

SCHEDULE OF BOULDERS

| BOULDER DESIGNATION | | LOCATION (GPS is in NAD83, degrees) | | APPROXIMATE SIZE | | | MITIGATION METHODS (See Note 1) | | | | COMMENTS |
|---------------------|---------|-------------------------------------|------------|------------------|-------------|--------------|---------------------------------|------------------------|-----------------------------------|-----------------------|--|
| BOULDERS | GROUP # | LAT | LONG | Length (ft.) | Width (ft.) | Height (ft.) | DEMOLITION | ROCK BOLT (See Note 2) | ROCK STRAPPING | PEDESTAL (See Note 3) | |
| B10 | B10 | 21.39102 | -157.74723 | 1.5 | 1.5 | 1.5 | Demo | Embedment Length | | | |
| B1-1 | B1 | 21.39070 | -157.74737 | 8.0 | 5.0 | 3.5 | | 2-15' | | | Should be covered by the structural mesh for the cut slope |
| B14-1 | B14 | 21.39097 | -157.74712 | 5.5 | 9.0 | 12.0 | | 2-20' | | | |
| B14-3 | B14 | 21.39097 | -157.74712 | 6.0 | 7.5 | 13.0 | | 2-20' | | | |
| B14-4 | B14 | 21.39097 | -157.74712 | 8.0 | 11.5 | 13.0 | | 2-20' | | | |
| B16-1 | B16 | 21.39090 | -157.74718 | 3.5 | 3.5 | 6.0 | | 1-15' | | | |
| B18 | B18 | 21.39103 | -157.74702 | 5.5 | 6.0 | 10.0 | | 2-20-25' | | | |
| B2 | B2 | 21.39063 | -157.74735 | 2.5 | 2.0 | 1.5 | Demo | | | | Out side of the rockfall fence |
| B25 | B25 | 21.39127 | -157.74672 | 2.0 | 4.5 | 8.0 | | | | | Cut the tree in its back fracture |
| B3-1 | B3 | 21.39077 | -157.74728 | 6.5 | 5.0 | 6.0 | Demo | | 4-10' anchor, 2 cables, 6 eyenuts | | Inside the rockfall fence. |
| B3-3 | B3 | 21.39077 | -157.74728 | 4.0 | 4.5 | 2.0 | | | | 3'x2'x1' | |
| B3-7 | B3 | 21.39077 | -157.74728 | 3.5 | 5.5 | 5.0 | | | | 3'x3'x4' | |
| B3-16 | B3 | 21.39077 | -157.74728 | 5.0 | 4.0 | 5.0 | | | | | Included in the site securing of B3-1 |
| B33 | B33 | 21.39138 | -157.74672 | 8.0 | 6.0 | 4.5 | Demo | 4-10' | | | The boulder that is overhang |
| B34 | B34 | 21.39142 | -157.74668 | 1.5 | 1.5 | 5.0 | Demo | | | | Cover with cable net |
| B36 | B36 | 21.39148 | -157.74672 | 6.0 | 11.0 | 18.0 | | 3-15' | | | |
| B37 | B37 | 21.39143 | -157.74673 | 5.5 | 7.5 | 11.0 | | 3-15' | | | |
| B39 | B39 | 21.39140 | -157.74687 | 4.5 | 7.0 | 16.0 | | | 4-10' anchor, 2 cables, 6 eyenuts | | |
| B6 | B6 | 21.39085 | -157.74730 | 3.0 | 3.0 | 2.5 | Demo | | | | |
| B61 | B61 | 21.39153 | -157.74665 | 2.5 | 9.0 | 18.0 | | 1-15' | 2-10' anchor, 1 cable, 4 eyenuts | | |
| B7 | B7 | 21.39095 | -157.74725 | 10.5 | 7.5 | 4.0 | | 2-15' | | | |
| B8-1 | B8 | 21.39097 | -157.74727 | 6.0 | 5.0 | 3.0 | | 2-15' | | | |
| B8-2 | B8 | 21.39097 | -157.74727 | 3.0 | 2.5 | 1.0 | Demo | | | | |
| B9 | B9 | 21.39100 | -157.74723 | 3.0 | 2.5 | 2.5 | Demo | | | | |
| B70-1 | B70 | 21.39178 | -157.74675 | 6.0 | 12.0 | 7.0 | Demo | 3-20' | | | |
| B70-2 | B70 | 21.39178 | -157.74675 | 8.0 | 4.0 | 3.0 | Demo | 2-15' | | | |
| B14-2 | | | | | | | | 2-15' | | | |
| B15 | | | | | | | | 1-15' | | | |

LEGEND FOR AS-BUILT POSTINGS

Squiggly line for as-built deletion

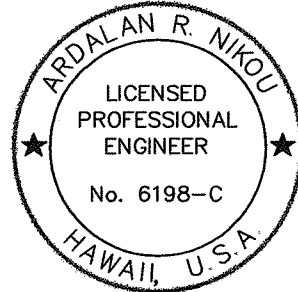
Double line for as-built deletion

Roadway Text for as-built posting

| | |
|---------|-------------------------------|
| 9/04/06 | Added Notes 2 & 3; references |
| Date | Revision |

- NOTES:
- Rock Protection Fence shall be in place and operational prior to the start of boulder mitigation.
 - Location of Rock Bolt Anchors shall be approved by the Engineer in the field. Use of anchors that are grouted simultaneously with drilling shall not be allowed.
 - Exact dimensions and location of Pedestal shall be approved by the Engineer.

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EXPIRATION DATE OF THE LICENSE 4/30/2008
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HIGHWAYS DIVISION

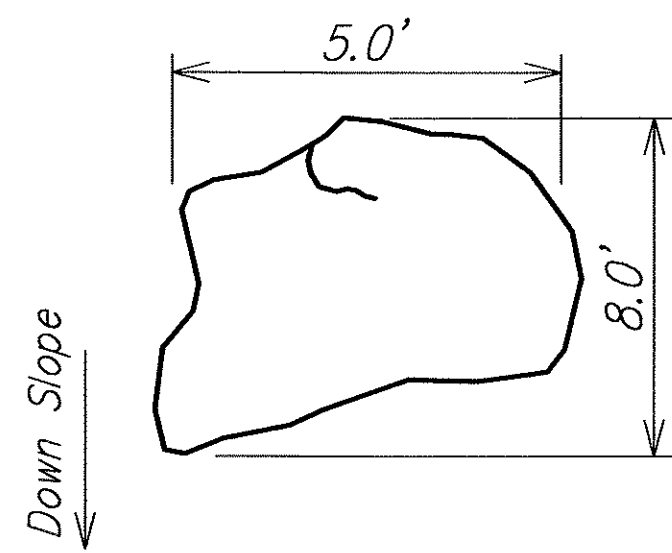
SCHEDULE OF BOULDERS

KAILUA ROAD PERMANENT
ROCKFALL AND LANDSLIDE MITIGATION
PROJECT NO. 61D-02-06

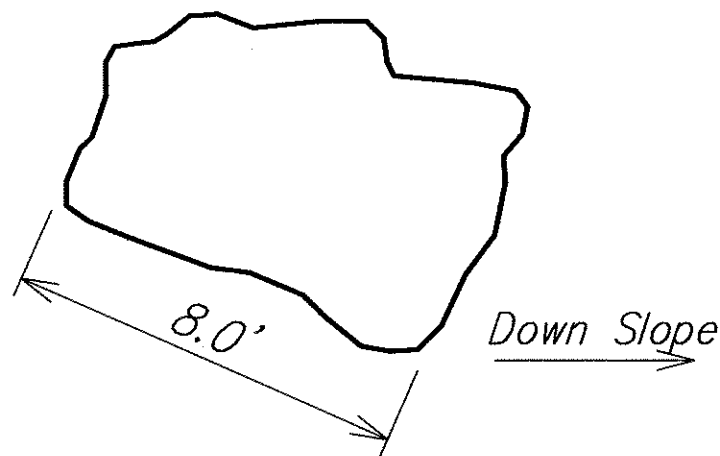
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SHEET No. 1 OF 6 SHEETS

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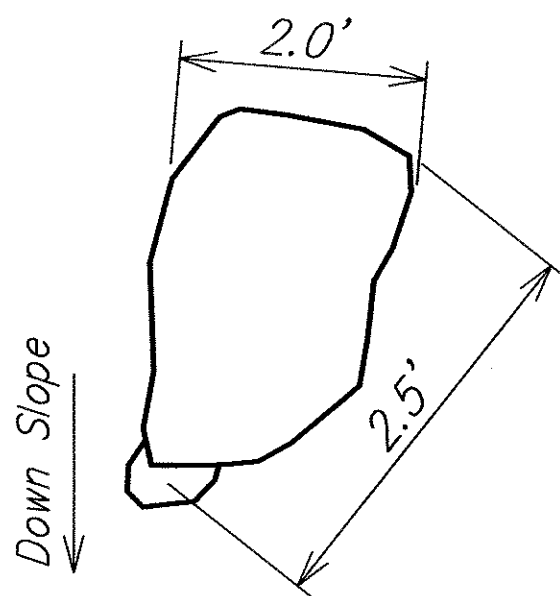


