECTION PROGRAM

Members of the Board:

Significant stream bank erosion that occurred last winter along Branciforte Creek approximately 400 feet upstream of the Isbel Drive bridge poses an imminent threat of damage to homes adjacent to the creek and a City of Santa Cruz sanitary sewer facility. The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) prepared a Damage Survey Report (DSR) (attached Exhibit "A") which qualified the project for funding under the NRCS Emergency Watershed Protection Program (EWP).

NRCS has estimated the construction cost to be \$250,000 and will fund 75% of this (\$187,500) plus 8% (\$20,000) for engineering and inspection (see attached cooperative agreement, Exhibit "B"). Since the erosion damage is not connected with a declared emergency, none of the remaining local share is eligible for funding from the Office of Emergency Services (OES). The remaining local share and other project associated costs not eligible for reimbursement by the NRCS, OES, or others will be **funded** by the Branciforte Creek property owners, per the Emergency Watershed Protection Program (EWP) local share policy considered by your Board at its regular June 15, 1999, meeting.

The total estimated project cost including surveying, engineering, construction, inspection, permitting, and overhead is estimated at \$284,000, of which \$207,500 will be funded by NRCS and the remaining \$76,500 **funded** by the property owners and by the City of Santa Cruz.

74

Public Works staff has met with the affected property owners and the City of Santa Cruz regarding entering into agreements to fund the local share costs. The agreements (see attached Exhibit "C"), which follow the at-cost standard format presented to your Board on June 15, 1999, as part of the County's EWP local share policy, have not yet been executed by the property owners. Local sponsorship of the project by the County will be contingent upon the agreements being concluded. The agreements also call for the County to select a design professional for the project. The agreement includes a release of liability in favor of the County. In order to expedite the project, we will need your Board's authorization to sign an Independent Contractor Agreement for design for the project.

In order to **qualify** for the grant funding the project must be completed this fall. A topographic survey, final project design and plans and specifications need to be completed as soon as possible. Emergency bidding and contract award procedures, as well as expedited permits may be needed.

It is therefore recommended that the Board of Supervisors take the following action:

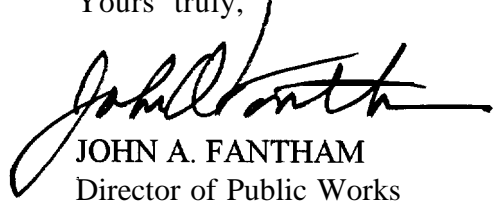
1. Authorize the County, through the Public Works Department, to act as the local sponsor for the Branciforte Creek Homes Protection Project, contingent upon execution of the agreements with the Branciforte Creek property owners and the City of Santa Cruz to fund 100% of the local share costs.
2. Authorize the Director of Public Works to sign the cooperative agreement with the NRCS.
3. Authorize execution of the agreements with the Branciforte Creek property owners and the City of Santa Cruz.
4. Authorize the Director of Public Works to sign an Independent Contractor Agreement for design for the project.
5. Adopt the resolutions accepting unanticipated revenue into the 1999/00 fiscal year in the amount of \$207,500 from the NRCS and \$76,500 from the property owners and the City of Santa Cruz.
6. Direct the County Planning Department to expedite the permitting process,

SANTA CRUZ COUNTY BOARD OF SUPERVISORS

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7. Authorize the use of emergency bidding and contract award procedures (requires a unanimous vote).

Yours truly,

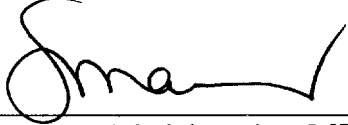


JOHN A. FANTHAM
Director of Public Works

GG: bbs

Attachments

RECOMMENDED FOR APPROVAL



County Administrative Office

Copy to: Planning Department
Public Works Department

BCHB

FY 1999/2000

BEFORE THE BOARD OF SUPERVISORS OF THE COUNTY OF SANTA CRUZ, STATE OF CALIFORNIA

RESOLUTION NO. _____

On the motion of Supervisor _____
duly seconded by Supervisor _____
the following resolution is adopted:

RESOLUTION ACCEPTING UNANTICIPATED REVENUE

WHEREAS, the County of Santa Cruz is a recipient of funds from United States Department of Agriculture Natural Resources Conservation Service for the Branciforte Creek Homes Protection Program; and

WHEREAS, the County is a recipient of funds in the amount of \$207,500.00 which are either in excess of those anticipated or are not specifically set forth in the current fiscal year budget of the County; and

WHEREAS, pursuant to Government Code Sections 29130(c), 29064(b), such funds may be made available for specific appropriation by a four-fifths vote of the Board of Supervisors;

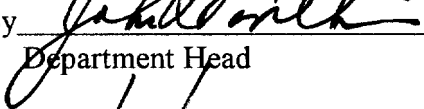
NOW, THEREFORE, BE IT RESOLVED AND ORDERED that the Santa Cruz County Auditor-Controller accept funds in the amount of \$207,500.00 into Public Works Department

Index No. 601000 Revenue Subobj ect No. 1062

and that such funds be and are hereby appropriated as follows:

<u>INDEX NO.</u>	<u>ACCOUNT NO.</u>	<u>PRJ/UCD</u>	<u>ACCOUNT NAME</u>	<u>AMOUNT</u>
601000	3590		DPW-Internal Service Fund	\$207,500

DEPARTMENT HEAD: I hereby certify that the fiscal provisions have been researched and that the Revenue(s) (has been) (will be) received within the current fiscal year.

By 
Department Head
Date 6/14/99

COUNTY ADMINISTRATIVE OFFICER /-/Recommended to Board

//Not Recommended to Board

PASSED AND ADOPTED by the Board of Supervisors of the County of Santa Cruz, State of California, this o day f, 1999, by the following vote (requires four-fifths vote approval):

AYES: SUPERVISORS

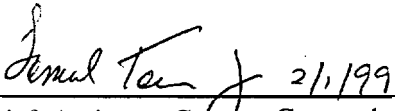
NOES: SUPERVISORS

ABSENT: SUPERVISORS

Chairperson of the Board

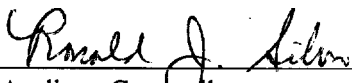
ATTEST: _____
Clerk of the Board

APPROVED AS TO FORM:

 2/1/99
Chief Assistant County Counsel

APPROVED

AS TO ACCOUNTING DETAIL:

 6/15/99
Auditor-Controller

Distribution: Auditor-Controller
Public Works Department

FY 1999/2000

BEFORE THE BOARD OF SUPERVISORS OF THE COUNTY OF SANTA CRUZ, STATE OF CALIFORNIA

RESOLUTION NO. _____

On the motion of Supervisor _____
duly seconded by Supervisor _____
the following resolution is adopted:

RESOLUTION ACCEPTING UNANTICIPATED REVENUE

WHEREAS, the County of Santa Cruz is a recipient of funds from Branciforte Creek Property Owners for the Branciforte Creek Homes Protection Program; and

WHEREAS, the County is a recipient of funds in the amount of \$76,500.00 which are either in excess of those anticipated or are not specifically set forth in the current fiscal year budget of the County; and

WHEREAS, pursuant to Government Code Sections 29130(c), 29064(b), such funds may be made available for specific appropriation by a four-fifths vote of the Board of Supervisors;

NOW, THEREFORE, BE IT RESOLVED AND ORDERED that the Santa Cruz County Auditor-Controller accept funds in the amount of \$76,500.00 into Public Works Department

Index No. 601000 Revenue Subobject No. 2384

and that such funds be and are hereby appropriated as follows:

<u>INDEX NO.</u>	<u>ACCOUNT NO.</u>	<u>PRJ/UCD</u>	<u>ACCOUNT NAME</u>	<u>AMOUNT</u>
601000	3590		DPW-Internal Service Fund	\$76,500

DEPARTMENT HEAD: I hereby certify that the fiscal provisions have been researched and that the Revenue(s) (has been) (will be) received within the current fiscal year.

