B

Type

Plans

GRD17-0074

Permit Number

17250

Street Number

Hwy 1

Street Name

FTR

Community Code

109-120-009

APN

PRMD County of Sonoma

COUNTY OF SONOMA - PERMIT AND RESOURCE MANAGEMENT DEPARTMENT

2550 Ventura Avenue, Santa Rosa, CA 95403 (707) 565-1900 FAX (707) 565-1103

Please Print Your Name: TOM ATTERBURY
Date Applied: 4-26-17

INFORMATION WITHIN HEAVY LINE TO BE COMPLETED BY APPLICANT

SITE LOCATION INFORMATION - PRINT CLEARLY

Site Address: 17500 HWY. 1 City: JENNER ZIP: 95450
Cross-Street: MEYERS GRADE RD. APN: 109-120-009 Project Phone #: (707 513-7651 Project Fax #: ( )
Directions: NORTH ON HWY 1 TO MILE POST 30.5 Email address: ROBERT.GARBOCCI@GCINC.COM Unit # Lot #
Describe Project: FILL PLACEMENT OF PROJECT PLP15-0079 12,600 CY FILL / STABILIZE LAND SLIDE (FILL FROM PROJECT)
Living Area
Garage
Contract Price:

OWNER NAME AND ADDRESS	APPLICANT NAME AND ADDRESS
Name: SOPER COMPANY	Name: ATTERBURY & ASSOCIATES, INC.
Mailing Address: 19855 BARTON HILL RD.	Mailing Address: 16109 HEALDSBURG AVE
City: STRAWBERRY VALLEY State: CA ZIP: 95981	City: HEALDSBURG State: CA ZIP: 95448
Day Ph: 530 675-2343 Fax: ( )	Day Ph: 707 433-0134 Fax: (707-433-0135

CONTRACTOR INFORMATION	OTHER PERSONS (ARCHITECT, ENGINEER, ETC.)
Company Name: GRANITE CONSTRUCTION CO.	Name:
Address: 1324 S. STATE STREET	Address:
City: UKIAH State: CA ZIP: 95482	City: State: ZIP:
Day Ph: 707 467-4100 Fax: 707 467 4143	Day Ph: ( ) Fax: ( )
	License No: Exp. Date:

WORKER'S COMPENSATION DECLARATION

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

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

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

Carrier Valley Ford Insurance Co.
Policy No. WC 2749786 30.

(This section need not be completed if the permit is for one hundred dollars ($100) or less).

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

Exp. Date: 10/1/17 Applicant:

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

CONSTRUCTION LENDING DECLARATION

I hereby affirm under penalty of perjury that there is a construction lending agency for the performance of the work for which this permit is issued. (Sec. 3097, Civ. C.).

Lenders Name
Lenders Address

FOR DEPARTMENT USE

Zoning File No. PLP15-0079 Acres ???
Existing Use/Structures
Proposed Use/Structures grading for Landslide Repair
Zoning Min. Yard Requirements: Front Left Right Back
NOTE: Fire Safe Standards require all parcels greater than 1 Acre to have a min. 30' setback unless mitigated. ☐ Mitigation Required ☐ Address subject to change
Approval for Permit Issuance: Approval for Occupancy:
By: By: J. Fago
Date: Date: 6/26/17
Conditions:
TP B6 160 TPCC B6 160/640 G RC 100/50 SR

Sewer Connection: ☐ Available ☐ Fees Paid
Approved by: Date:

Road Encroachment: ☐ Fees Paid
Approved by: Date:

Septic System Permit/Clearance: Not Applicable
Approved by: [signature] Date: 4/26/17

Flood Zone: ☐ Yes ☒ No 100 Year Flood Elevation:

Site Review
Drainage Review:
Approved by: [signature] for YT Date: 6/26/2017

Fire:
Approved by: [signature] for RODELL Date: 5/15/2017

Code Enforcement Violation ☐ Yes ☒ No Violation #
This permit is limited to ______ days.

Work Authorized: Fill placement associated w/ PLP15-0079

OWNER-BUILDER DECLARATION

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

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

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

☐ I am exempt under Sec.________, B & P.C. for this reason

By my signature below I acknowledge that, except for my personal residence in which I must have resided for at least one year prior to completion of the improvements covered by this permit, I cannot legally sell a structure that I have built as an owner-builder if it has not been constructed in its entirety by licensed contractors. I understand that a copy of the applicable law, Section 7044 of the Business and Professions Code, is available upon request when this application is submitted or at the following website: http://www.leginfo.ca.gov/calaw.html.

CE 37857 [signature] PE
Date Signature of Property Owner or Authorized Agent

LICENSED CONTRACTOR'S DECLARATION

I hereby affirm under penalty of perjury that I am licensed under provisions of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code, and my license is in full force and effect.

Lic. Class B + VARIOUS Lic. No. 89

Exp. Date 5/31/17 Contractor

ASBESTOS DECLARATION

Written asbestos notification pursuant to Part 61 of Title 40 of the Code of Federal Regulations is required when asbestos exists in buildings, or portions thereof, undergoing demolition. I hereby declare that demolition authorized by this permit is from construction that (☐ does) (☐ does not) contain asbestos, or that ☐ no demolition is authorized by this permit.

I certify that I have read this application and affirm under penalty of perjury that the above information is correct. I agree to comply with all local Ordinances and State laws relating to building construction. I hereby authorize representatives of the County of Sonoma to enter upon the above-mentioned property for inspection purposes. If, after making the Certificate of Exemption for the Worker's Compensation provision of the Labor Code I should become subject to such provisions, I will forthwith comply. In the event I do not comply with the Workman's Compensation law, this permit shall be deemed revoked.

[signature], PE
PERMITTEE SIGNATURE

16109 HEALDSBURG AVE, HEALDSBURG 95448
ADDRESS CITY ZIP

☐ Contractor ☐ Owner ☑ Other Licensed Professional

☑ Plans Approved ☐ No Plans Subject to Field Inspection		☐ Post FIRM ☐ Pre FIRM	☐ Alquist Priolo Report Available ☐ Geotechnical report Available		
Plan Check Cleared By [signature] for YT	Date: 6/26/17	Type of Construction	Occupancy	No. of Stories	No. of Bedrooms
Permit Cleared for Issuance By SH	Date: 6/28/17	Auto. Fire Sprinklers Req'd	No of Units	Certificate of Occupancy	

Machine Space for Permit Fee
223012 ... PERMIT AND RESOURCE MANAGEMENT

cmuller s:\handouts\css\CIS-007.cdr Revised: 01/29/2009

JOB ADDRESS: 17250 Hwy 1, Jen
PERMIT NUMBER: GRD17-0074
INSPECTION AREA:

THIS PERMIT SHALL EXPIRE IN THREE(3) YEARS FROM DATE FEES ARE PAID UNLESS OTHERWISE NOTED BY CODE ENFORCEMENT

Distribution: White - File Canary - Applicant Blue - Assessor Cardstock - Inspector