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Not to Scale

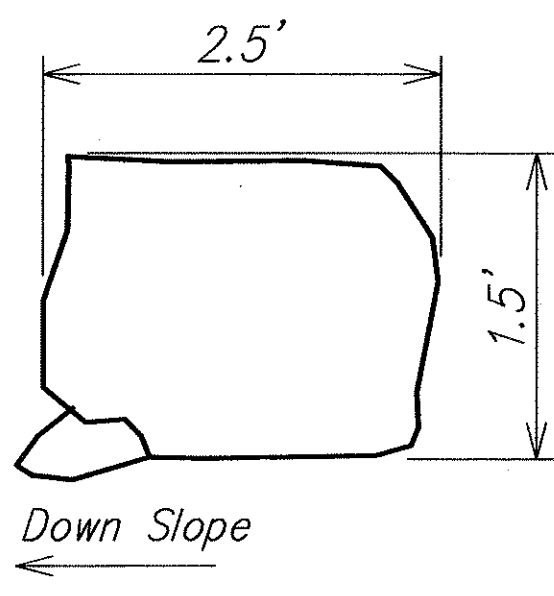


FRONT VIEW
Not to Scale

B1-1

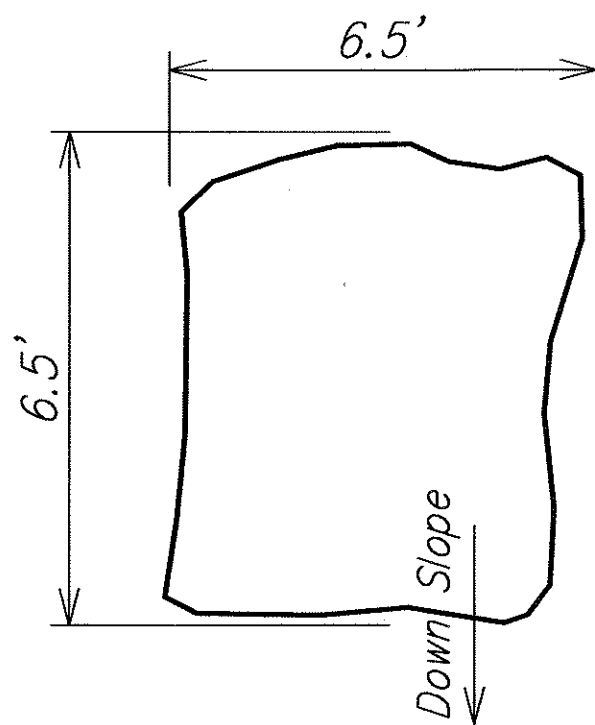
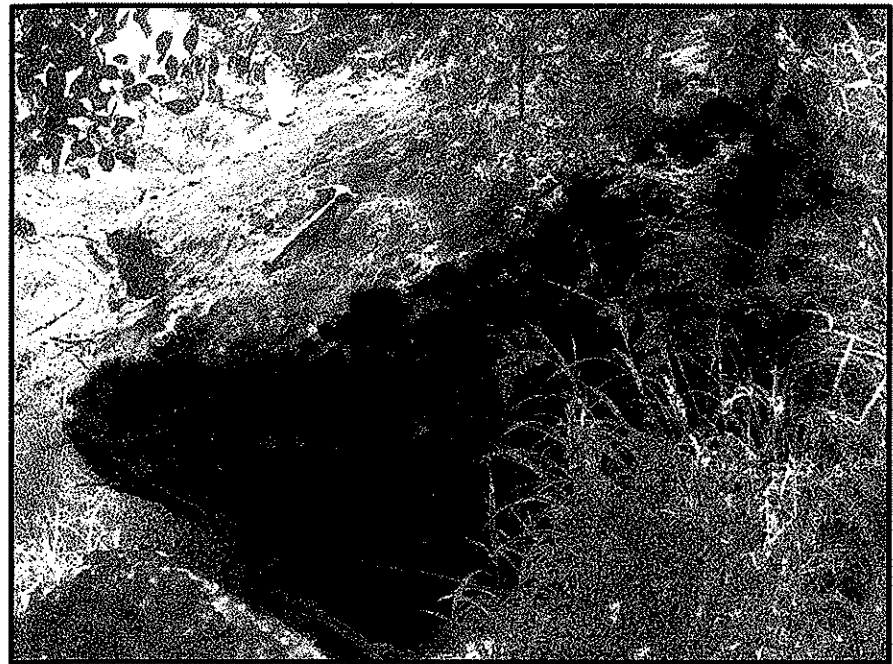


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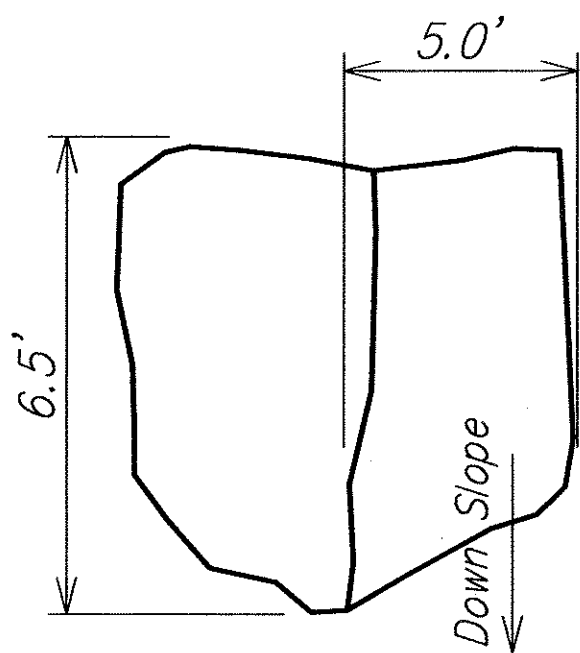


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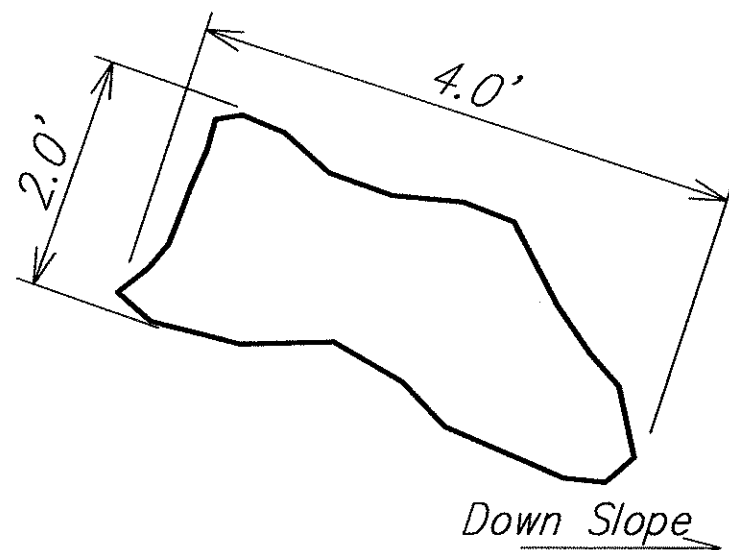


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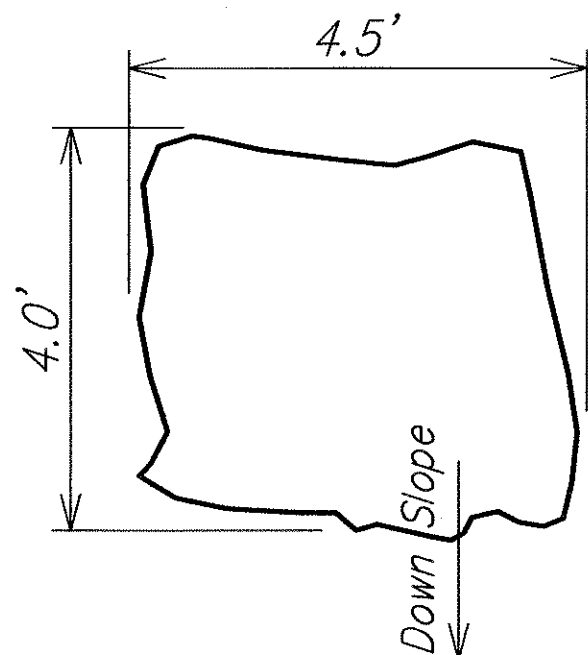


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B3-1

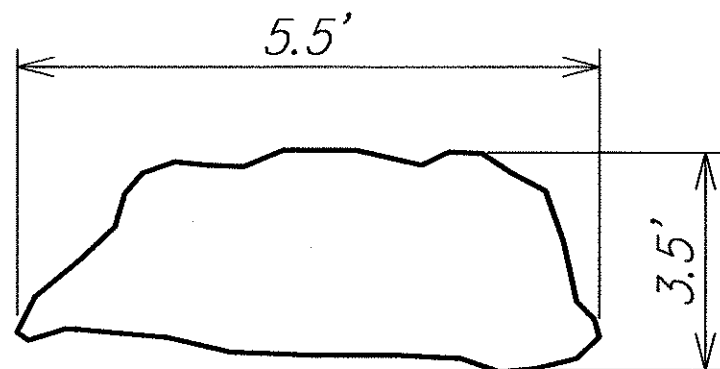


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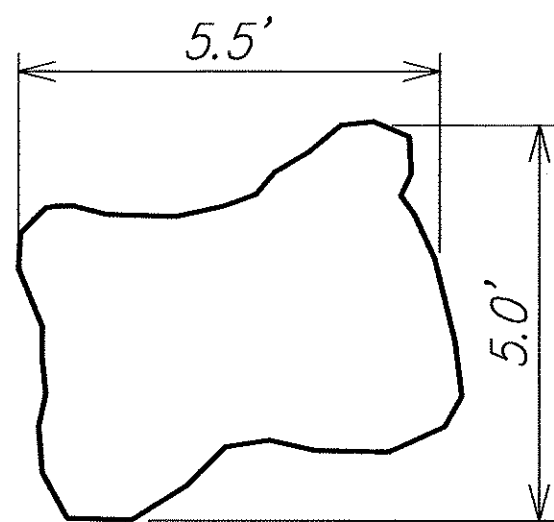