By 
Department Head

Date 6/14/99

ABSENT: SUPERVISORS

ATTEST: _____
Clerk of the Board

Samuel Tan 2/1/99
Chief Assistant County Counsel

Ronald J. Silver 6/15/99
Auditor-Controller

AUD60.DOC
(1/99)

EMERGENCY WATERSHED PROTECTION
DAMAGE SURVEY REPORT

FOR

BRANCIFORTE CREEK HOMES PROTECTION
DSR NO. 01-99-0117
SANTA CRUZ COUNTY, CALIFORNIA

Sponsored By:

City of Santa Cruz
809 Center Street, Room 201
Santa Cruz, California 95060

County of Santa Cruz
Department of Public Works
701 Ocean Street, Room 410
Santa Cruz, California 95060

Prepared By:

USDA, Natural Resources Conservation Service
5161 Soquel Drive, Suite F
Soquel, California 95073

In Cooperation With:

Santa Cruz County Resource Conservation District

April 1999

EXHIBIT "A"

DAMAGE SURVEY REPORT
Branciforte Creek Homes Protection
DSR #01-99-0117
EMERGENCY WATERSHED PROTECTION

Table of Contents

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Exhibit No, 5

Form CA-PDM-4 (2/96)

USDA NATURAL RESOURCES CONSERVATION SERVICE
EMERGENCY WATERSHED PROTECTION
DAMAGE SURVEY REPORT

Eligible	Yes	_____
	No	_____
Approved	\$	_____

_____ DSR NO. 01 99 0117 _____

City of Santa Cruz, Dept. of Public Works / County of Santa Cruz, Dept. of Public Work
(Applicant)
809 Center Street, Room 201, Santa Cruz, CA 95060 / Santa Cruz County - 701 Ocean St.
(Address) (County) Santa Cruz, CA 95060

Channel Name: Branciforte Creek Reach: Beginning at the Isabel Dr. Bridge
and extending upstream 250 feet

Describe Damage: Severe streambank erosion caused by
February 7, 1999 storm event is endangering 3 homes, a public bridge and City owned
sewage lift station.

EVALUATION FACTORS:	YES	NO	REMARKS
Threat to Life and/or Property.	X		Non-Exigency
New Hazard Created by this Event		- % - - -	
Beneficiaries - Number 5	X		3 homes, bridge, sewage lift
Can Sponsor Obtain Cost Share, L.R., etc.	X		
Are other Local & State Funds Committed	X		Sponsor's cost share 25%
Cost of Emergency Work \$ 248,000.00			
Near Term Benefits \$ 3479,000.00			
EWP Treatment: Code 0 Quan 250 LF Code			Quan.
Code 056 Quan. 0.3 Ac Code			Quan.

Remarks: Proposed work includes 250 LF of Rock Rfprap bank protection and revegetation
The sponsor requests a local contract.

X_{sc} County Charles A. Jones Sponsor Representative (City) Richard J. Casale, D.C. NRCS Representative

REVIEW/APPROVAL:

SCE _____ AE _____

ADM _____ BRC _____

APPROVED: _____ DATE: _____

State Conservationist Representative

ATTACHMENTS: (attachments A, B, C D & E must be completed & submitted
with this DSR).

Location/Plan map A
Economic Defensibility B
Calculations/Coar. Data C
Environmental Evaluation D
Photographic Documentation E



PUBLIC WORKS DEPARTMENT
809 Center Street, Room 201, Santa Cruz California 95060
• (831) 420-5160 Fax (831) 420-5161

March 5, 1999

Mr. Jeffrey R. Vonk, State Conservationist
U.S. Department of Agriculture
Natural Resources Conservation Service
430 "G" Street, # 4164
Davis, California 95616-4164

Dear Mr. Vonk:

Re: Branciforte Creek, Santa Cruz County

We request Federal assistance under the provisions of Section 403, Agricultural Credit Act of 1978, to restore portions of the damaged channel and stream facilities of Branciforte Creek in the vicinity of Branciforte Drive and Isbel Street, Santa Cruz, California.

The subject area of concern is composed of public and private property, and includes lands situated in the jurisdictions of the City of Santa Cruz and Santa Cruz County. The City owns a sewer lift station on the north side of the Creek, adjacent to Isbel Street. Private property lines extend to the approximate center of the channel, the City nor the County own property other than the City's sewer lift station holdings.

These damages were initially caused by storms between February 18 and 19, 1998 and subsequently, by rains totaling 5.97" in a 24 hour period between February 6 and 7, 1999. I have attached related incident information outlining the City's efforts to clear the channel and banks of storm debris under the stipulations of a 1998 FEMA/OES DSR for emergency response work.

We expect increased erosion of the channel bank during the upcoming storm season. This work is needed to safeguard lives and property from an imminent hazard of flood flows.

We understand, as sponsors of an Emergency Watershed Protection project, that our responsibilities will include acquiring necessary right of way and permits to construct, and if required, to operate and maintain the proposed measures located within the City Limits. We are prepared to furnish the 25 percent local cost-share of the construction work, which includes engineering, survey and inspection of those portions of the project located within the City Limits.

If you need any additional information, please contact me by mail at the address listed below, or by calling my office at (831) 420-5169.

Sincerely,

Dan Whatley, Operations Manager
City of Santa Cruz Public Works Department
809 Center Street, Room 201
Santa Cruz, California 95060
FAX - (831) 420-5161
Pager - (408) 685-7838

cc: Carter Christenson, NRCS Salinas
Douglas Toews, NRCS Santa Maria

~~Richard Salas, NRCS Salinas 516 Soquel Driv., Santa Maria, CA 95071~~

Director of Public Works
Assistant Director of Public Works

attachments

File No: 420-20.33



County of Santa Cruz

DEPARTMENT OF PUBLIC WORKS

701 OCEAN STREET, ROOM 410, SANTA CRUZ, CA 950604070
(831) 454-2160 FAX (831) 454-2385 TDD (831) 454-2123

JOHN A. FANTHAM
DIRECTOR OF PUBLIC WORKS

April 9, 1999

JEFFREY VONK
STATE CONSERVATIONIST
NATURAL RESOURCES CONSERVATION SERVICE
430 "G" Street No. 4164
Davis, CA 95616-4164

SUBJECT: REQUEST FOR ASSISTANCE FOR BRANCIFORTE CREEK BANK REPAIR

Dear Mr. Vonk:

We request Federal assistance under provisions of Section 403, Agricultural Credit Act of 1978, to restore a streambank on Branciforte Creek severely eroded by the storm of 1998/99.

The damage involves failure and progressive erosion from toe to top of a bank of a 300-foot stretch of the streambank on an outside bend of Branciforte Creek just east (upstream) of the Isbel Drive bridge and west of Branciforte Drive. Two residential structures are in immediate danger of being undermined by the progression of the erosion of the east (outside) bank. Material which has sloughed off the east bank has altered the character of the channel in a manner which may adversely affect a third structure already partially in the flood plain on the west (inside) bank.

Also, potentially threatened are a City of Santa Cruz sewer pump station immediately downstream of the damage site on the opposite bank and the Isbel Drive Bridge. We understand that the City of Santa Cruz has made a separate request for assistance and may act as a cosponsor.

This work is needed to safeguard lives and property from an imminent hazard of floodwater and erosion.

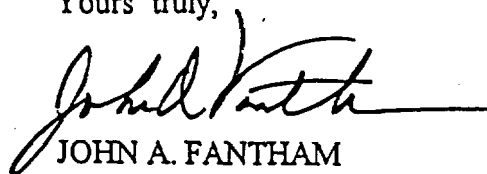
The County is interested in acting as a local sponsor so that the benefitting citizens can avail themselves of the Emergency Watershed Protection funds. However, since the proposed repairs in the unincorporated area involve private property, the County currently has no source of funds upon which it can legitimately draw to acquire land rights, permits, comply with additional permit requirements, operate and maintain the improvements, or provide the local cost share without reasonable expectation of complete reimbursement. Proposed County policy calls for the benefitting private property owners to provide for any costs beyond those covered by the Natural Resources Conservation Service (NRCS) or reimbursed by the Office of Emergency Services or other agencies.

The name and address of the contact person in our organization is follows:

Glenn Goepfert, Senior Civil Engineer
County of Santa Cruz
Department of Public Works
701 Ocean Street, Room 410
Santa Cruz, CA 95060

Please contact Glenn Goepfert at (831) 454-2160 if any additional information is needed.