Grading & Drainage Supplemental Information

GRD - 005

Project Information GR017-0074

PLP15-0079
Name of Project or Development

109-120-009
Assessor's Parcel Number(s)

~~17500~~ HWY. 1
Project Site Address
17250

JENNER
City/Town

Project Description: EXCESS FILL PLACEMENT FROM SOIL NAIL PROJECT

Drainage report included with application? Yes ☑ No ☐
Soils report included with application? Yes ☐ No ☑

Project located in a special flood hazard area? Yes ☐ No ☑
Project located in the flood-prone urban area?[1] Yes ☐ No ☑

Total Cut:	0	Cubic Yards
Total Fill[2]:	12907	Cubic Yards
Disturbed Area:	0.73	Acres

[1] See map on reverse of this form for location of the flood-prone urban area

[2] Includes native material, import, and baserock/gravel quantities

PRMD staff will forward comments and questions regarding the plans and specifications to the plan preparer of the project. Please indicate who the plan preparer is and provide their contact information:

☐ Owner ☐ Applicant ☑ Engineer ☐ Architect ☐ Contractor ☐ Other: _____

TOM ATTERBURY
Name

ta@atterburyandassociates.com
Email Address

ATTERBURY & ASSOCIATES, INC.
Company

707-433-0134
Phone

707-433-0135
Fax

16109 HEALDSBURG AVE.
Mailing Address

HEALDSBURG
City/Town

CA
State

95448
Zip

---------- ∪ DO NOT WRITE BELOW THIS LINE - To Be Completed by PRMD Staff ∪ ----------

Total volume quantity used for fee calculations:		Cubic Yards

For cut and fill on the same site, the fee shall be based on the greater volume of total cut or total fill.

Type of Grading: Regular ☐ Engineered ☐

Planning File # : _____

Permit # : _____

Comments:

Sonoma County Permit and Resource Management Department
2550 Ventura Avenue ❖ Santa Rosa, CA ❖ 95403-2829 ❖ (707) 565-1900 ❖ Fax (707) 565-2210

ATTERBURY & ASSOCIATES, INC.
Consulting Civil Engineers – Land Planners

February 1, 2018
Jn. 17-19

Eric Doble
Permit Sonoma
2550 Ventura Avenue
Santa Rosa, CA 95403

Re: Final Letter – GRD17-0074 – 17250 Highway 1
APN. 109-120-009

Dear Mr. Doble,

Fill placement operations have been completed, and the site has been winterized with hydroseeding.

The project appears to be in substantial compliance with the approved plans, and the current County grading ordinance.

The contractor, Robert Garbocci of Granite Construction will be calling for your final inspection.

Upon completion of your inspection we respectfully request this project be finaled on your records.

Sincerely,

Thomas W. Atterbury, RCE

Cc: Robert Garbocci

16109 Healdsburg Avenue
Healdsburg, CA 95448-7060
Phone: 707-433-0134; Fax: 707-433-0135; tatterbury@aol.com; atterburyandassociates.com

CONSOLIDATED ENGINEERING
LABORATORIES

7757 Bell Road
Windsor, CA 94592

www.ce-labs.com

Date Of Issue: 1/30/2018

RE: Fort Ross Soil Nail Wall - FRSNW Dumpsite Compaction
Highway 1
Fort Ross, CA 99999

Permit N/A
CEL# 4005982PW

FINAL REPORT FOR SOIL COMPACTION TESTING SERVICES
(For Services Through 09/01/17)

In accordance with Section 1704 of the California Building Code, Consolidated Engineering Laboratories has provided the requested special inspection and testing on the subject project as listed below:

1. Soil Compaction testing

These inspections were performed by personnel under the general supervision of a Registered Civil Engineer in the State of California. Details of our work on this project are contained in our testing and inspection reports, issued during the course of construction.

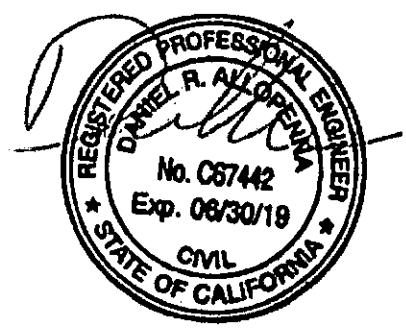
Based solely upon the inspections and tests performed and upon our substantiating reports, it is our professional judgment that the inspected work was performed substantially in conformance with the approved plans and specifications, approvals by the Engineer of Record and the applicable workmanship provisions of the California Building Code.

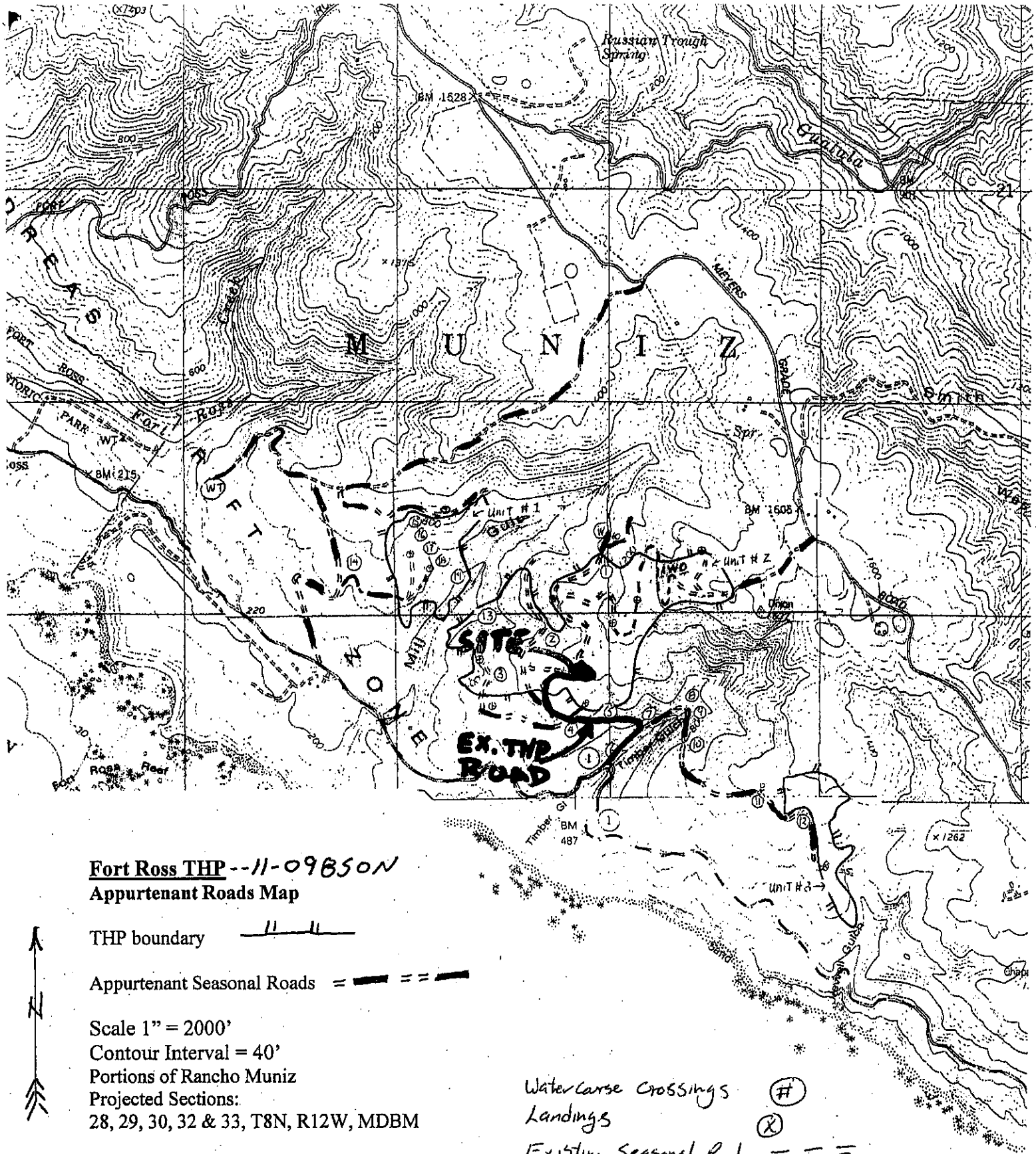
Special inspection and materials testing is the observation of construction for general conformance with the approved design drawings and specifications. It should not be relied upon by others as acceptance or as a guarantee of work, nor should it in any manner relieve any contractor, or any other party, from their obligations and responsibilities under either the construction contract or generally accepted industry custom/practice.