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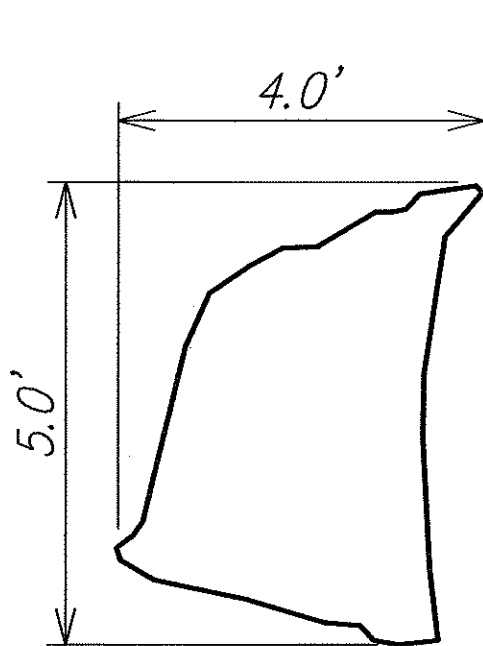


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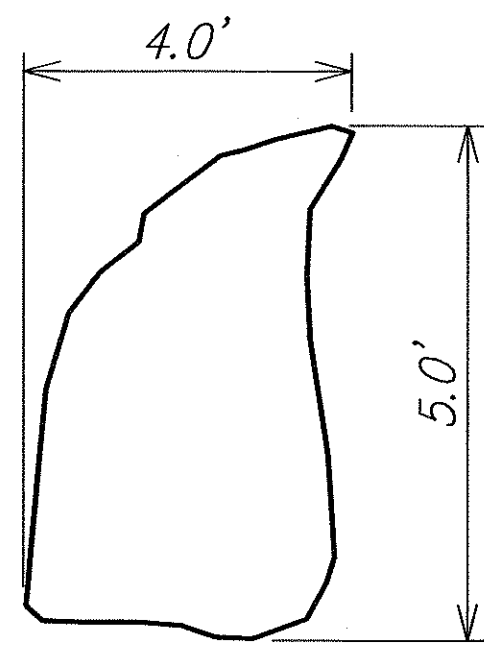


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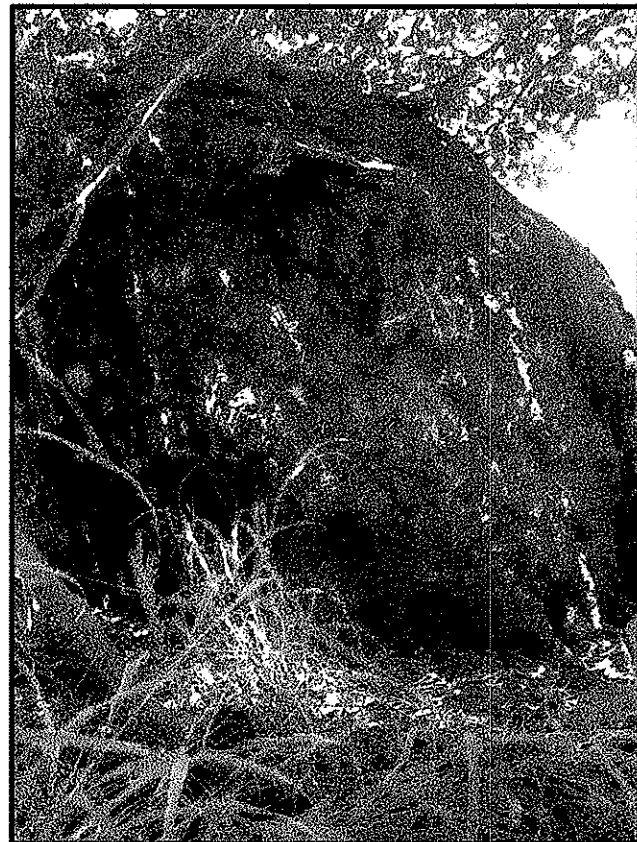
B3-7



TOP VIEW
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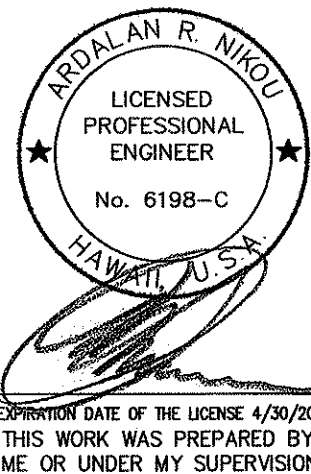


FRONT VIEW
Not to Scale



B3-16

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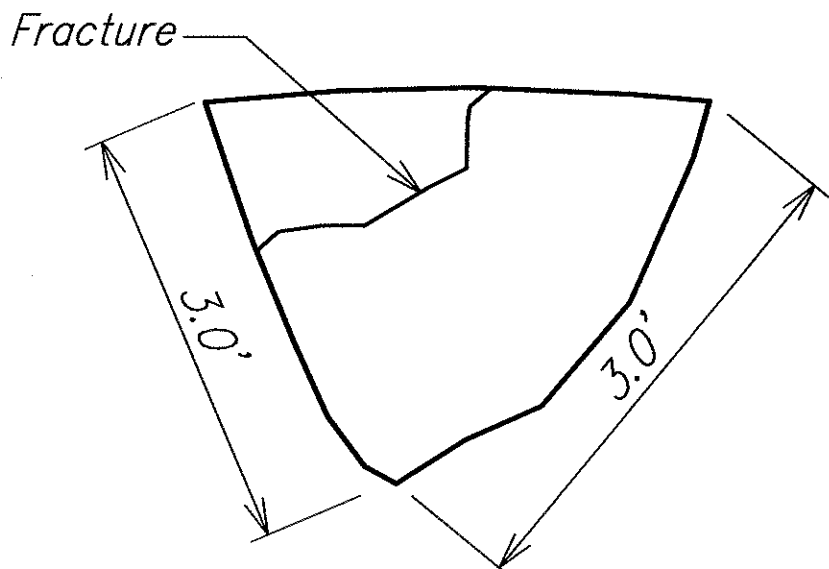
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
BOULDER DETAILS
B1-1 THRU B3-16
KAILUA ROAD PERMANENT
ROCKFALL AND LANDSLIDE MITIGATION
PROJECT NO. 61D-02-06

Scale: As Noted Date: Aug 2006
SHEET No. 2 OF 6 SHEETS

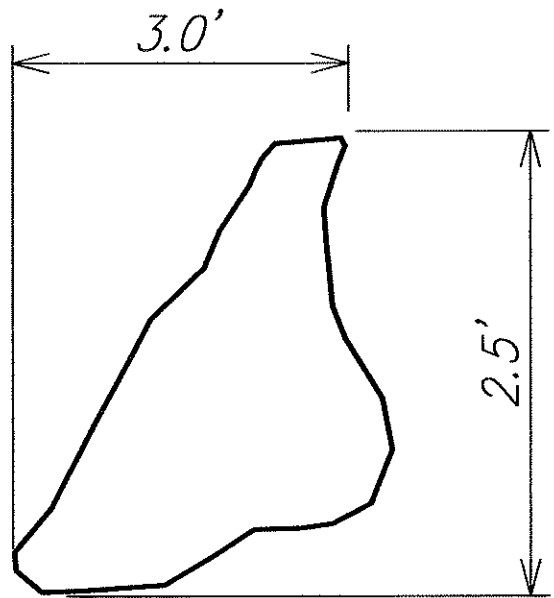
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| DESIGNED BY | DESIGNED BY | |
| CHECKED BY | CHECKED BY | |
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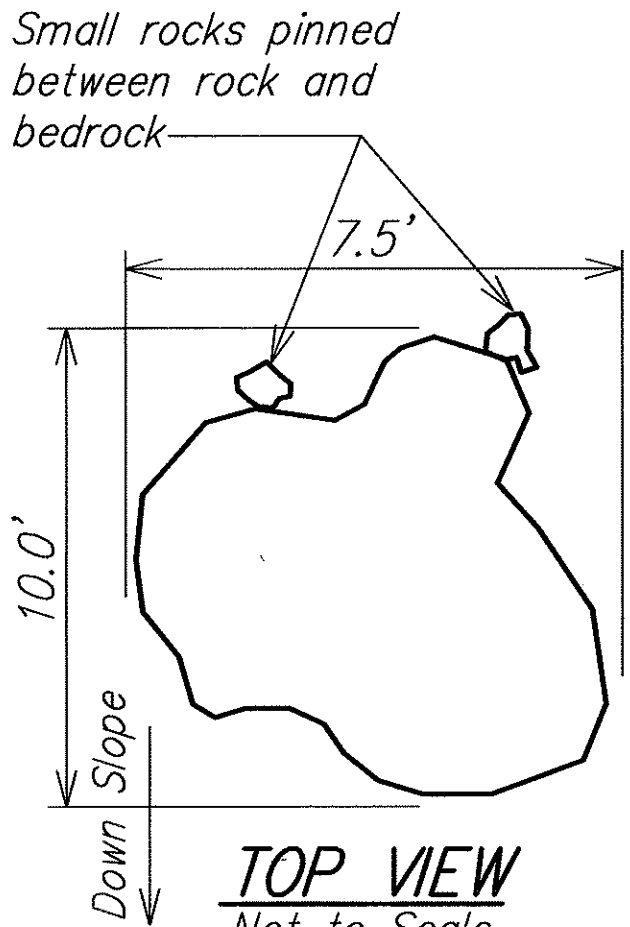


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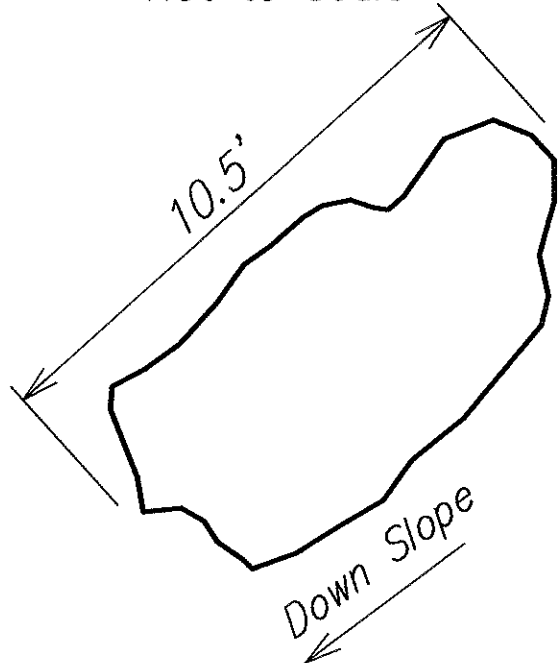