Yours truly,



JOHN A. FANTHAM
Director of Public Works

GG:rw

Copy to: Douglas W. Toews, United States Department of Agriculture
Natural Resources Conservation Service
✓ Rich Casale, United States Department of Agriculture
Natural Resources Conservation Service
Carter Christenson, Toews, United States Department of Agriculture
Natural Resources Conservation Service

DSR NO. 01-99-0117

SPONSOR: CITY OF SANTA CRUZ / COUNTY OF SANTA CRUZ

RATIONALE OF SOCIAL/ECONOMIC DEFENSIBILITY
PRICE BASE 1999

Properties (OLIVER)	STRUCTURE Value(\$)	Depth Damage Factor*	Damage(\$)	Probability Factor**	Near Term Damage (\$)
161 Branciforte Dr. (Pecnie)	274,000	-	100,000	.5	50,000
190 ISABEL Dr. (Hudson)	274,000	-	274,000	1.0	274,000
224 ISABEL Dr. OLIVER	500,000.	.13	65,006.	1.0	65,000
Detached Garage / Apt	80,000.		80,000	.5	40,000
					.
				TOTAL	429,000

**** (Probability of Occurrence)**

ISABEL DRIVE Bridge	750,100	-	50,000	.5	25,000.
SEWAGE LIFT STATION	50,000	-	50,600	.5	25,000.
				TOTAL	50,000

				TOTAL	0

479,000

RATIONALE OF SOCIAL/ECONOMIC DEFENSIBILITY CONT'D.

4. Benefits to Environmental Resources:

(Address Quantities; net - & + effects; long term & short)

Refer to Environmental EVALUATION

5. a. Water Resources: .

Effects on Water Quality: *IMPROVED WATER QUALITY WITH PROJECT
REDUCED EROSION & SEDIMENTATION*b. Effects on Water Quantities: *NONE*
(water conservation benefits)c. Effects on Downstream Water Rights: *NONE*

6 Summary

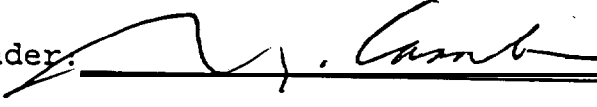
a. Present value of near term damages to be sustained: *\$479,000.*

b. Estimated cost of emergency work:

*\$ 248,000.00**B/C Ratio = 1.9*

7. Recommendations:

a. Emergency work is economically justified and approval is recommended.

Team Leader: Date: *3/31/99*c. Emergency work cannot be economically justified with data available to **team**. Emergency work has the following unevaluated benefits not included in the damage analysis.

Beneficial Effects:

Adverse Effects:

Based on unevaluated benefits, I recommend the project be (approved/disapproved).

Team Leader

Date

USDA-NRCS
EMERGENCY **WATERSHED** PROTECTION

Summary of Measures Installed and Cost

February 7, 1999 March 29, 1999 CA
 Event Date & Name Project Code Date of Report State

Projects installed under (NRCS) (FS) supervision
circle one

<u>Measure Category</u>	<u>Measure Installed</u>	<u>Units</u>	<u>Units Installed</u>	<u>Construction Costs</u>
010				
Area devoid of vegetation (gully(ies), small land- slides, burns, etc.)	011 Contour furrowing	Acre	_____	_____
	012 Contour tree felling	Acre	_____	_____
	013 Diversion	Feet	_____	_____
	014 Fencing	Feet	_____	_____
	Grade stab. Structure:			
	015 New	Number	_____	_____
	016 Repair	Number	_____	_____
	Revegetation			
	017 Aerial seeding and/or fert.	Acre	_____	_____
	018 Drill seeding and/or fert.	Acre	_____	_____
019 Hand planting	Acre	_____	_____	
Subtotal - Construction Cost \$				<u>-0-</u>
020				
Critical Road	021 Diversion	Feet	_____	_____
	Grade stab. structure:			
	022 New	Number	_____	_____
	023 Repair	Number	_____	_____
	024 Reshaping	Feet	_____	_____
	025 Revegetate	Acre	_____	_____
	026 Waterbar	Feet	_____	_____
Subtotal - Construction Cost \$				<u>-0-</u>
030				
Dam or Reservoir (FRS or MPS)	031 Construct (new)	Number	_____	_____
	032 Repair	Number	_____	_____
Subtotal - Construction Cost \$				<u>-0-</u>

Summary of Measures Installed and Cost Cont'd.

<u>Measure Category</u>	<u>Measure Installed</u>	<u>units</u> <u>Installed</u>	<u>construction</u> <u>Costs</u>
<u>040</u>			
Debris or	<u>Basin or Dam</u>		
Sed. Control	041 Construct (new)	Number _____	_____
	042 Cleanout	Number _____	_____
	042 Repair	Number _____	_____
	044 Log Boom	Number _____	_____
	045 Sediment Trap	Number _____	_____
	046 Trash Rack	Number _____	_____
			-0-
	Subtotal - Construction Cost		_____
<u>050</u>			
Levee, Dike,	051 Construct (new)	Feet _____	_____
Dune	052 Repair	Feet _____	_____
	053 Re-vegetate	Acre _____	_____
			-0-
	Subtotal - Construction cost		\$ _____
<u>060</u>			
Stream or	061 Bank Stabilization	Feet 250	432,500.00
Surface Drain	062 Debris or sediment removal	Feet _____	_____
	<u>Grade Stab. Structure:</u>		
	063 New	Number _____	_____
	064 Repair	Number _____	_____
	065 Reshape	Acre _____	_____
	066 Re-vegetate	Acre 0.3	15,000.00
	Subtotal - Construction cost		\$247,500.00
	TOTAL CONSTRUCTION COST		\$ 247,500.00
			USE \$248,000.00
	Rixon J. Rafter		
	Compiled by		

U S DEPARTMENT OF AGRICULTURE

ENVIRONMENTAL EVALUATION 1/

NATURAL RESOURCES CONSERVATION SERVICE

AND USER/PROJECT Branciforte Homes Protection EWP DATE 3-31-99 =SPONSOR City of Santa CruzFIELD OFFICE ISOQUELEN T Y SANTA CRUZ

ENVIRONMENTAL FACTORS	EFFECT 2/			NOTES 3/
	Without Project	Short Term	Long Term	
PRIME/UNIQUE FARMLAND	N/A	N/A	N/A	
CHANGE IN LAND USE (What is change?)	N/A	N/A	N/A	
SOIL EROSION (Quantify if possible)	-	+	+	Streambank erosion
SEDIMENTATION (Quantify if possible)	-	+	+	reduced sedimentation into Branciforte Creek.
SOIL CONDITION (Compaction, salinity, fertility, etc.)	0	0	0	
SURFACE WATER QUANTITY	0	0	0	
SURFACE WATER QUALITY	-	+	+	reduced sediment into Creek & surrounding water
SUBSURFACE WATER QUANTITY	0	6	0	
SUBSURFACE WATER QUALITY	0	0	0	
AIR QUALITY	0	-	0	equipment emissions during construction
VEGETATION ALTERATION (What is change?)	-	-	+	some veg. removed during construction. All disturbance will be revegetated.
*FLOODPLAIN	0	0	0	
*WETLANDS (Includes riparian)	-	+	+	reduced sedimentation and erosion
FISH AND WILDLIFE HABITAT		+	+	reduced sedimentation and erosion
*THREATENED OR ENDANGERED SPECIES - Plants or animals	-	+	+	Steel head stream
*CULTURAL RESOURCES	0	0	0	NONE MAPPED, KNOWN OR OBSERVED
AESTHETICS (Appearance of landscape)	-	+	+	native revegetation
ECONOMICS	-	+	+	project will benefit 3 homes
OTHER				

1/ Use for individual practices. RMS, conservation or treatment unit, or EWP, RC&D, small watershed projects (Refer to GM190-410).

2/ CODE ITEMS: (+) Beneficial Effect. (0) No Effect. (-) Adverse Effect. (N/A) Not Applicable. Without Project = What are effects if no project action? Short Term = Installation period. Long Term = Period through duration of intended use. Life of project or restore to pre-condition. Assess off-site or cumulative impacts, as well as on-site.

3/ Explain all + or - effects and note if on-site and/or off-site.

(*) CRITICAL ENVIRONMENTAL FACTOR addressed in Federal Regulations.