We appreciate the opportunity of working with you. If you have any questions or require additional information, please feel free to contact us at your convenience.

CC:
Granite Construction Company (ER)

Reviewing Engineer: Dan Allopenna, PE





Fort Ross THP --11-09BSON
Appurtenant Roads Map

THP boundary

Appurtenant Seasonal Roads

Scale 1" = 2000'
Contour Interval = 40'
Portions of Rancho Muniz
Projected Sections:
28, 29, 30, 32 & 33, T8N, R12W, MDBM

Arched Rock and Fort Ross USGS 7.5' topographic quadrangles

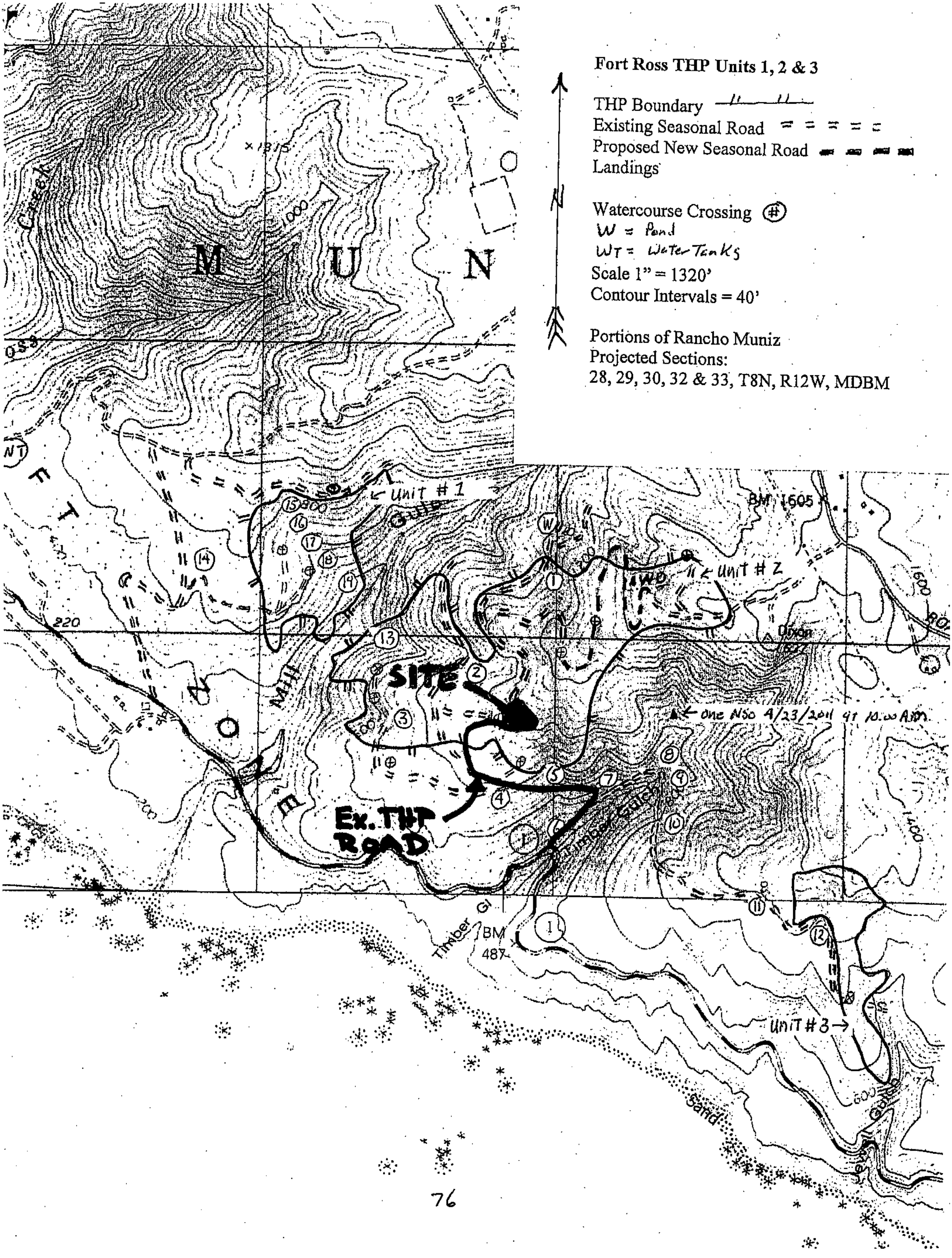
Water Tanks drafting location (WT)
Waterhole drafting location (W)

Watercarse Crossings (#)
Landings (X)
Existing Seasonal Road
Proposed new Seasonal Road

PART OF PLAN

83 Revised Nov 4, 2011

RECEIVED
NOV 17 2011
COAST AREA OFFICE
RESOURCE MANAGEMENT


Fort Ross THP Units 1, 2 & 3
THP Boundary
Existing Seasonal Road
Proposed New Seasonal Road
Landings
Watercourse Crossing (#)
W = Pond
WT = Water Tanks
Scale 1" = 1320'
Contour Intervals = 40'
Portions of Rancho Muniz
Projected Sections:
28, 29, 30, 32 & 33, T8N, R12W, MDBM
N
M
U
N
Creek
1000
← Unit # 1
← Unit # 2
Unit # 3 →
SITE
Ex. THP
ROAD
← one NSO 4/23/2011 at 10:00 AM
BM 1605
Dixon
Timber Gulch
Timber Gl
BM
487
Sand
1600
1400
600
220
200

Atterbury & Associates
Civil Engineering • Land Planning

Drainage Study Narrative

June 13th, 2017

Fort Ross CALTRANS: Fill Placement From Landslide Repair
Associated with CDOT 04-3G0804 Soil Nail Wall
PLP15-0079

Property Owner: Soper Company, (530) 675-2343
Developer: Granite Construction Company
Location: 17250 HWY 1 Jenner, CA 95450 (Mile Post 30.5)
APN: 109-120-009

Purpose Statement:

The purpose of this fill placement project is to provide a location for earth spoils left over from the landslide repair associated with CalTrans project CDOT 04-3G0804 Soil Nail Wall. The owner of the property would like to use the landing area atop the proposed fill for timber log storage.