FRONT VIEW
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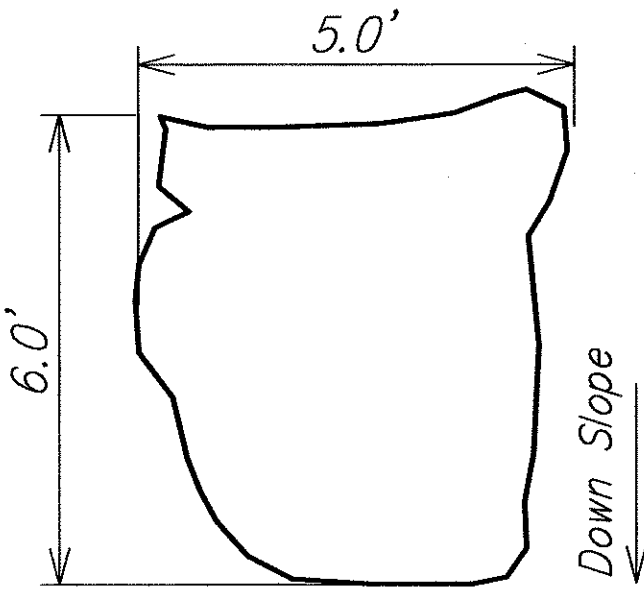


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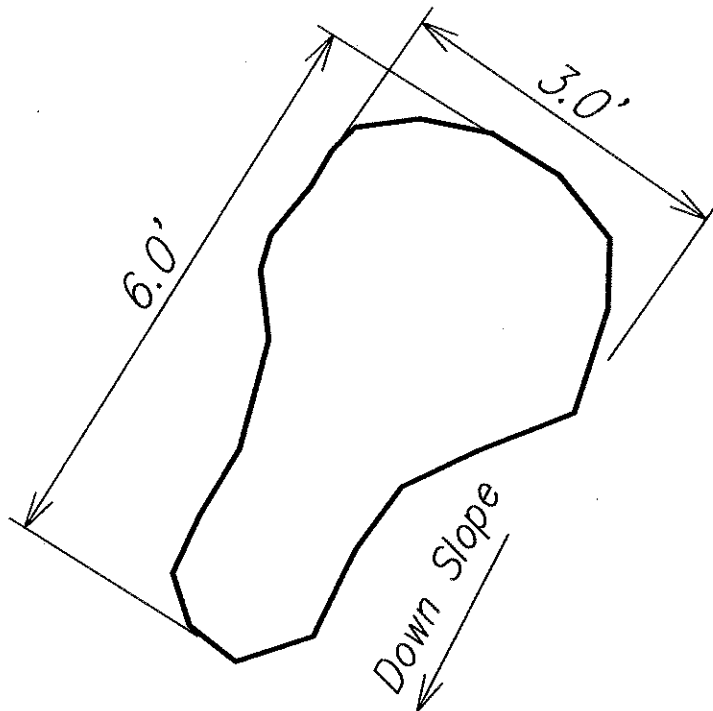


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B7

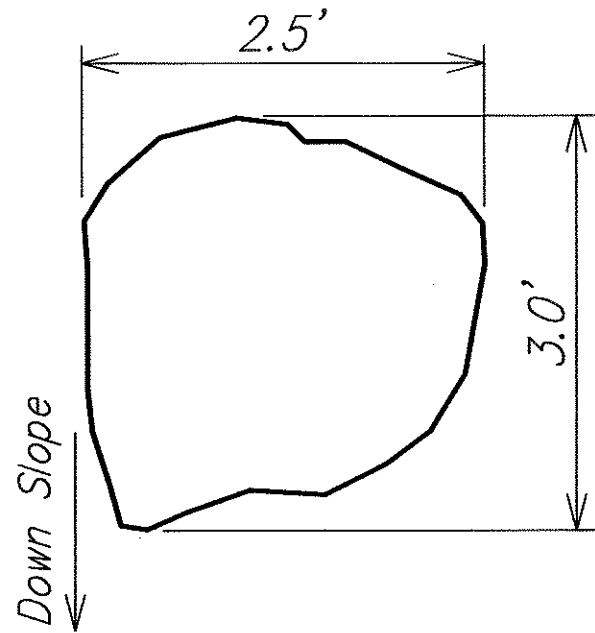


TOP VIEW
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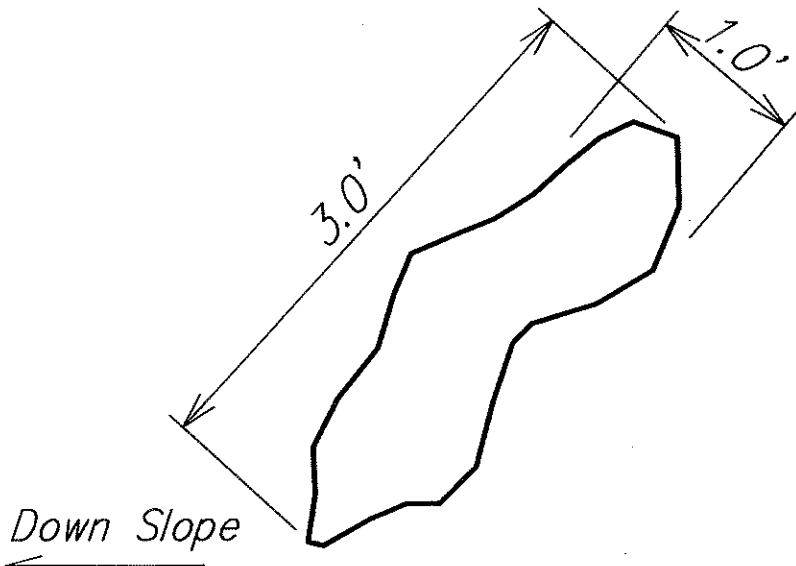


FRONT VIEW
Not to Scale

B8-1

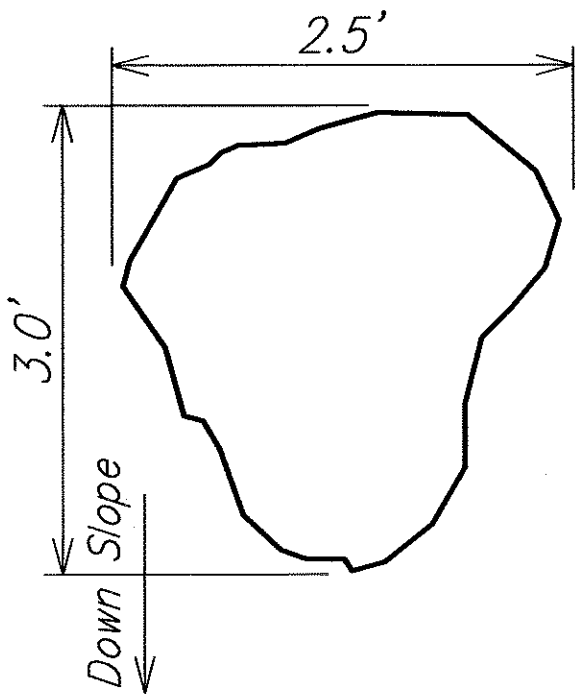


TOP VIEW
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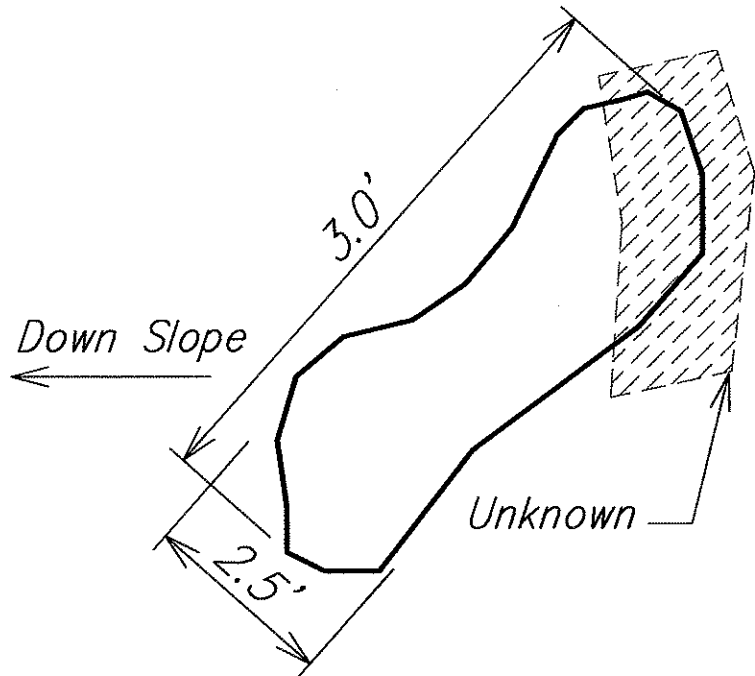