- CONTINUED ON BACK -

ALTERNATIVES TO PROPOSED ACTIONS (include reasons why alternative was not selected):

1. ⁹⁰ Nothing. Erosion will continue and lives & property will be threatened
 2. ~~RESHAPE~~ ~~ERODED~~ BANKS AND REVEGETATE with Deep rooted native riparian trees and other vegetation. This will not provide adequate protection for next year storms. It will take several years before trees are well established.
 3. Place large rock riprap on reshaped banks and revegetate. Selected alternative
 4. Install a combination of rock filled gabion baskets, rock riprap and revegetate.
- Sponsor (Landuser) will be informed of their responsibility in obtaining necessary permits.

RECOMMENDATION (check one) :

☒ Evaluation indicates work should proceed. Includes situations where long term beneficial effects outweigh short term adverse effects.

☐ Continue evaluation for further information. Landuser will be informed not to proceed with work until evaluation is completed.

☐ Evaluation indicates significant adverse environmental effects will result. Explore other alternatives.

REMARKS:

PREPARED BY:

 3/31/99

UTILITY CHECK SHEET

Project or
Farm Name Branciforte Creek Homes Protection Location Santa Cruz, California

DSR No. 01-99-0117

Utilities Involved and Location: telephone, electrical and sewer
line plus a sewer pumping station.

Landowner or operator notified Who Team By Whom

How Date:

Work to be done: Streambank Protection When:

Utility Company Notified: Who by Whom

How Date:

Request to locate utility

Work to be done: When:

Request for Company representative to be present

Utility marked or staked Date:

Representative present during construction

Contractor Notified: Who By Whom How Date

Type of utility: Location:

Vertical location in relation to work

Horizontal location in relation to work

Contractor shown markings or stakes

Utility location shown on plans

Other remarks

Engineer's Cost Estimate
CA-ENG-200 (10/95)

U. S. Department of Agriculture
Natural Resources Conservation Service
D.S.R. # 01-99-0117

Engineer's Cost Estimate

Project Branciforte Creek Homes Protection

Date: 7-Apr-99

By: R. Rafter

Checked: 

Item N	Work or Material	Spec. N	Quant. Est.	Unit	Unit Price	Amount
1	Mobilization		Job	L.S.	\$15,000.00	\$15,000.00
2	Clearing & Grubbing		Job	L.S.	\$20,000.00	\$20,000.00
3	Control of Water		Job	L.S.	\$20,000.00	\$20,000.00
4	Excavation		1,800	C.Y.	\$20.00	\$36,000.00
5	Compacted Fill		1500	C.Y.	\$30.00	\$45,000.00
6	Rock Riprap		900	C.Y.	\$100.00	\$90,000.00
7	Geotextile Fabric		1300	S.Y.	\$5.00	\$6,500.00
8	Revegetation		Job	L.S.	\$15,000.00	\$15,000.00
9	TOTAL					\$247,500.00
10						
11					USE	\$248,000.000
12						
13						
14						
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Branciforte Creek Haines Protection

Date: April 7, 1999

Branciforte Drive
Santa Cruz California

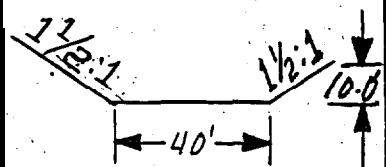
D.S.R# 01-99-0117

BY: R. Rafter

Sheet: 1 of 3

Damage Survey Report

NOTE: USE 40' Ave bottom Width
for Section above bridge
Use 12.0 depth



Ref: Kings Hdbk Hydraulics
6th Ed. Table 7-11

Formula = $Q = \frac{K' b^{3/2} S^{1/2}}{n}$

$$Q = \frac{K' b^{3/2} S^{1/2}}{n}$$

γ_s = specific gravity
of stone

References for Riprap:

1. NEFM pg. 16A-1 Isbasb Lower
AT. V-13.2 Eqs. Drow 25 in.
@ $\gamma_s = 1.65 \text{ tps/ft}^3$

2. Design Chart 712-1
Rev 8-58, 9-78 Wes 6-59
by US Army Corps Eng'rs.
Waterways Exp. Sta.

NOTE: The D_{100} dimensions
from both sources are
close. 25 in. (Isbasb)
Versus 26.4 in. (C/E
Chart 712-1)

BANK PROTECTION

A. Channel-Branciforte Creek @ ISBEL DRIVE bridge

1. Gradient - 1% (U.S.G.S. Santa Cruz Quad. Map)
2. Depth at Isabel Drive Bridge = 14.0 ft.
3. Width at " " " " = 36.0 ft.
4. Bank slopes 1:1-2:1 use 1 1/2:1
5. n-factor = 0.043
6. D/b ratio = 0.25
7. Cross-section Area = 550.0 ft^2
8. Hydraulic radius (r) = 7.23
9. $K' = 0.163$

B. Compute Channel Capacity and Velocity

1. Channel Capacity

$$Q = \frac{K' b^{3/2} S^{1/2}}{n} = \frac{0.163 (40)^{3/2} (0.01)^{1/2}}{0.043}$$

$$= \frac{(0.163) (18945.2) (0.1)}{0.043} = 7,181.6 \text{ cfs.}$$

2. Channel Velocity =

$$V = Q/A = \frac{7,181.6 \text{ cfs}}{550 \text{ ft}^2} = 13.06 \text{ f.p.s.} = 13.1 \text{ f.p.s.}$$

C. Compute Loose Rock Riprap gradation
from Stone Stability Chart $D_{50} = 13.2 \text{ in.}$

Rock Gradation

$$\begin{aligned} D_{100} &= 2 \cdot D_{50} = (13.2 \text{ in}) 2 = 26.4 \text{ in.} = \text{USE } 30 \text{ in.} \\ D_{75} &= 1.5 D_{50} = 19.8 \text{ in.} = \text{USE } 20 \text{ in.} \\ D_{50} &= 1.0 D_{50} = 13.2 \text{ in.} = \text{USE } 14 \text{ in.} \\ D_{37} &= 0.73 D_{50} = 9.6 \text{ in.} = \text{USE } 10 \text{ in.} \\ D_{10} &= 0.3 D_{50} = 3.96 \text{ in.} = \text{USE } 4 \text{ in.} \end{aligned}$$

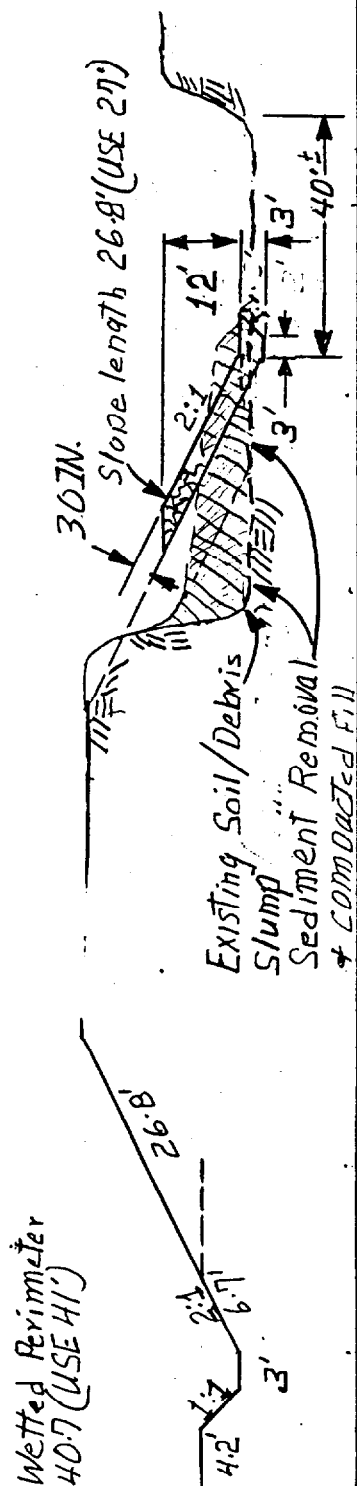


Branciforte Creek Homes Protection
 Date 4/07/1999
 By: R-Rafter

Branciforte Drive/Isabel Drive
 Santa Cruz California

D.S.R# 01-99-0117
 Sheet #2 of 3

22-141 50 SHEETS
 22-142 100 SHEETS
 22-144 200 SHEETS



II Quantity & Cost Estimate

A. Mobilization

1. Job Lump Sum

\$ 15,000

B. Clearing & Grubbing

1. Job Lump Sum

\$ 20,000

C. Control of Water

1. Job Lump Sum

\$ 20,000

D. Excavation

1. Sta 0+85 - 1+70

$$\frac{3.16 \text{ in} \times 100 \text{ ft}^2/\text{in}^2 \times 85 \text{ ft}}{27 \text{ ft}^3/\text{yd}^3} = 995 \text{ yd}^3$$