Drainage Study Narrative:

This drainage study was conducted to address the storm water impacts of grading for the placement of earth spoils from the soil nail project on Highway 1. The project site (spoils placement site) is located in an unincorporated area of Sonoma County, north of Jenner, California. This study contains an analysis of the proposed grading and describes the projects compliance with the County of Sonoma Grading Ordinance and Low Impact design Requirements for the North Coast Region.

Granite construction, Inc. is under contract with CLATRANS to stabilize a landslide on Highway 1. Granite proposed to use this site to dispose of earth material on the same parcel as the wall. This parcel is owned by Soper Company. The project will place 12,900 cubic yards of earth spoils, covering an area of approximately 0.74 acres, or 32,000 square feet. Runoff from the project will follow the existing drainage patterns, sheet flowing off of the ridgetop down slopes ranging from 5%-40% in a westerly direction towards the Pacific Ocean. The proposed grading will not add impervious surface area of the site, and will not affect the existing drainage patterns. There are two blue-line streams that run through the parcel, one to the west of the project site and one to the east. Both streams feed into the pacific ocean. The fill placement site is at minimum 14,000 linear feet away from either blue-lined stream, see the attached watershed exhibit.

All elevations are based on LiDar mapping taken from the Sonoma VegMap online tool.

16109 Healdsburg Avenue, Suite D
Healdsburg, CA 95448-7060
Phone: 707-433-0134; Fax: 707-433-0135; Website: www.atterburyandassociates.com

Atterbury & Associates
Civil Engineering • Land Planning

10 Year and 100 Year Events Analysis:

The project does not propose any drainage improvements or affect any downstream improvements. No analysis has been conducted for the 10 year and 100 year events, as there are no points of concentration to analyze.

85th Percentile Event Analysis:

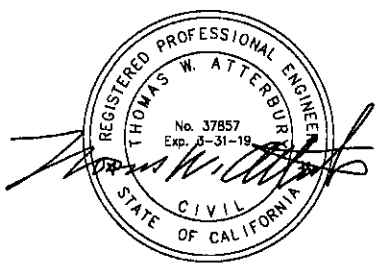
Because the project is outside of the Small MS4 Boundary, it is not subject to LID requirements. However, section 11.16.030 of the Sonoma County Grading Ordinance still applies. In order to satisfy the grading ordinance, a volume capture calculation was preformed using the Santa Rosa 85th Percentile Storm Water Runoff Calculator, and it was determined that the pre-construction and post-construction runoff volumes are equivalent.

Conclusion:

The project has no effect on the pre-development runoff, nor the capacity of any proposed or existing downstream improvements and is not subject to LID requirements.

In an effort to add tire traction, the existing access road shall be repaired/armored with 1 1/2" minus crushed rock, spread and rolled to 4-6" thick. This repair will be conducted in such a way that the length, width & design capacity are not changed (per Chapter 11 Section 11.0.4.010.C,8). The specified aggregate is absent fine binding particles found in Class 2 agg. base rock, and therefore will not wash out and create a sediment load in the ephemeral drainage which parallels the lower portion of the access road.

This access road was constructed under CalFire Timber Harvest Plan: THP-1-11-098SON.



Thomas W. Atterbury, RCE
June 13, 2017

16109 Healdsburg Avenue, Suite D
Healdsburg, CA 95448-7060
Phone: 707-433-0134; Fax: 707-433-0135; Website: www.atterburyandassociates.com

Worksheet 2: Runoff curve number and runoff

Project	By	Date
17-19: GRANITE CONSTR. FORT ROSS	C C	4/24/17
Location	**Checked**	**Date**
17250 HWY 1		

Check one: ☐ Present ☒ Developed "POST"

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN [1] Table 2-2	CN [1] Figure 2-3	CN [1] Figure 2-4	Area ☒ acres ☐ mi² ☐ %	Product of CN x area
GRP. B	HERB (FAIR)		81		3.15	255.15
GRP. B	HERB (GOOD)		74		0.67	49.58
[1] Use only one CN source per line				Totals ➡	3.82	304.73

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{304.73}{3.82} =$ _____ ; Use CN ➡ 80

2. Runoff

		Storm #1	Storm #2	Storm #3
Frequency	yr			
Rainfall, P (24-hour)	in			
Runoff, Q	in			

(Use P and CN with table 2-1, figure 2-1, or equations 2-3 and 2-4)

STORM WATER CALCULATOR*

*For example only, go to www.srcity.org/stormwaterlid for the latest version of the calculator

Project:	17-19: Granite Construction Fort Ross
Address/Location:	17250 Hwy 1 Jenner, CA
Designer:	TA
Date:	June 13, 2017
Inlet Number/Tributary Area/BMP:	Line of Analysis

NOTE: In order for this calculator to function properly **macros must be enabled.**

Physical Tributary Area that drains to Inlet/BMP = **166,399** ft²

This portion of the Storm water Calculator is designed to account for pollution prevention measures implemented on site. Additional information and description of these measures can be found in the Fact Sheets in Appendix E and in Chapter 4 of the narrative.

Disconnected Roof Drains [1]

Input:

Select disconnection condition: **Runoff is directed across landscape; Width of area: 5' to 9'**

Condition Factor = **0.25**

Method 1: Based on the total rooftop drainage area - to be used if rooftop information is known.

Input:

Enter amount of rooftop area that drain to disconnected downspouts = **0** ft²

Rooftop Area Factor = **0.00** Rooftop Area Factor= (Total Rooftop Disconnected Area/Tributary Area)

Solution:

Area reduction = (Physical Tributary Area x Conditional Factor x Rooftop Area Factor)

(166,399 x 0.25 x 0.00) = **0.00** ft² **Rooftop Drainage Area Reduction**

Method 2: Based on density (units per acre) - to be used if rooftop information is unknown.

Input:

Enter percent of rooftop area to be disconnected from downspouts: **0** %

Select Density: **3-4** Units per Acre

Density Reduction Factor= **0.19**

NOTE:
Either Method 1 (rooftop area) or Method 2 (density) can be used. Providing input for both methods will cause an error. If rooftop area information is available, Method 1 should be used.