FRONT VIEW
Not to Scale

B8-2

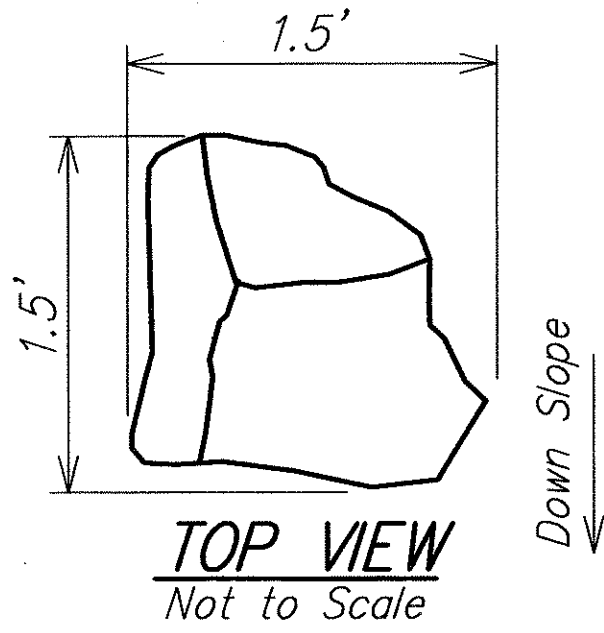


TOP VIEW
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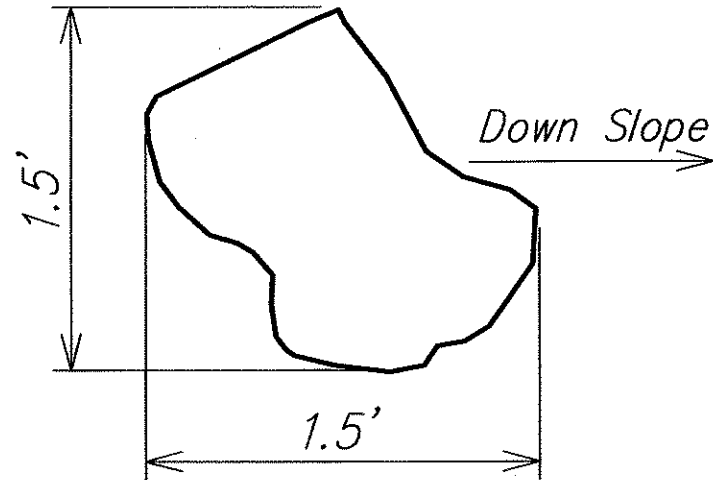


FRONT VIEW
Not to Scale

B9



TOP VIEW
Not to Scale



FRONT VIEW
Not to Scale

B10

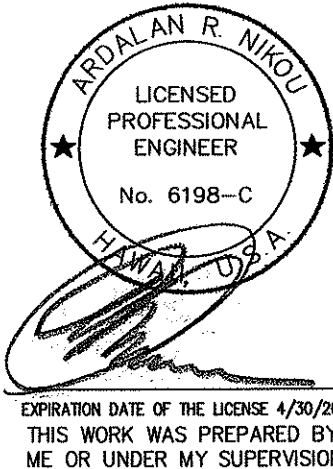
STATE OF HAWAII
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HIGHWAYS DIVISION