2. Sta 0+00 - 0+85

$$\frac{25' \times 15' \times 85 \text{ ft}}{27 \text{ ft}^3/\text{yd}^3} = 597 \text{ yd}^3$$

3. Toe Trench

$$\frac{12' \times 3' \times 3' \times 250 \text{ LFT}}{27 \text{ ft}^3/\text{yd}^3} = 208 \text{ yd}^3$$

$$\text{USE } 1,800 \text{ yds} \\ 1,800 \text{ yd}^3 \times 20/\text{yd}^3 = \$36,000$$

E. Compacted Fill

1. Sta 0+00 - 0+85

$$\frac{10' \times 15' \times 85 \text{ ft}}{27 \text{ ft}^3/\text{yd}^3} = 472 \text{ yd}^3$$

2. Sta 0+85 - 1+70

$$\frac{8.5' \times 2.28 \text{ m}^2 \times 100 \text{ ft}^2/\text{m}^2}{27 \text{ ft}^3/\text{yd}^3} = 718 \text{ yd}^3$$

3. Sta 1+70 - 2+50

$$\frac{(10.45' \times 10') \times 80 \text{ ft}}{27 \text{ ft}^3/\text{yd}^3} = 308 \text{ yd}^3$$

$$\text{USE } 310 \text{ yd}^3 \\ 1500 \text{ yd}^3 \times 30/\text{yd}^3 = 45,000$$



Branciforte Creek Homes Protection

Date: 4/07/1999

By: R. Rafter

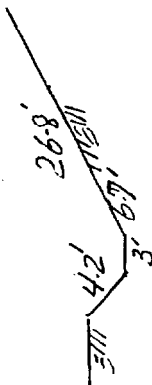
Branciforte Drive Isabel Drive

Santa Cruz, California

D.S.R #01-99-0117

Sheet 3 of 3

NOTE: Add 60 yds for
spurs @ 10' depth
rip rap.



F. Loose Rock Riprap Sta. 0+00 - 2+50

$$\left[\frac{27 \times 2.5' + \left(\frac{12+3}{2} \times 3' \right)}{27 \text{ ft}^3 / \text{yd}^3} \right] \times 250 \text{ ft.}$$

$$\frac{67.5 \text{ ft}^2 + 22.5 \text{ ft}^2}{27 \text{ ft}^3 / \text{yd}^3} \times 250 \text{ ft.}$$

$$3.33 \text{ yd}^3 / \text{ft} \times 250 \text{ ft.} = 833.33 \text{ yd}^3$$

$$100 / \text{yd}^3 \times \text{USE } 900 \text{ yd}^3 = 90,000$$

G. Geotextile Fabric

$$(4.2' + 3' + 6.7' + 26.8') = 40.7 \text{ ft.}$$

$$+ 10\% \quad \text{USE } 45 \text{ L.FT.}$$

$$\frac{45 \text{ L.FT.} \times 250 \text{ L.FT.}}{9 \text{ ft}^2 / \text{sq yd.}} = 1250 \text{ sq yd.}$$

$$1250 \text{ sq yd.} \times \$5 / \text{sq yd.} = \$6,250$$

USE 6,500

H. Revegetation

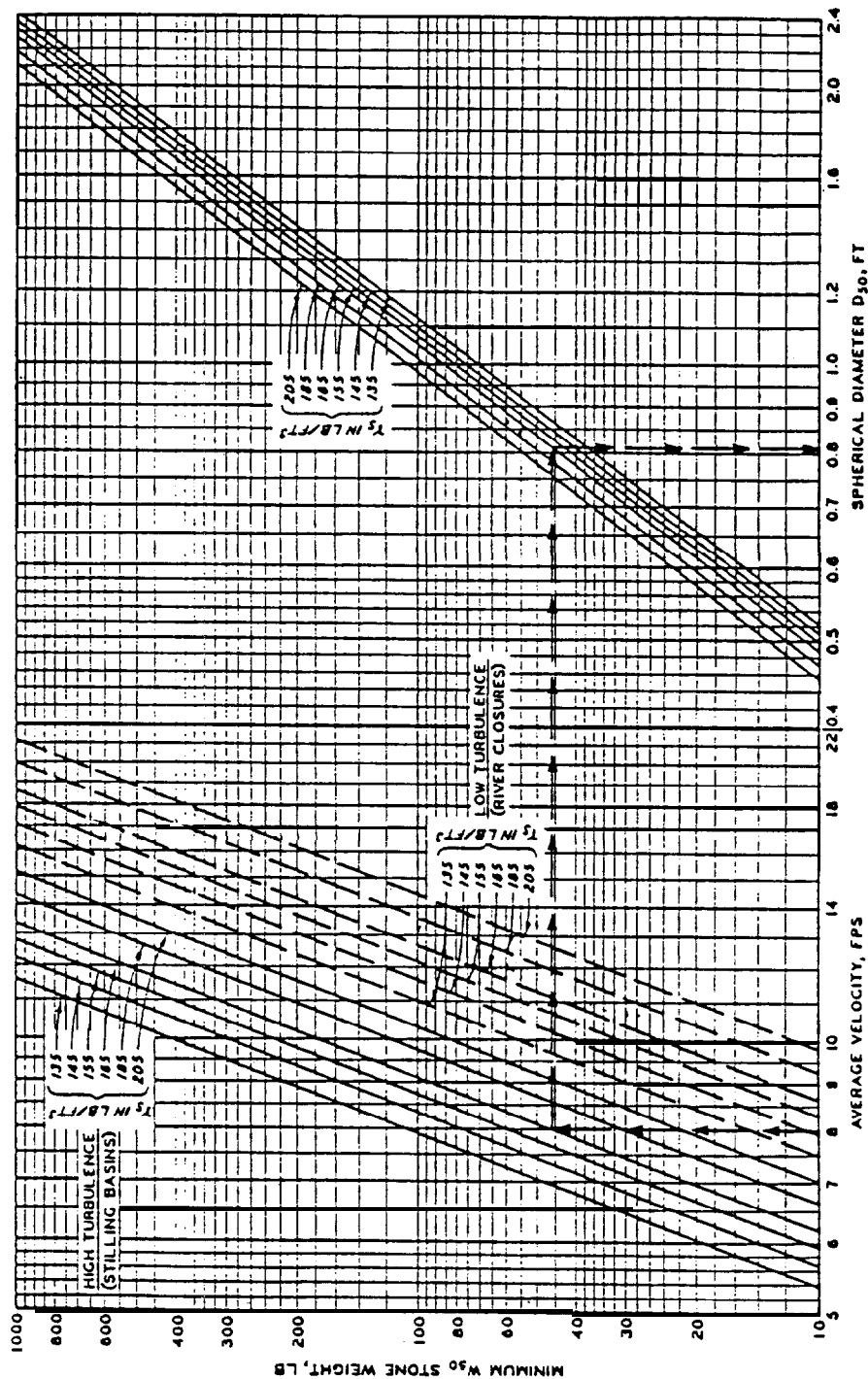
Job - Lump sum.

15,000

Total

\$ 247,500

USE 248,000



PREPARED BY U. S. ARMY ENGINEER WATERWAYS EXPERIMENT STATION, WICKLIFFE, OHIO

BASIC EQUATIONS

$$V = C \left[2g \left(\frac{\gamma_s - \gamma_w}{\gamma_w} \right) \right]^{1/2} (D_{50})^{1/2}$$

$$D_{50} = \left(\frac{C W_{50}}{\gamma_s - \gamma_w} \right)^{1/3}$$

WHERE: V = VELOCITY, FPS

γ_s = SPECIFIC STONE WEIGHT, LB/FT³

γ_w = SPECIFIC WEIGHT OF WATER, 62.5 LB/FT³

W_{50} = WEIGHT OF STONE. SUBSCRIPT DENOTES PERCENT OF TOTAL WEIGHT OF MATERIAL CONTAINING STONE OF LESS WEIGHT.