Solution:

Area reduction = (Physical Tributary Area x Conditional Factor x Percent Disconnected x Density Factor)

(166,399 x 0.25 x 0.00 x 0.19) = **0.00** ft² **Density Reduction**

[1] *See "Impervious Area Disconnection" Fact Sheet in Appendix E for further details.*

[2] See "Interceptor Trees" Fact Sheet in Appendix E for further details and see "Plant and Tree List" in Appendix G for approved trees.

[3] See "Vegetated Buffer Strip" and "Bovine Terrace" Fact Sheets in Appendix E for further details.

[4] *Total area reductions due to pollution Prevention Measures cannot exceed 50% of the physical Tributary Area.*

[5] *Per the "Urban Hydrology For Small Watersheds" TR-55 manual.*

[6] *Q in feet of depth as defined by the "Urban Hydrology For Small Watersheds" TR-55 Manual.*

[7] *From Sonoma County Water Agency Flood Control Design Criteria.*

[8] *Hydrologic soil type based of infiltration rate of native soil as defined by "Urban Hydrology For Small Watersheds" TR-55 Manual.*

[9] *Composite CN calculated per "Worksheet 2 Part 1 of the Urban Hydrology For Small Watersheds" TR-55 manual.*

[10] *From "Using Site Design to Meet Development Standards For Storm water Quality" by the Bay Area Storm water Management Agencies Association (BASMAA).*

Paved Area Disconnection [1]

Paved Area Type (select from drop down list): Not Directly-connected Paved Area
Multiplier = 1

Enter area of alternatively designed paved area: 0 ft²

Area Reduction = 0.00 ft²

INSTRUCTIONS:
Calculates the area reduction credit for driveways designed to minimize runoff. Enter type and area of alternate design.

Interceptor Trees [2]

Number of new ***Evergreen Trees*** that qualify as interceptor trees= 0 **New Evergreen Trees**

Area Reduction due to new Evergreen Trees= 0 ft² (200 ft²/tree)

Number of new ***Deciduous Trees*** that qualify as interceptor trees= 0 **New Deciduous Trees**

Area Reduction due to new Deciduous Trees= 0 ft² (100 ft²/tree)

Enter square footage of qualifying **existing tree canopy** = 0 **Existing Tree Canopy**

Allowed reduction credit for existing tree canopy= 0 ft² Allowed credit for existing tree canopy = 50 % of actual canopy square footage

Area Reduction = 0 ft² = Sum of areas managed by evergreen + deciduous + existing canopy

NOTE:
Total Interceptor Area Reduction is limited to 50% of the physical tributary area.

INSTRUCTIONS:
Calculates the area reductions credit due to interceptor trees. Includes both new and existing trees. Enter the number of new deciduous and evergreen trees and the canopy area of existing trees.

Buffer Strips & Bovine Terraces [3]

Enter area draining to a Buffer Strip or Bovine Terrace = 0 ft²

Buffer Factor = 0.7

Solution:

Area Reduction = (Area draining to Buffer Strip or Bovine Terrace) x (Buffer Factor) =

Area Reduction = 0.00 ft²

INSTRUCTIONS:
Calculates the area reduction credit due to buffer strips and/or bovine terraces. Runoff Must be direct to these features as sheet flow. Enter the area draining to these features.

Revised Tributary Area due to Pollution Prevention Measures

Physical Tributary Area = 166,399 ft²

Tributary Area Reduction due to Pollution Prevention Measures [4] = 0.00 ft²

Reduced Tributary Area to be used for Calculations = 166,399 ft²

This worksheet calculates the quantity of storm water that needs to be addressed (captured and/or treated) to comply with the NPDES Storm Water Permit issued to the City of Santa Rosa and County of Sonoma by the North Coast Regional Water Quality Control Board.

Design Goal: 100% Volume Capture

Capture (infiltration and/or reuse) of 100% of the volume of runoff generated by the 85th percentile 24 hour storm event.

Formulas:

$$S = \frac{1000}{CN} - 10$$

Where:
S= Potential maximum retention after runoff (in)[5]
CN= Curve Number [5]

$$Q = \frac{[(P*K)-(0.2*S)]^2}{[(P*K)+(0.8*S)]} \times \frac{1ft}{12"}$$

Where:
Q= Runoff depth (ft) [6]
P= Precipitation (in) = 0.92
K= Seasonal Precipitation Factor [7]

0.92 inches in the Santa Rosa area, based on local historical data.

$$V = (Q)(A_r)$$

Where:
V= Volume of Storm Water to be Retained (ft³)
A_r= Reduced Tributary Area including credit for Pollution Prevention Measures (ft²)

Input: (Pick data from drop down lists or enter calculated values)

A_r = 166,399 ft²
K [7] = 1.00

Drop down Lists

Select post development hydrologic soil type within tributary area [8] = B: 0.15 - 0.30 in/hr infiltration (transmission) rate
Select post development ground cover description [5] = Open Space (lawns, parks, golf courses, cemeteries, etc.) - Poor (<50% grass cover)

CN_{POST} = 79

OR: Composite post development CN [9] =

NOTE:
Entering a calculated composite CN will override selections made from the pull down menu above. Calculation worksheet should be used for all composite calculations and included with submittal.

Solution:

Volume of storm water - Post Development

S_{POST}= 2.66 in

$$S_{POST} = \frac{1000}{79} - 10$$

Where:
S_{POST}= Post development potential maximum retention after runoff (in).

Q_{POST}= 0.00412 ft

$$Q_{POST} = \frac{[(0.92*1.00)-(0.2*2.66)]^2}{[(0.92*1.00)+(0.8*2.66)]} \times \frac{1ft}{12in}$$

Q_{POST}= *Q in feet of depth as defined by the "Urban Hydrology For Small Watersheds" TR-55 Manual.*

V_{GOAL}= 685.56 ft³

V_{GOAL}= (0.00412)(166,399)

V_{GOAL}= Post Development Volume of Storm Water to be Retained (ft³)

INSTRUCTIONS:
This Design Goal of 100% Capture is the ideal condition and if achieved satisfies all requirements so that no additional treatment is required and pages 4 and 5 of this calculator do not need to be completed.

NOTE:
If the Design Goal of 100% Capture is not achieved, 100% Treatment AND Volume Capture must be achieved and both pages 4 and 5 of this calculator need to be completed.

Requirement 1: 100% Treatment

Treatment of 100% of the flow generated by 85th percentile 24 hour mean annual rain event (0.2 in/hr).

Formula:

$Q_{TREATMENT}$= (0.2 in/hr)(A_T)(C_{POST})(K) cfs

Where:

$Q_{TREATMENT}$= Design flow rate required to be treated (cfs)

C_{POST} = Rational method runoff coefficient for the developed condition[10]

A_T = Reduced Tributary Area including credit for Pollution Prevention Measures (in Acres)

K = Seasonal Precipitation Factor[7]

C value note:

The C value used for this calculation is smaller than the value used for hydraulic Flood Control design.

The table of values can be found here

This smaller value should not be used to size the overflow bypass.