BOULDER DETAILS
B6 THRU B10
KAILUA ROAD PERMANENT
ROCKFALL AND LANDSLIDE MITIGATION
PROJECT NO. 61D-02-06

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SHEET No. 3 OF 6 SHEETS

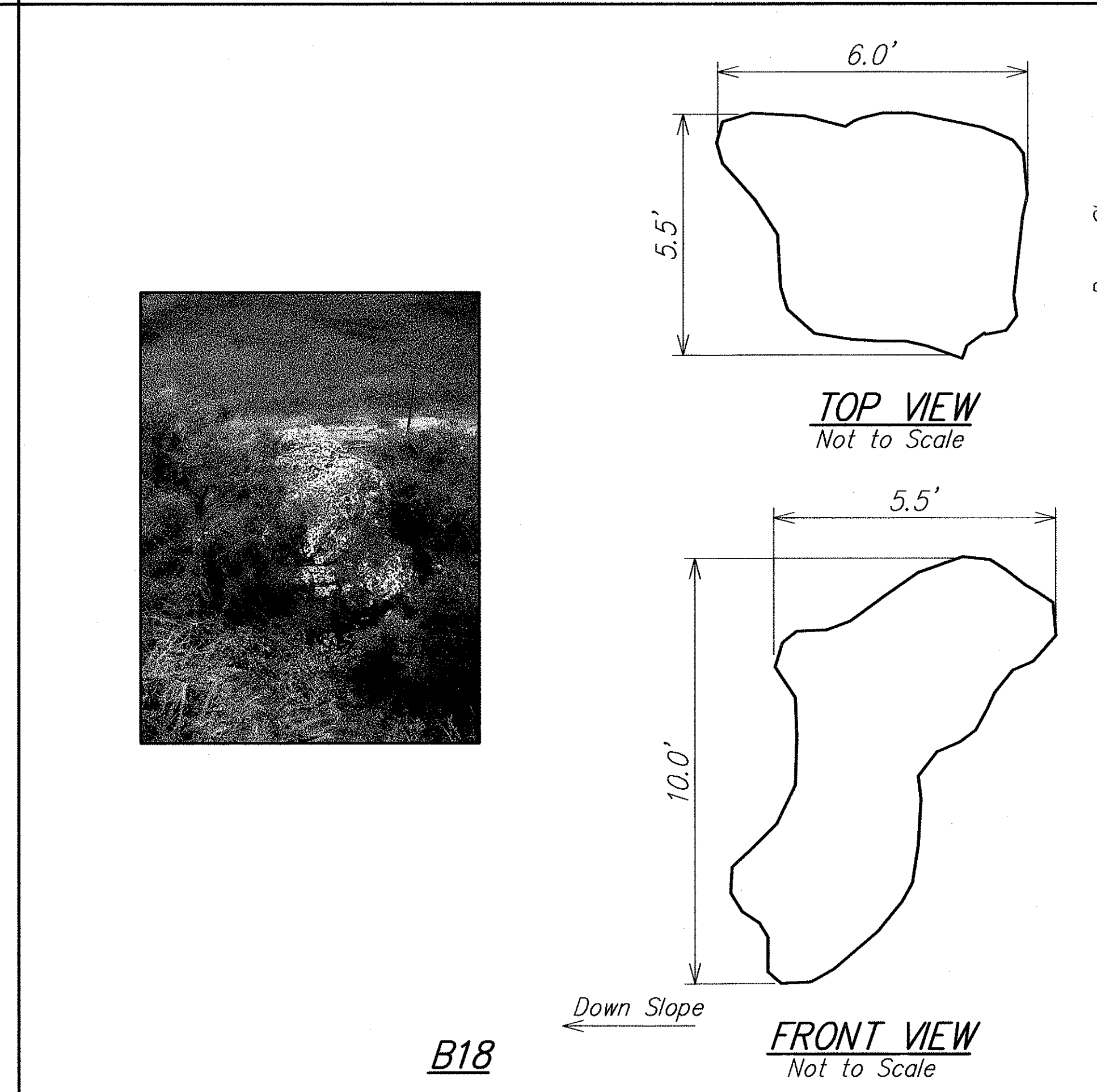
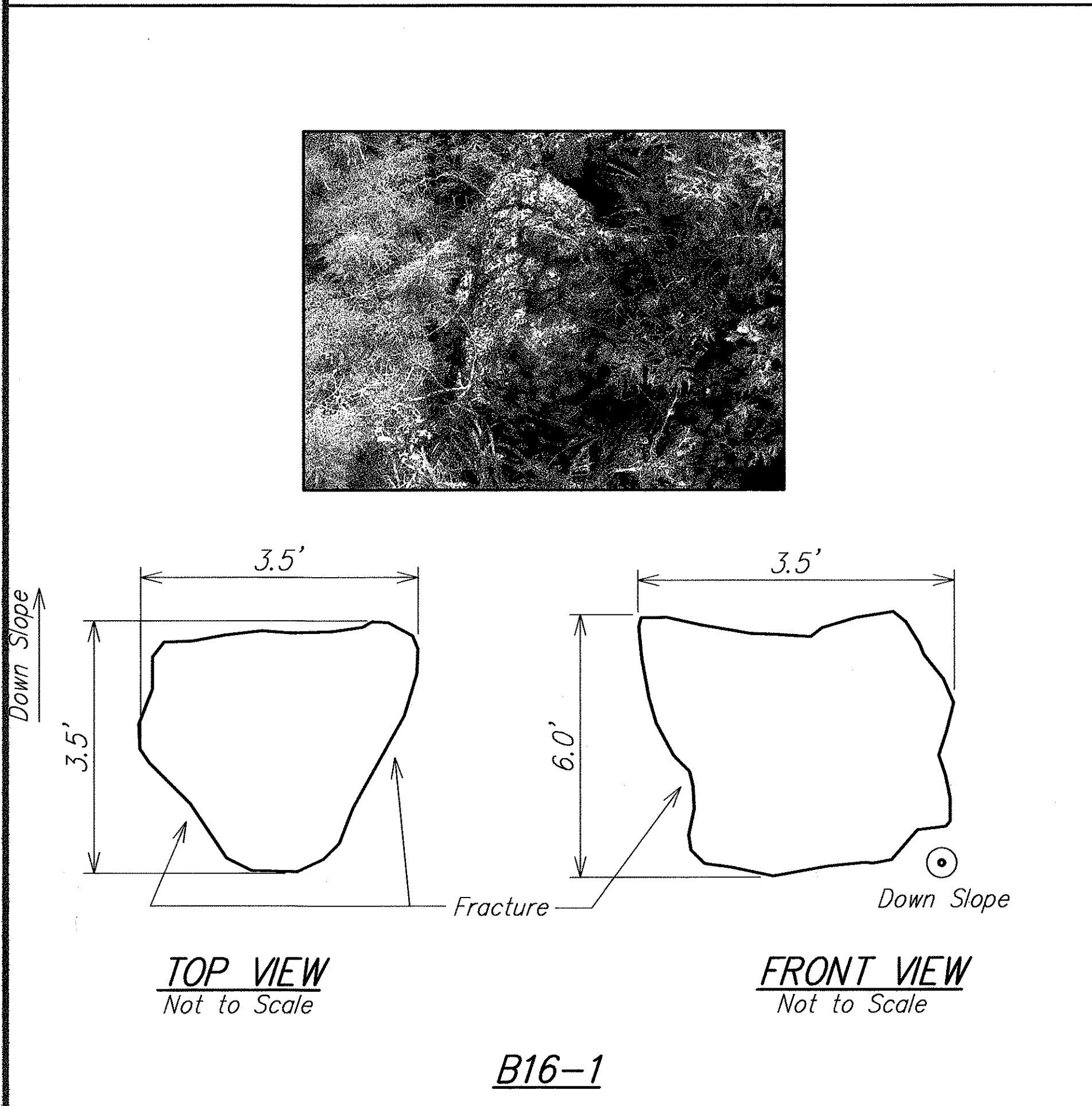
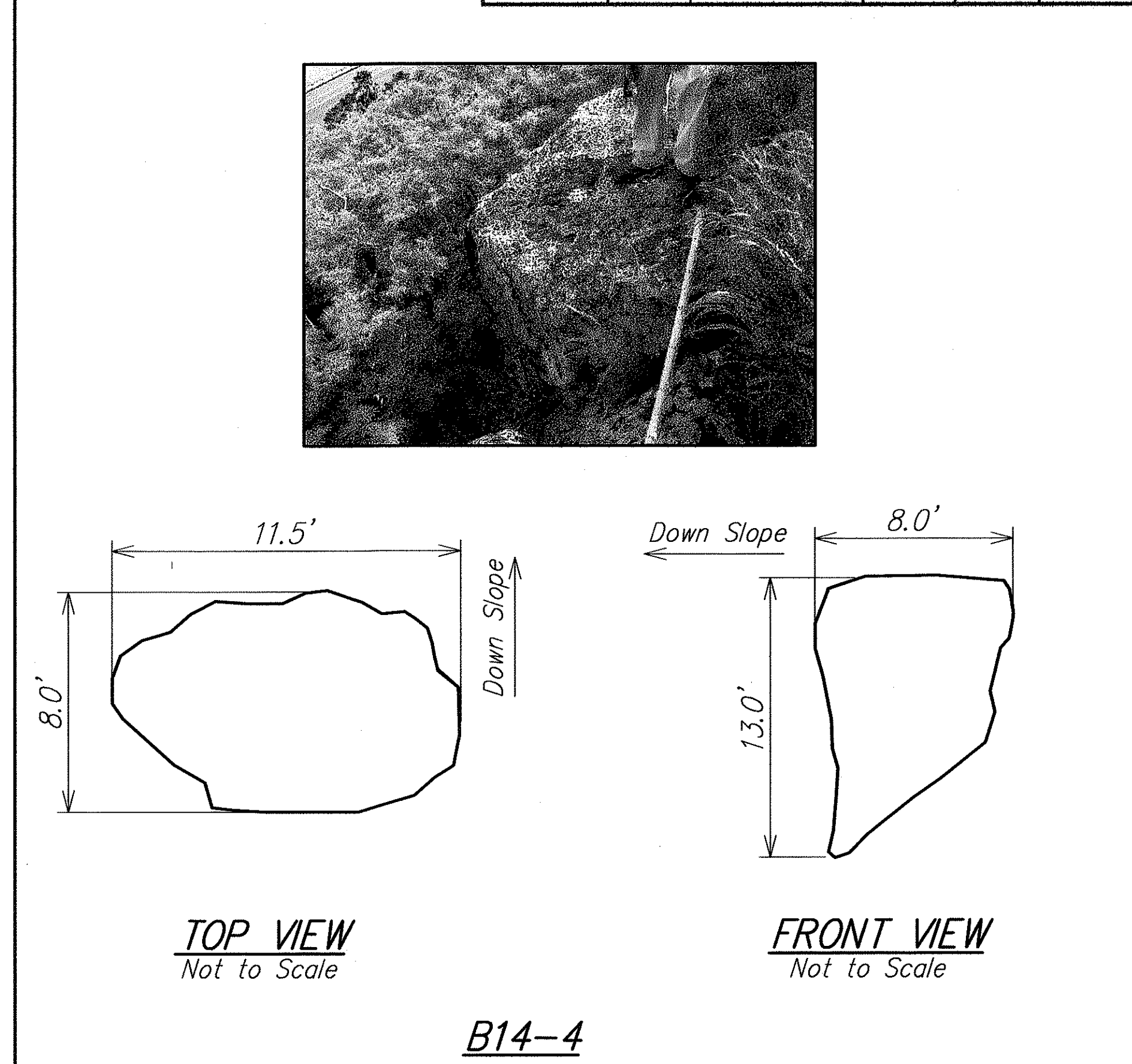
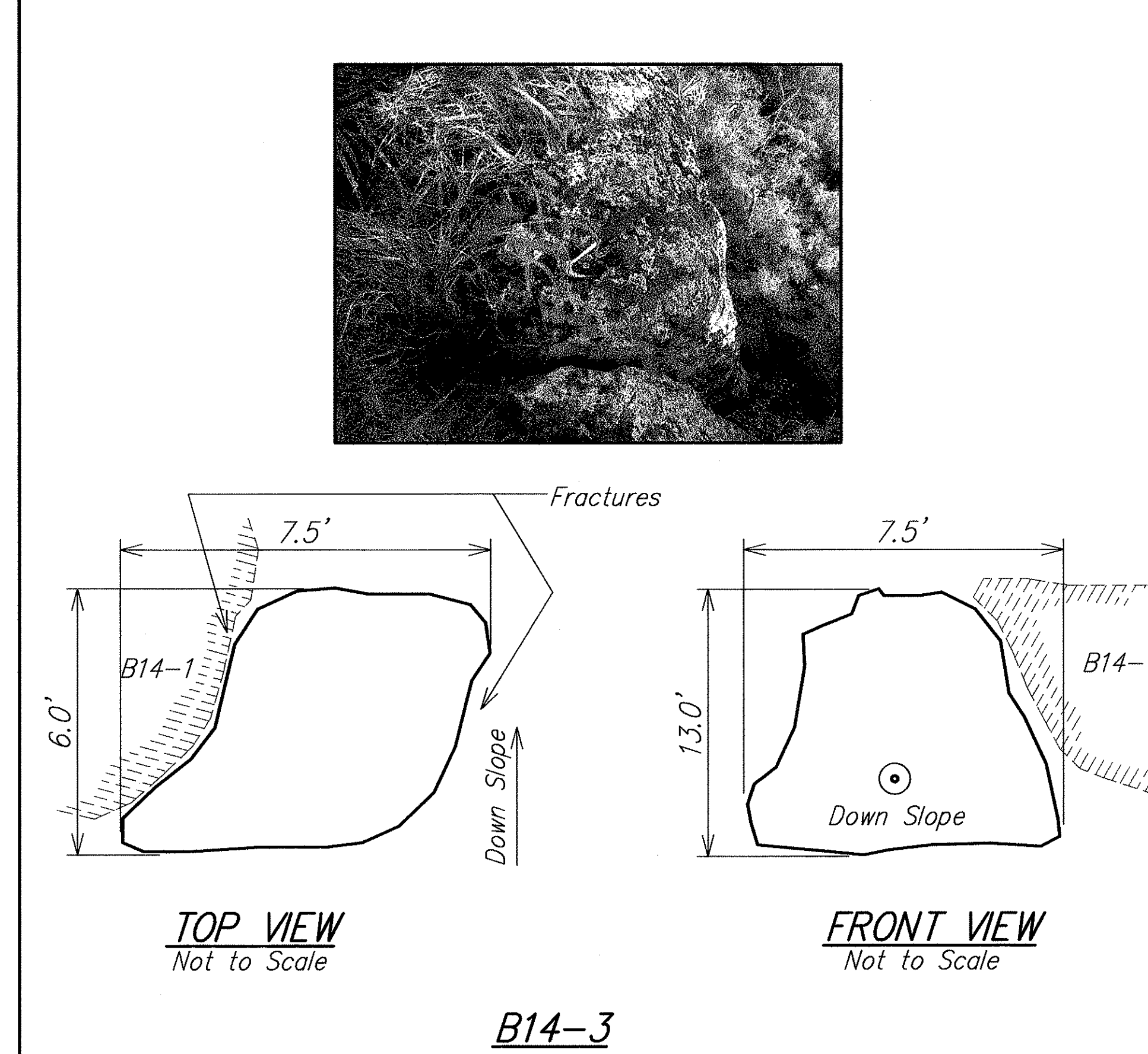
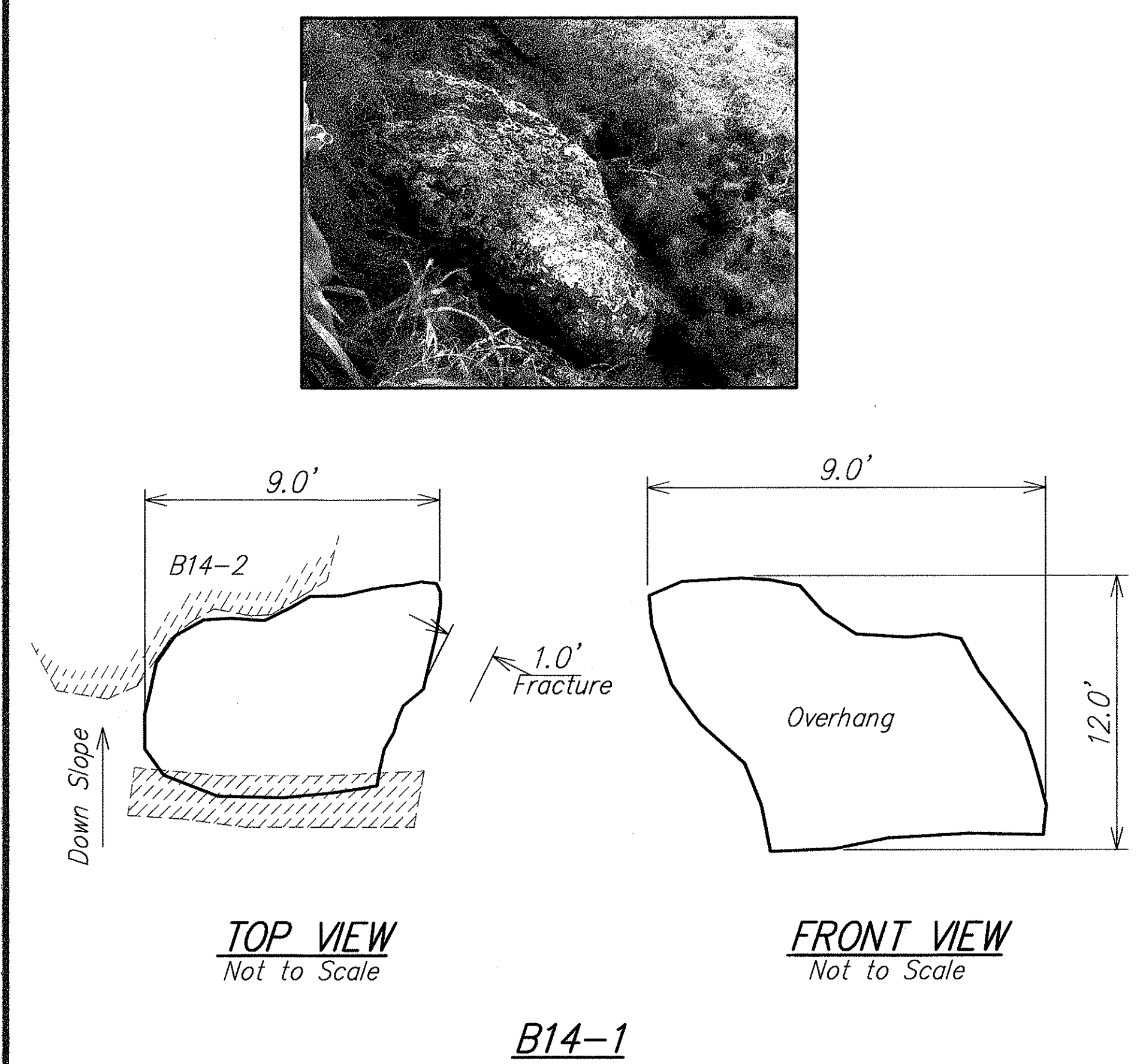
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| ORIGINAL PLAN | SURVEY PLOTTED BY | DATE |
| NOTE BOOK | DRAWN BY | " |
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| | QUANTITIES BY | " |
| | CHECKED BY | " |
| No. | | |