D_{50} = SPHERICAL DIAMETER OF STONE HAVING THE SAME WEIGHT AS W_{50}

C = ISBACH CONSTANT (0.86 FOR HIGH TURBULENCE LEVEL FLOW AND 1.20 FOR LOW TURBULENCE LEVEL FLOW)

g = ACCELERATION OF GRAVITY, FT/SEC²

STONE STABILITY VELOCITY VS STONE DIAMETER

HYDRAULIC DESIGN CHART 712-1
(SHEET 1 OF 2)

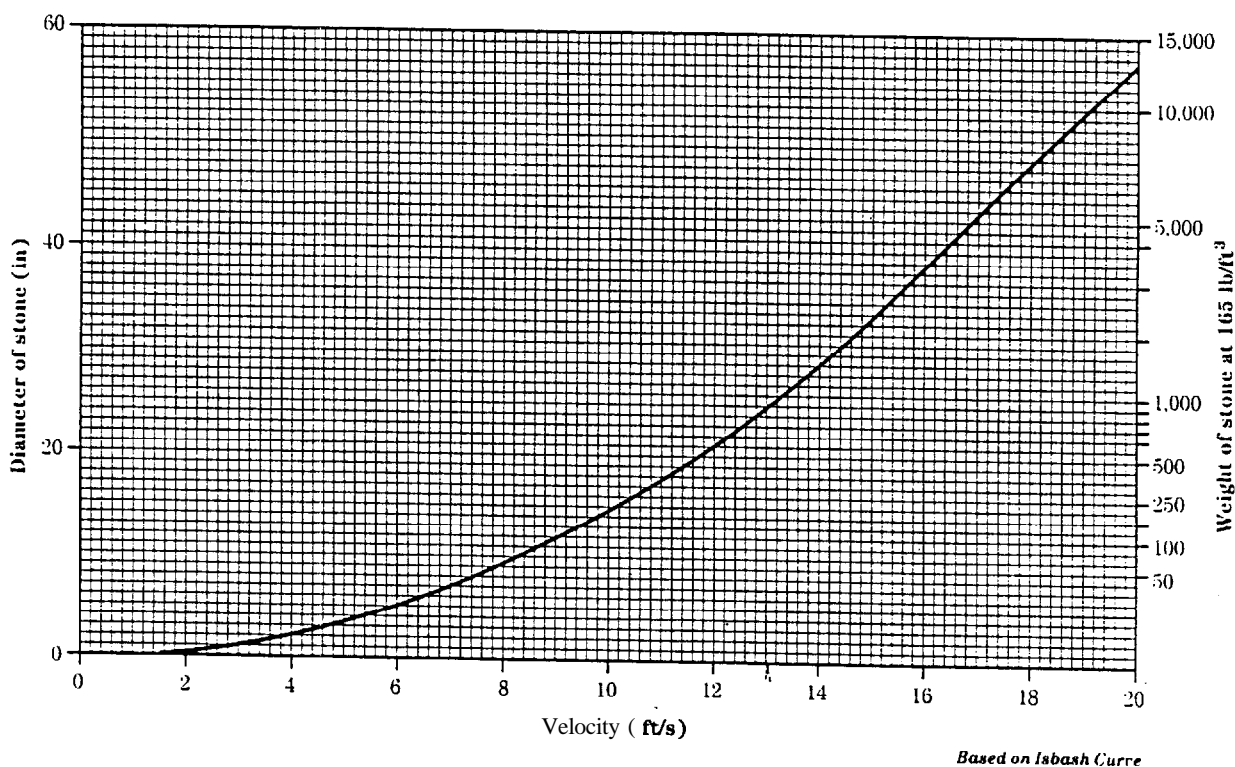
REV 8-58, 8-70

WES 8-17

Isbash Curve

The Isbash Curve, because of its widespread acceptance and ease of use, is a direct reprint from the previous chapter 16, Engineering Field Manual. The curve was developed from empirical data to determine a rock size for a given velocity. See figure 16A-1. The user can read the D_{100} rock size (100 percent of riprap \leq this size) directly from the graph in terms of weight (pounds) or dimension (inches). Less experienced users should use this method for quick estimates or comparison with other methods before determining a final design.

Figure 16A-1 Rock size based on Isbash Curve



Procedure

1. Determine the design velocity.
2. Use velocity and fig. 16A-1 (Isbash Curve) to determine basic rock size.
3. Basic rock size is the D_{100} size.

Figure 16A-2 Rock size based on Far West States (FWS) Lane method

D_s (nominal diameter in inches). Size of rock for which 25% by weight is larger

$$D_s = \frac{3.5}{C} W S$$

$D_s = D_{75}$ size rock in inches

Notes:

1. Ratio of channel bottom width to depth (D) greater than 4.
2. Specific gravity of rock not less than 2.56.
3. Additional requirements for stable riprap include fairly well graded rock, stable foundation, and minimum section thickness (normal to slope) not less than D_s at maximum water surface elevation and 3 D_s at the base.
4. Where a filter blanket is used, design filter material grading in accordance with criteria in NRCS Soil Mechanics Note 1.

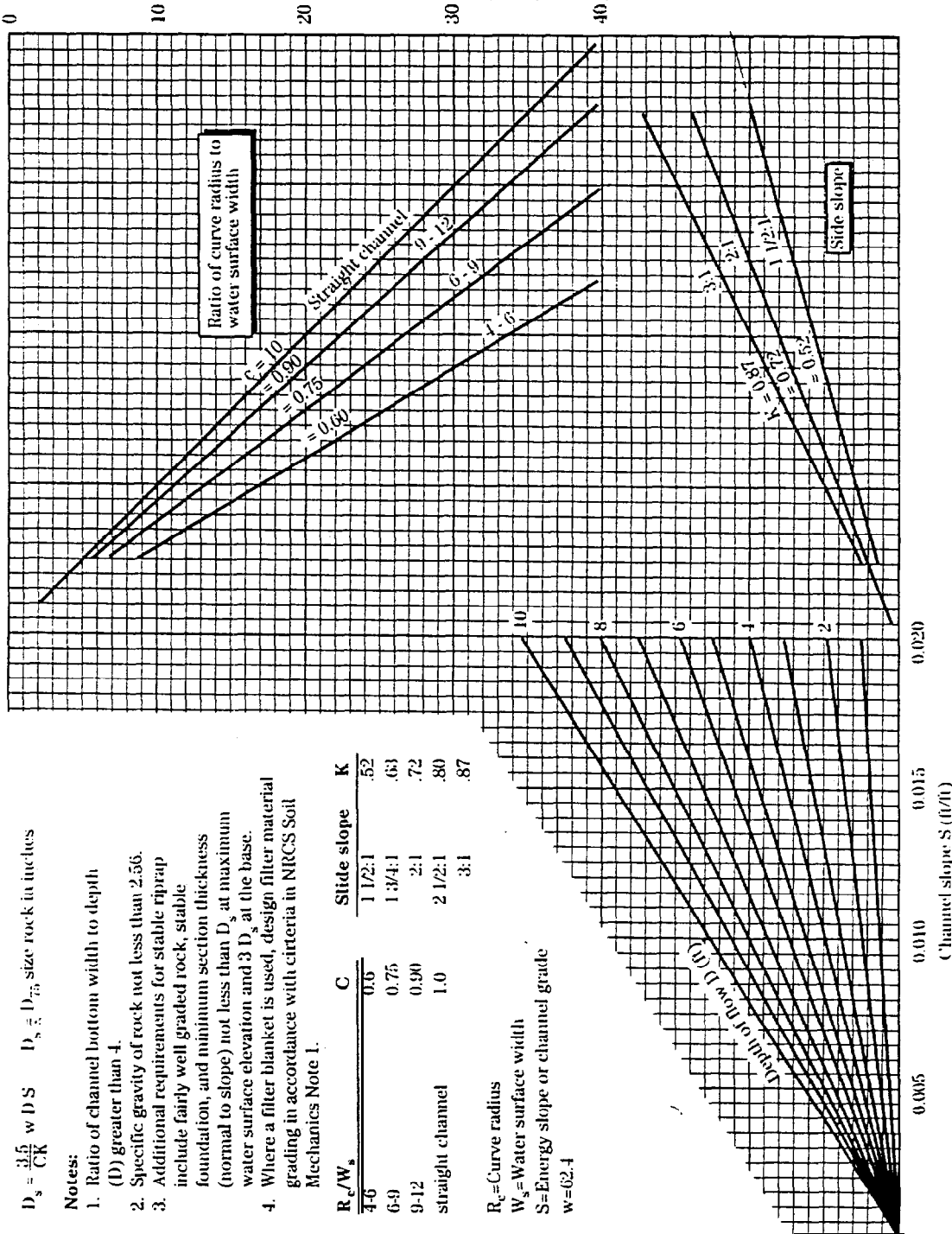
R_c/W_s	C	Slide slope	K
4-6	0.5	1 1/2:1	.52
6-9	0.75	1 3/4:1	.63
9-12	0.90	2:1	.72
straight channel	1.0	2 1/2:1	.80
		3:1	.87