Input:

A_T =	166,399 ft² =	3.82	Acres
C_{POST}[10] =	0.90		
K[7] =	1.0		

Solution:

$Q_{TREATMENT}$= 0.68760 cfs

$Q_{TREATMENT}$= (0.2)(3.82)(0.90)(1.00)

NOTE:

The Flow Rate calculated here should only be used to size the appropriate BMP. All associated overflow inlets and systems should be sized for the Flood Control event.

INSTRUCTIONS:

If the Design Goal of 100% Capture on page 3 of this calculator is not achieved; then Requirement 1-100% Treatment, this page of the calculator, AND Requirement 2- Volume Capture, page 5 of the calculator, **must** be achieved.

Requirement 2: Delta Volume Capture

No increase in volume of runoff leaving the site due to development for the 85th percentile 24 hour storm event.

INSTRUCTIONS:
If the Design Goal of 100% Capture on page 3 of this calculator is not achieved; then Requirement 1-100% Treatment, page 4 of the calculator, AND Requirement 2- Volume Capture, this page of the calculator, **must** be achieved.

NOTE:
If the amount of volume generated after development is less than or equal to that generated before development, Requirement 2-Volume Capture is not required.
($C_{POST} \leq C_{PRE}$ *or* $CN_{POST} \leq CN_{PRE}$)

Formulas:

$$S = \frac{1000}{CN} - 10$$

Where:
S= Potential maximum retention after runoff (in)[5]
CN= Curve Number [5]

$$Q = \frac{[(P*K)-(0.2*S)]^2}{[(P*K)+(0.8*S)]} \times \frac{1ft}{12in}$$

Where:
Q= Runoff depth (ft) [6]
P= Precipitation (in) = 0.92 *0.92 inches in the Santa Rosa area, based on local historical data.*
K= Seasonal Precipitation Factor [7]

$$V = (Q)(A_r)$$

Where:
V= Volume of Storm Water to be Retained (ft^3)
A_r= Reduced Tributary Area including credit for Pollution Prevention Measures (ft^2)

Input: (Pick data from drop down lists or enter calculated values)

A_r =	166,399	ft^2
K [7] =	1.0	

Drop down Lists

Select hydrologic soil type within tributary area [5] =	C: 0.05 - 0.15 in/hr infiltration (transmission) rate
Select predevelopment ground cover description [5] =	Residential - 1 acre lots
Select post development ground cover description [5] =	Residential - 1/8 acre or less (town houses)
CN_{PRE} =	79
CN_{POST} =	90
OR Composite Predevelopment CN [9] =	81
Composite Post development CN [9] =	80

Solution:

Pre Development Storm Water Runoff Volume

S_{PRE}= 2.35 in

$$S_{PRE} = \frac{1000}{81} - 10$$

Where:
S_{PRE}= Pre development potential maximum retention after runoff (in).

Q_{PRE}= 0.00603 ft

$$Q_{PRE} = \frac{[(0.92*1.00)-(0.2*2.35)]^2}{[(0.92*1.00)+(0.8*2.35)]} \times \frac{1ft}{12in}$$

Q_{PRE}= *Q in feet of depth as defined by the "Urban Hydrology For Small Watersheds" TR-55 Manual.*

V_{PRE}= 1003.39 ft^3

V_{PRE}= (0.00603)(166,399)

V_{PRE}= Pre Development Volume of Storm Water Generated (ft^3)

Post Development Storm Water Runoff Volume

S_{POST}= 2.50 in

$$S_{POST} = \frac{1000}{80} - 10$$

Where:
S_{POST}= Post development potential maximum retention after runoff (in).

Q_{POST}= 0.00503 ft

$$Q_{POST} = \frac{[(0.92*1.00)-(0.2*2.50)]^2}{[(0.92*1.00)+(0.8*2.50)]} \times \frac{1ft}{12in}$$

Q_{POST}= *Q in feet of depth as defined by the "Urban Hydrology For Small Watersheds" TR-55 Manual.*

V_{POST}= 836.99 ft^3

V_{POST}= (0.00503)(166,399)

V_{POST}= Post Development Volume of Storm Water Generated (ft^3)

Solution: Volume Capture Requirement

Increase in volume of storm water that must be retained onsite (may be infiltrated or reused).

Delta Volume Capture= $(V_{POST}-V_{PRE})$

Delta Volume Capture= (836.99) - (1,003.39)

V_{DELTA}= -166.39900 ft^3

Where:
Delta Volume Capture= The increase in volume of storm water generated by the 85th percentile 24 hour storm event due to development that must be retained onsite (may be infiltrated or reused).

INSTRUCTIONS:

LID BMP Sizing Tool: 100% Volume Capture Goal; V_{GOAL}

NOTE:
LID Sizing Tool only applicable for volume based BMPs. Not required if site requires treatment only.

The 100% volume capture sizing tool helps the designer appropriately size a LID BMP to achieve the design goal of 100% volume capture of the post development condition. Enter the percent porosity of the specified soil and depth below perforated pipe (if present). The width and length entries will need to be interactively adjusted until "Percent of Goal" equals 100%.

Formulas:

$V_{LID\ GOAL}=((V_{GOAL}))/(P)$ = 2635.78 ft³

$A_{LID\ GOAL}=(W)(L)$ = 800.00 ft²

Where:
$V_{LID\ GOAL}$= Required volume of soil in LID BMP.
$A_{LID\ GOAL}$ = Footprint of LID BMP area for a given depth (below perforated pipe if present).

V_{GOAL} = 686 ft³

$$\text{Percent of Goal Achieved} = \frac{(D)(A_{LID\ GOAL})}{V_{LID\ GOAL}} \times 100$$

Where:
P= Porosity (enter as a decimal)
D= Depth below perforated pipe if present (in decimal feet)
W= Width (in decimal feet)
L= Length (in decimal feet)

Input:

P =	0.3	as a decimal
D =	3.5 ft	Below perforated pipe if present
W =	8.0 ft	
L =	100.0 ft	

Solution:

Percent of Goal Achieved = 106.19 % = [(3.5 x 800) / 2,637] x 100

LID BMP Sizing Tool Delta Volume Capture Requirement: V_{DELTA}

NOTE:
LID Sizing Tool only applicable for volume based BMPs. Not required if site requires treatment only.

INSTRUCTIONS:
The Delta Volume Capture sizing tool helps the designer appropriately size a LID BMP to achieve the design requirement of the delta volume capture. Enter the percent of porosity of the specified soil and depth below perforated pipe (if present). The width and length entries will need to be interactively adjusted until "Percent of Requirement achieved" reaches 100%.

Formulas:

$V_{LID\ DELTA}=((V_{DELTA}))/(P)$ = -639.99615 ft³

$A_{LID\ DELTA}=(W)(L)$ = 0.00 ft²

Where:
$V_{LID\ DELTA}$= Required volume of soil in LID BMP
$A_{LID\ DELTA}$ = Footprint of LID BMP area for a given depth (below perforated pipe if present).