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| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|--------|-----------|-------------|-----------|--------------|
| OAHU | HAWAII | 61D-02-06 | 2006 | 26 | 57 |



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KRYLAN R. NIKU
LICENSED PROFESSIONAL ENGINEER
No. 6198-C
HAWAII

EXPIRATION DATE OF THE LICENSE 4/30/2008
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STATE OF HAWAII
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HIGHWAYS DIVISION

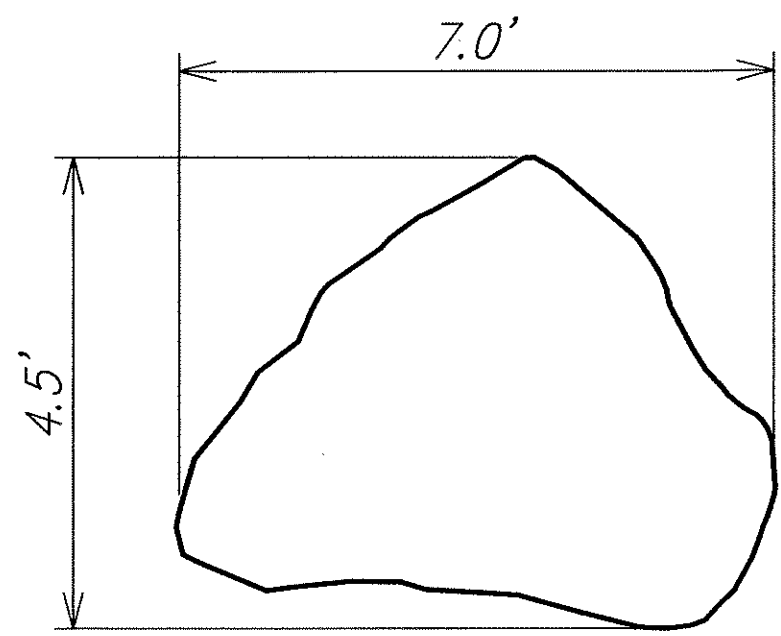
BOULDER DETAILS
B14 THRU B18
KAILUA ROAD PERMANENT
ROCKFALL AND LANDSLIDE MITIGATION
PROJECT NO. 61D-02-06

Scale: As Noted Date: Aug 2006

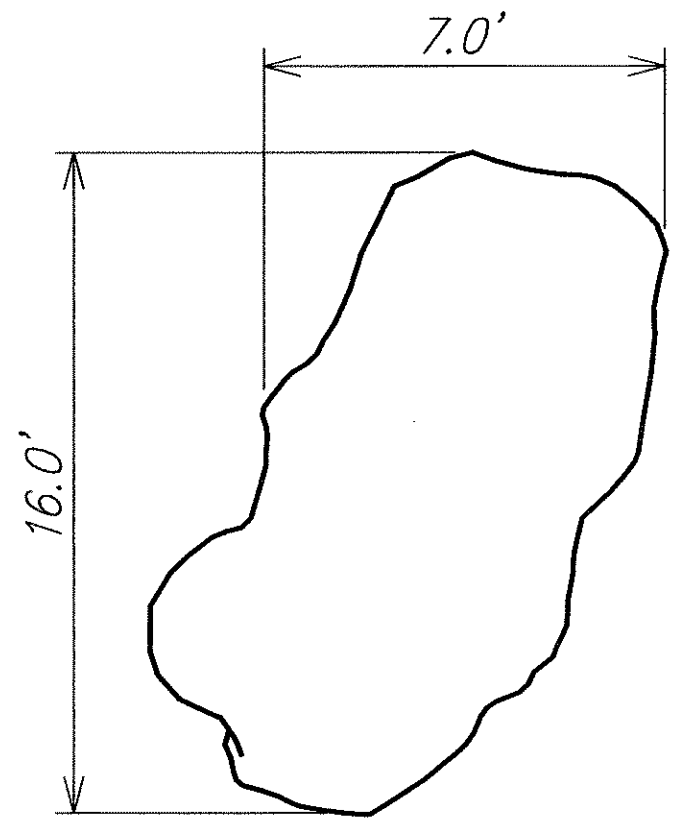
SHEET No. 4 OF 6 SHEETS

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| CHECKED BY | |
| ORIGINAL PLAN | |
| NOTE BOOK | |
| No. | |

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
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| OAHU | HAWAII | 61D-02-06 | 2006 | ADD.28 | 57 |