R_c = Curve radius

W_s = Water surface width

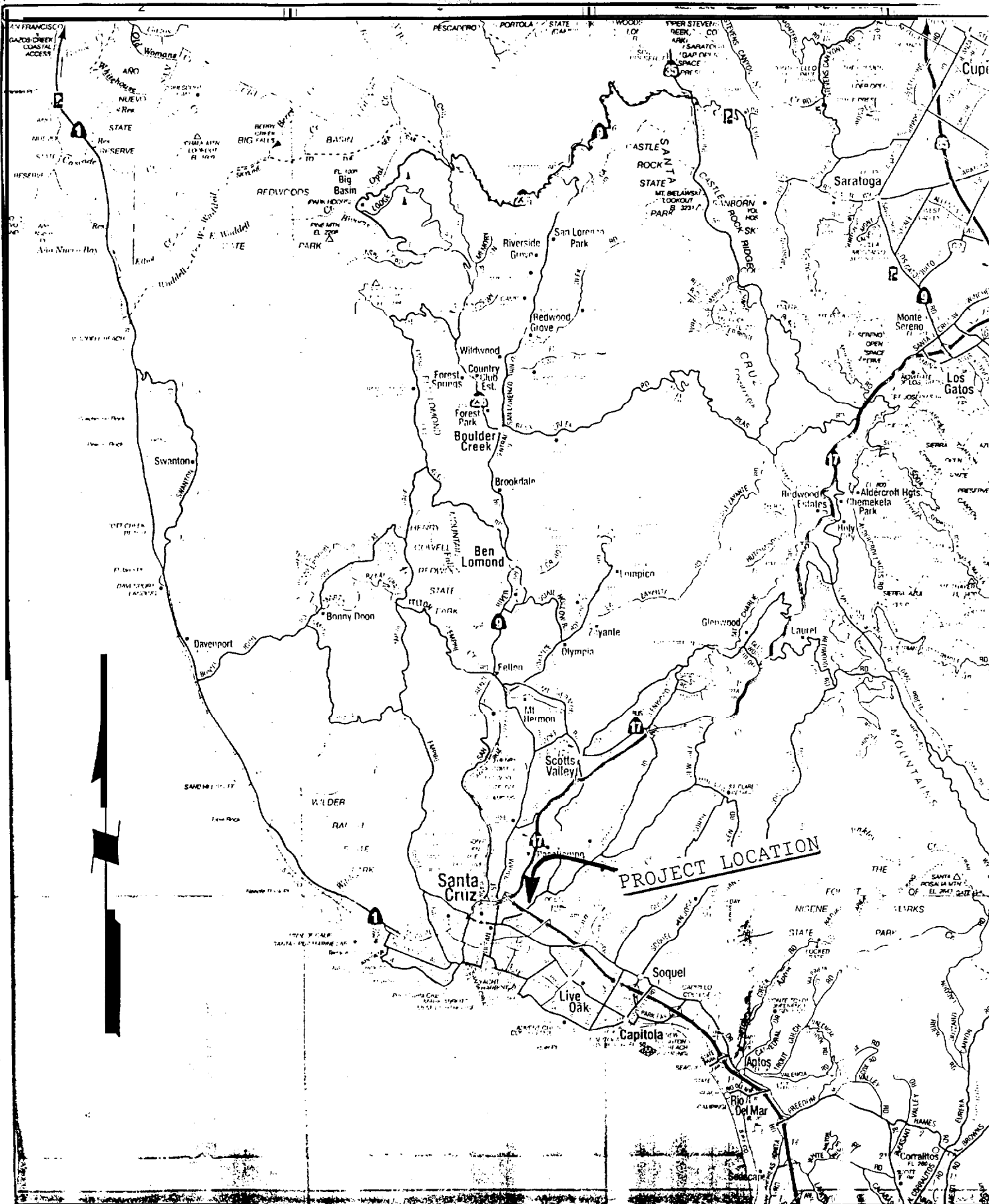
S = Energy slope or channel grade

$w = 62.4$



Procedure

1. Determine the average channel grade or energy slope.
2. Enter fig. 16A-2 with energy slope, flow depth, and site physical characteristics to determine basic rock size.
3. Basic rock size is the D_{75} size.



BRANCIFORTE CREEK HOMES PROTECTION
Santa Cruz, California

D.S.R. #01-99-0117

VICINITY MAP

U. S. DEPARTMENT OF AGRICULTURE ★ SOIL CONSERVATION SERVICE

Designed -

DATE

Approved by:

PAGE
20

Title:

Checked

DATE

Job
Class: III

DRAWING NUMBER

95060



9

Santa Cruz City Limits

De Laveaga Park
Covered Bridge

PROJECT LOCATION

Santa Cruz County
Gen Hosp

Boy Scouts Cabin

Nat'l Guard Armory

PROSPECT

200 JUAN AVE

ALLERTON

SAN

MORRISSEY

MARNELL

TRAVEL

ROXAS

AVE

300

FAIRMOUNT

100

CHILVER

RT

ST

FAIRMOUNT

100

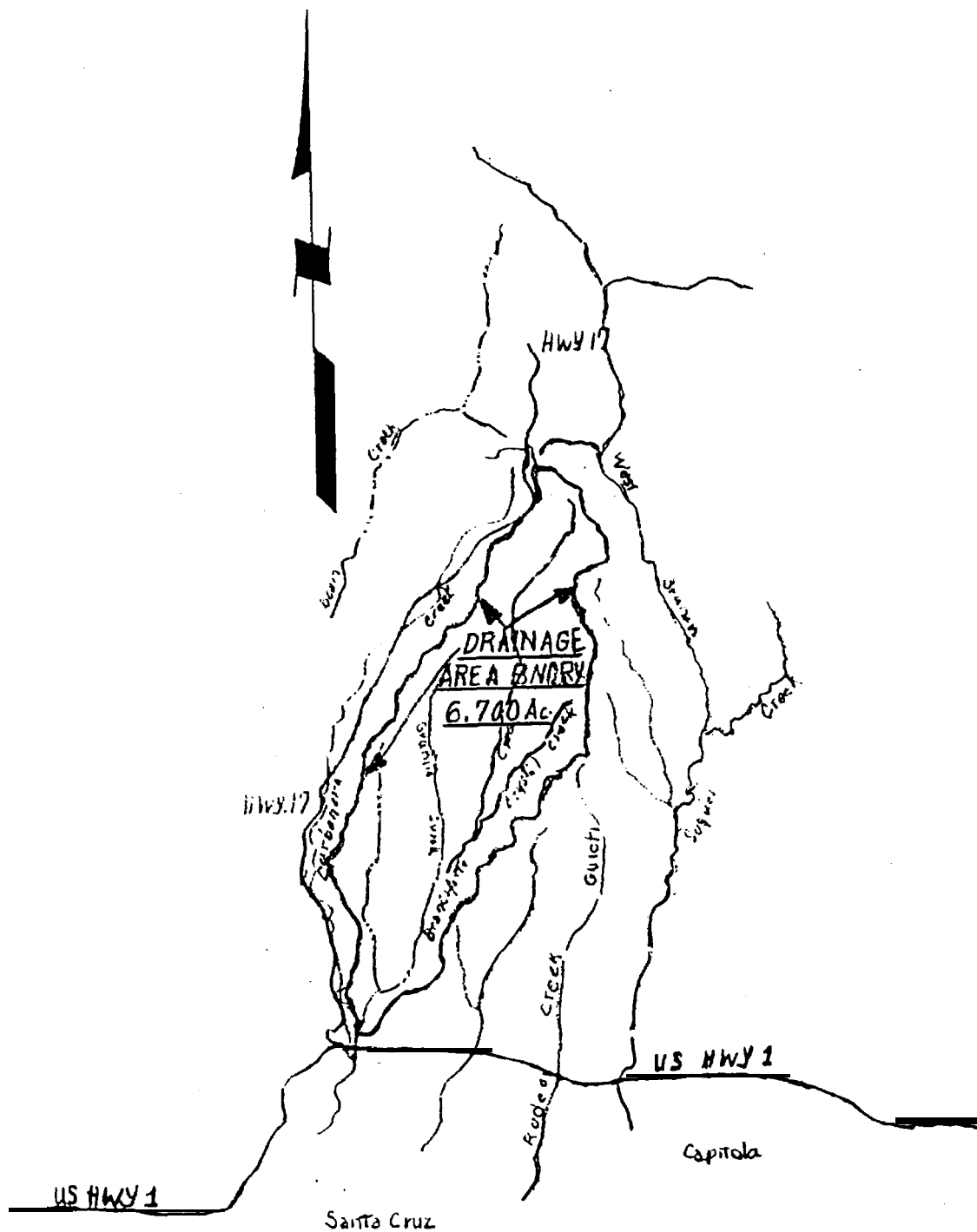
BRANCIFORTE CREEK HOMES PROTECTION
Santa Cruz, California