V_{DELTA}= -166.39900 ft³

$$\text{Percent of Requirement Achieved} = \frac{(D)(A_{LID\ DELTA})}{V_{LID\ DELTA}} \times 100$$

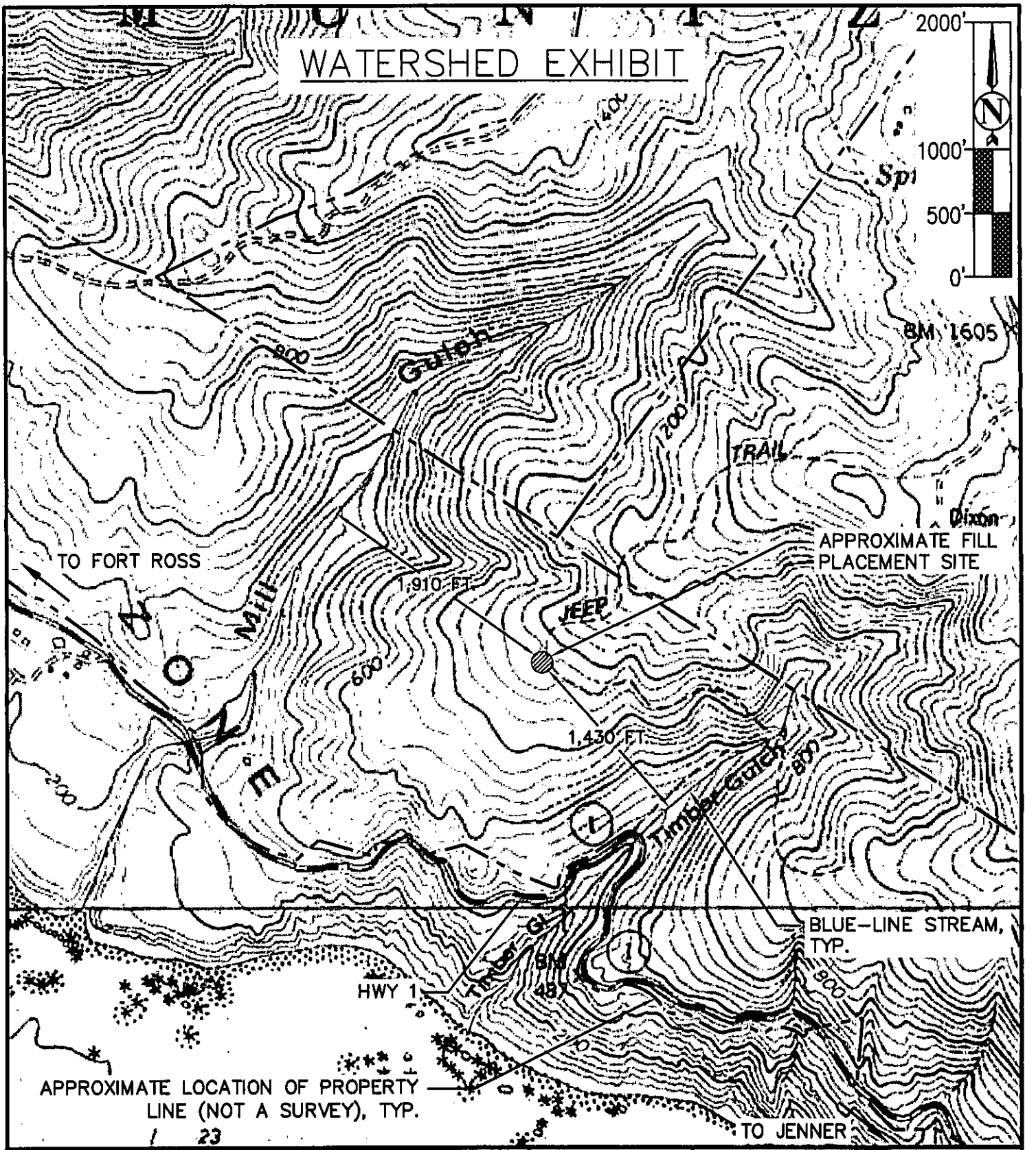
Where:
P= Porosity (enter as a decimal)
D= Depth below perforated pipe if present (in decimal feet)
W= Width (in decimal feet)
L= Length (in decimal feet)

Input:

P =	0.3	as a decimal
D =	0.0 ft	Below perforated pipe if present
W =	0.0 ft	
L =	0.0 ft	

Solution:

Percent of Requirement Achieved = 0.00 % = [(0.0 x 0) / -640] x 100



DATE: 06-13-17	JOB: 17-19	APN: 109-120-009	SCALE: 1" = 1000'	DRAWN: CC	SHEET: 1 of 1

GRANITE CONSTRUCTION
CDOT 04-3G0804, PLP15-0079
17250 HWY 1
JENNER, CA 95450

Atterbury & Associates, Inc.
Civil Engineering - Land Planning
16109 Healdsburg Avenue, Suite D,
Healdsburg, CA 95448
Phone: (707) 433-0134; Fax: (707) 433-0135

L:\17-19\Grading Plans\Watershed Exhibit\17-19_Watershed Exhibit.dwg 6/13/2017 9:10am