D.S.R. #01-99-0117

LOCATION MAP

U. S. DEPARTMENT OF AGRICULTURE ★ SOIL CONSERVATION SERVICE

Designed _____	DATE _____	Approved by: <u>21</u>	Title: _____
Checked _____	DATE _____	Job Class: III	DRAWING NUMBER _____



DRAINAGE AREA= 6,700 Ac.±, (10.5 Sq. Miles)
 SCALE: 1 IN.=2.0 MILES

BRANCIFORTE CREEK HOMES PROTECTION
 Santa Cruz, California

D.S.R. #01-99-0117

DRAINAGE AREA MAP

U. S. DEPARTMENT OF AGRICULTURE ★ SOIL CONSERVATION SERVICE

Designed - _____	DATE _____	Approved by: <u>22</u>	Title: _____
Checked - _____	DATE _____		

Drawn Plan

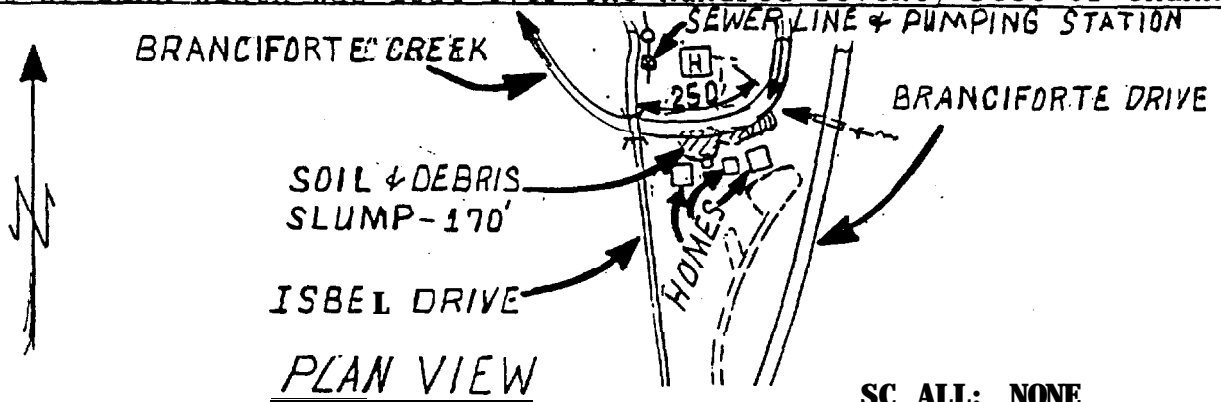
DSR 01-99-0117

Channel Name: Branciforte Creek

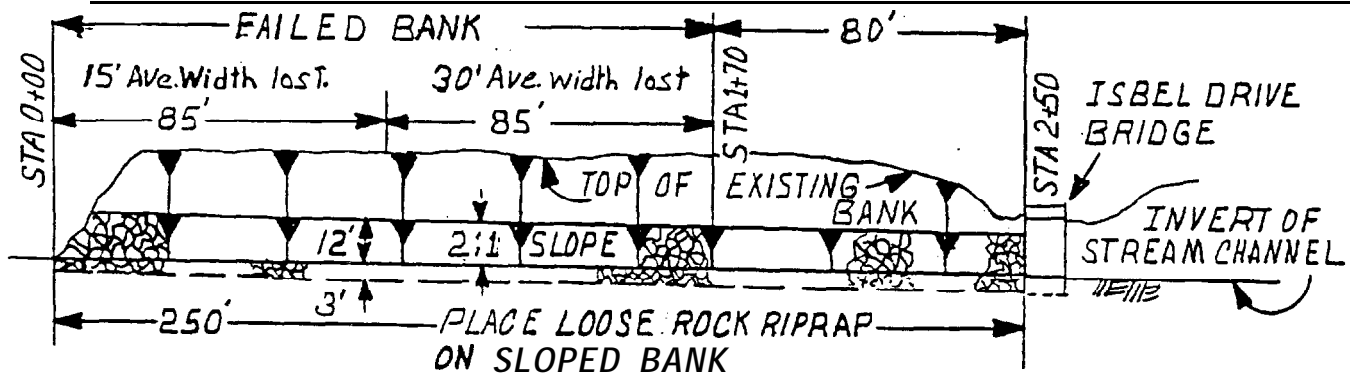
S i t e

Channel Reach: Beginning at the Isabel Drive Bridge and extending upstream approximately 250 feet.

Description of Damage: Heavy, sustained period of rainfall saturated the streambank which then collapsed or slumped. Fifteen to forty feet of bank width was lost over one hundred seventy feet of channel.

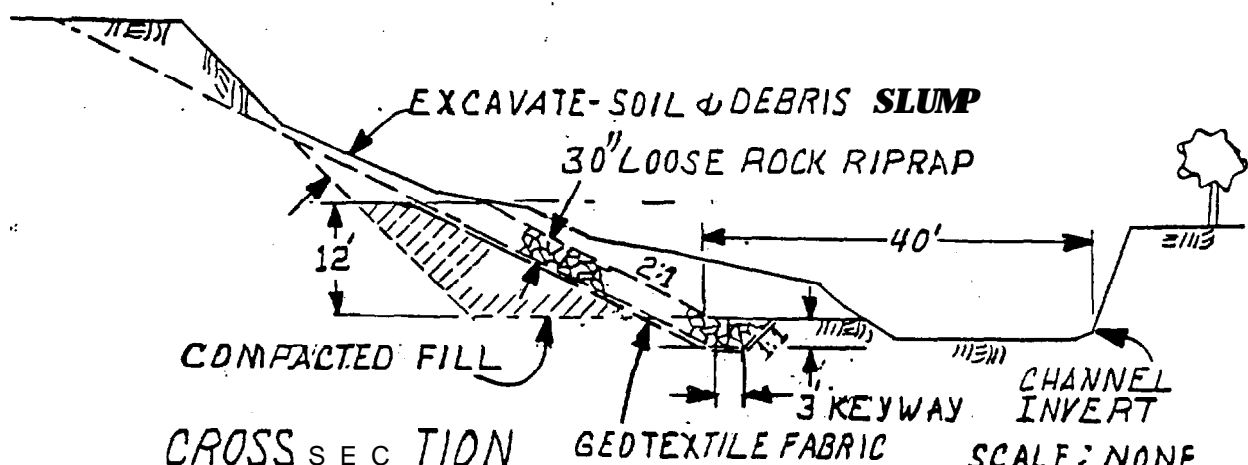


SC ALL: NONE



SCALE: NONE

PROFILE



CROSS SECTION

Cost Estimate \$248,000.00 Near Term Damage Estimate \$479,000.00

BRANCIFORTE CREEK HOMES PROTECTION
D.S.R. #01-99-0117



COMPOSITE PHOTOGRAPH: SHOWS A PORTION OF THE
FAILED BANK (170 FEET) ON BRANCIFORTE CREEK. THE
DAMAGE EXTENDS DOWNSTREAM 80 FEET TO THE BRIDGE
ON ISBEL DRIVE. TOTAL LENGTH OF THE FAILED SECTION
IS 250 FEET.