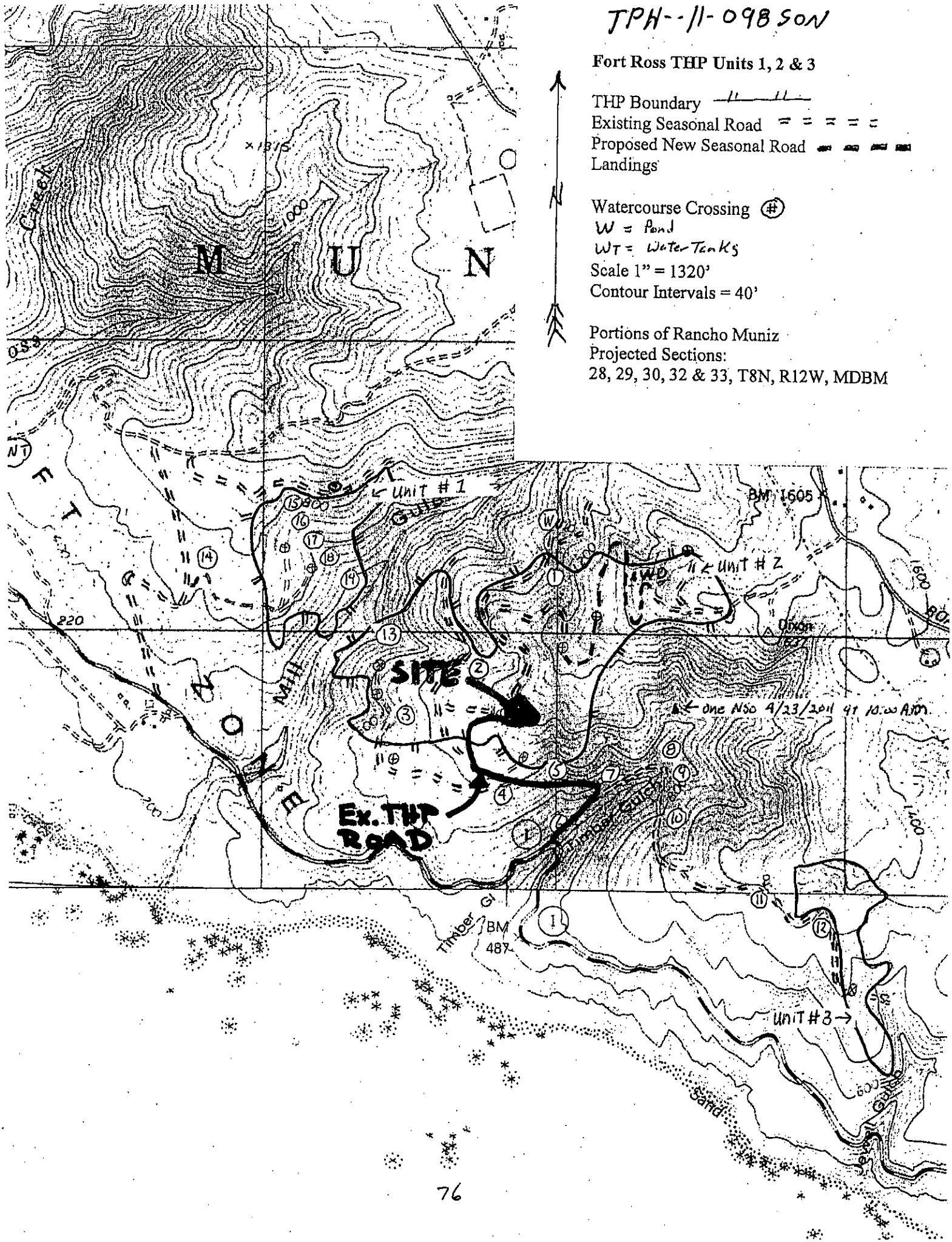
TPH--11-098 SON

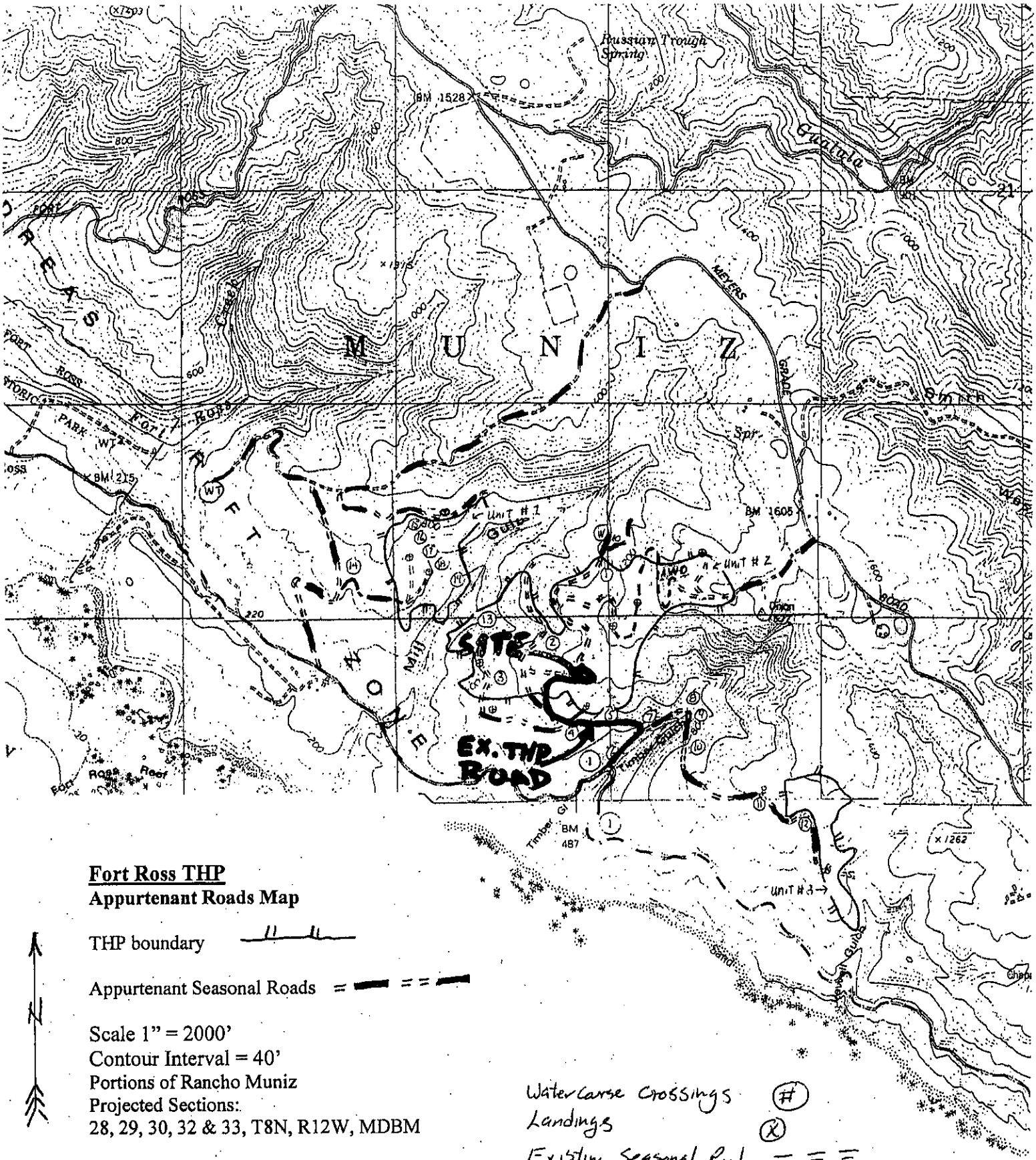
Fort Ross THP Units 1, 2 & 3

THP Boundary
Existing Seasonal Road
Proposed New Seasonal Road
Landings

Watercourse Crossing (#)
W = Pond
WT = Water Tanks
Scale 1" = 1320'
Contour Intervals = 40'

Portions of Rancho Muniz
Projected Sections:
28, 29, 30, 32 & 33, T8N, R12W, MDBM





Fort Ross THP
Appurtenant Roads Map

THP boundary

Appurtenant Seasonal Roads

Scale 1" = 2000'
Contour Interval = 40'
Portions of Rancho Muniz
Projected Sections:
28, 29, 30, 32 & 33, T8N, R12W, MDBM

Arched Rock and Fort Ross USGS 7.5' topographic quadrangles

Water tanks drafting location (WT)
Waterhole drafting location (W)

Watercarse Crossings (#)
Landings (X)
Existing Seasonal Road
Proposed new Seasonal Road

PART OF PLAN

83 Revised Nov 4, 2011

RECEIVED
NOV 17 2011
COAST AREA OFFICE
RESOURCE MANAGEMENT