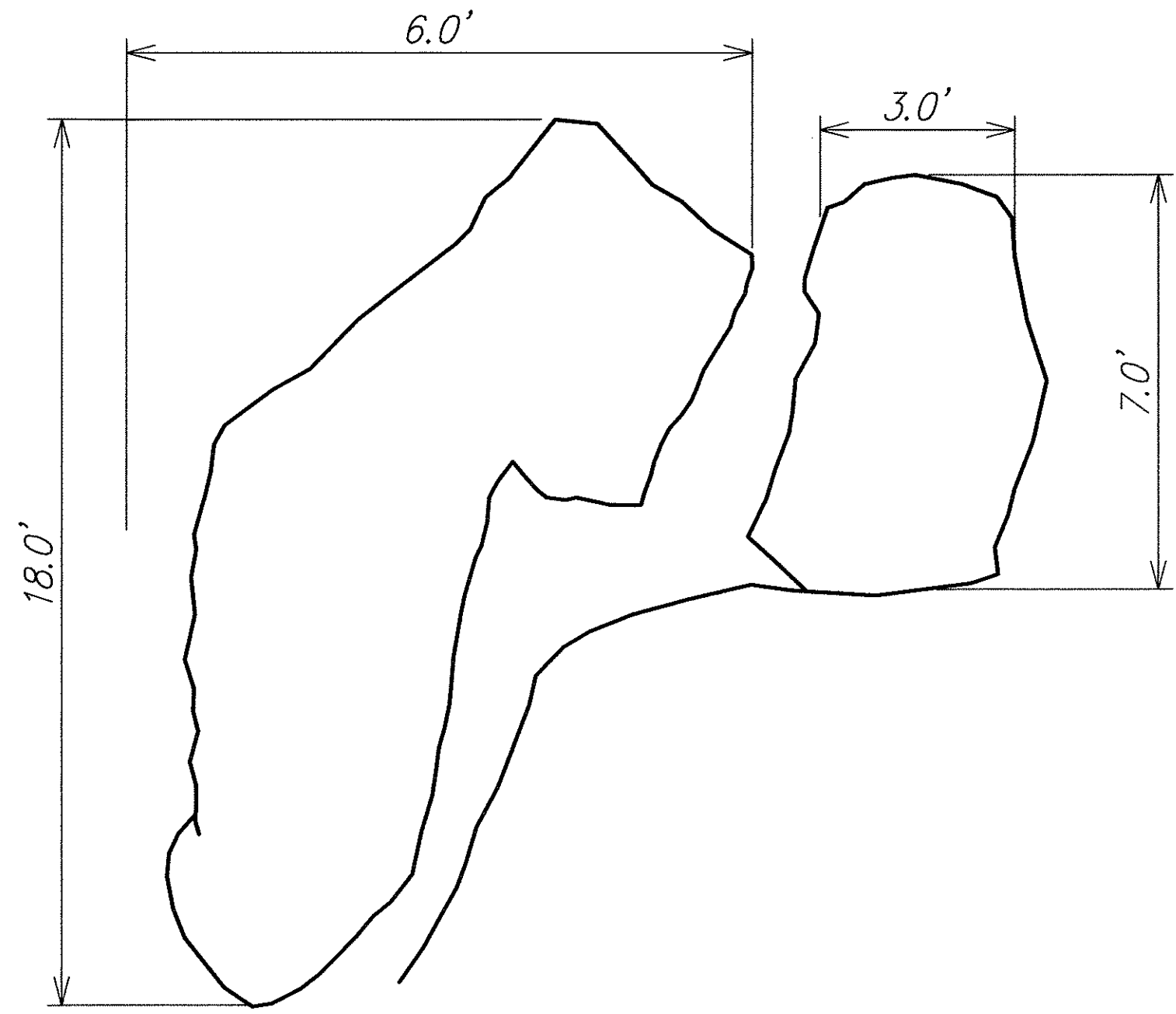
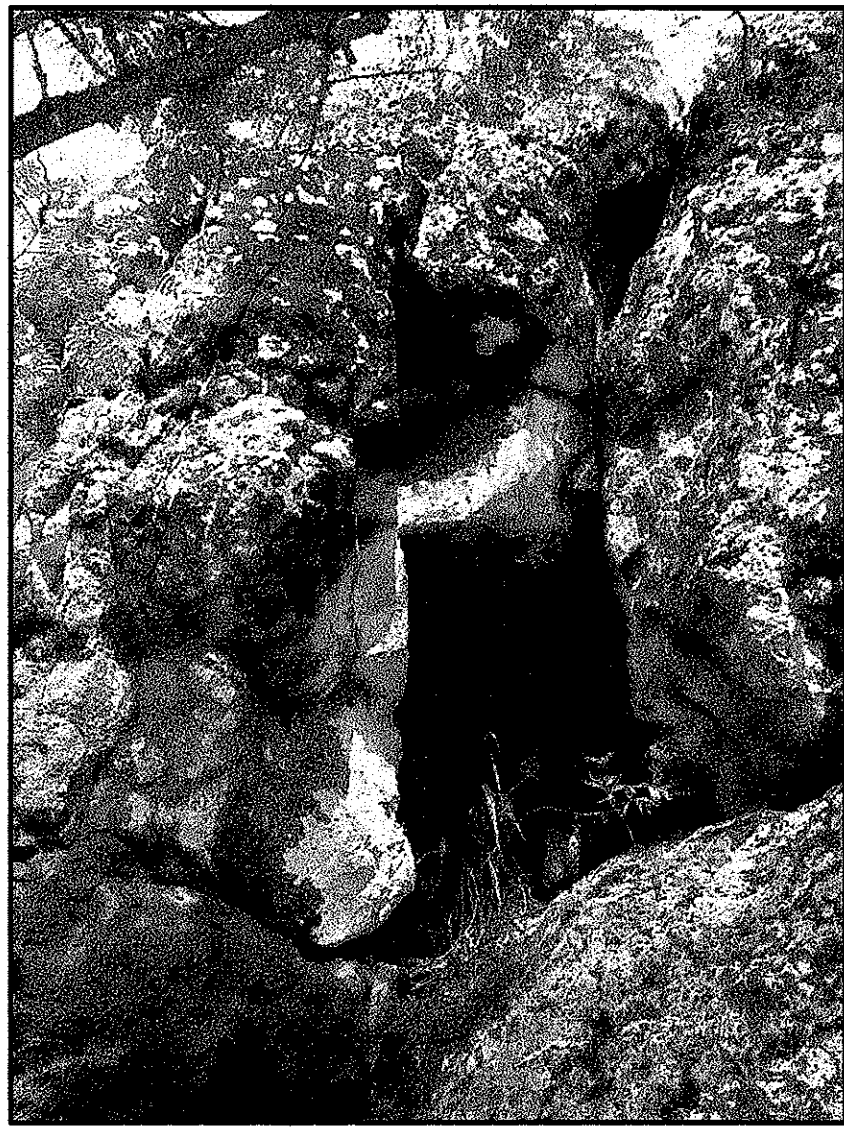


TOP VIEW
Not to Scale

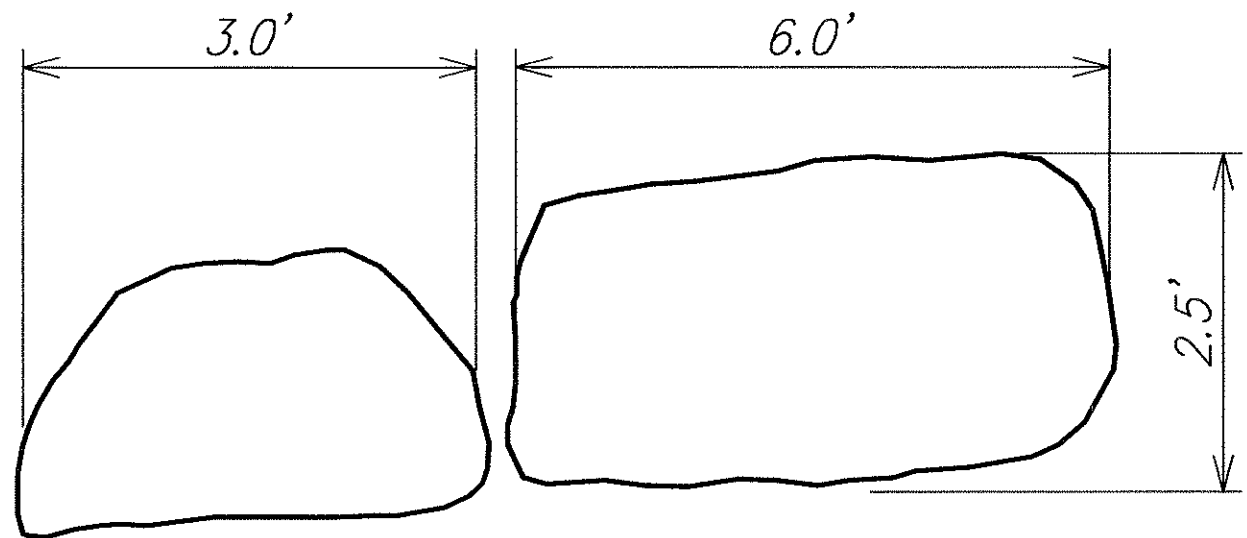


FRONT VIEW
Not to Scale

B39

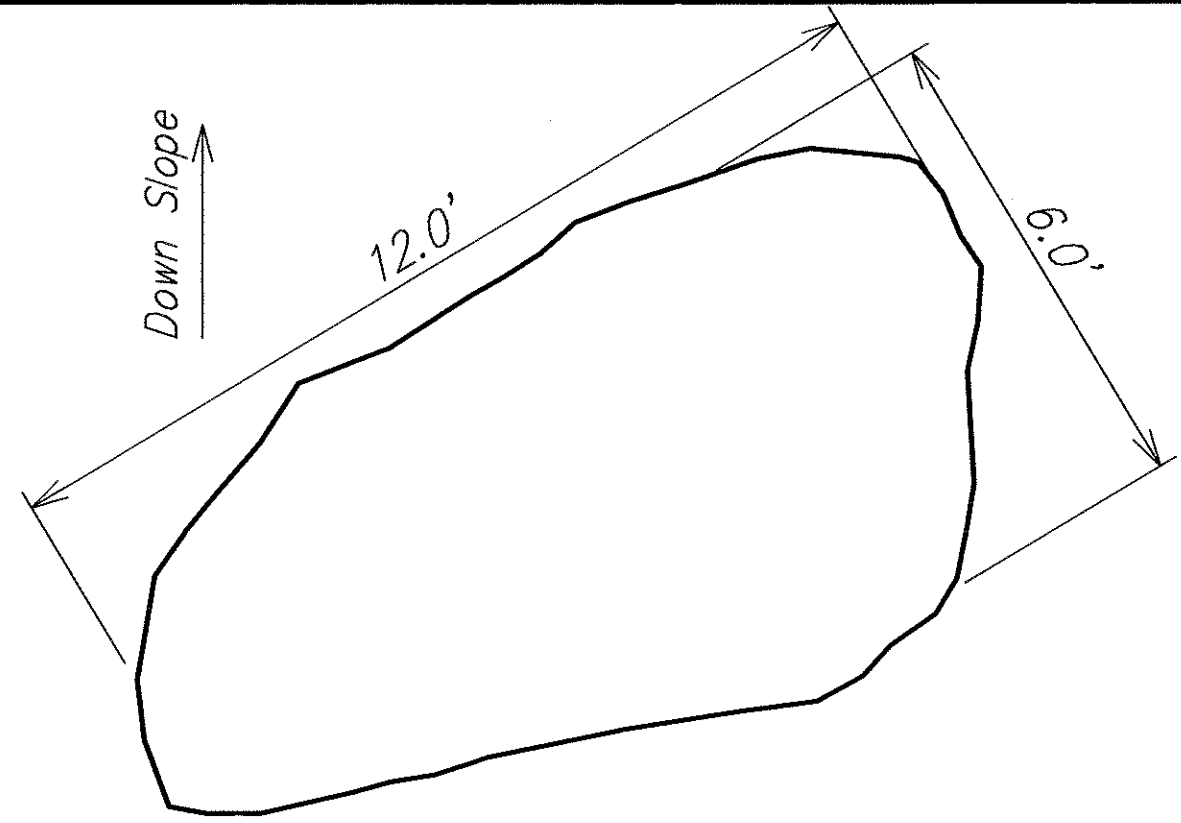


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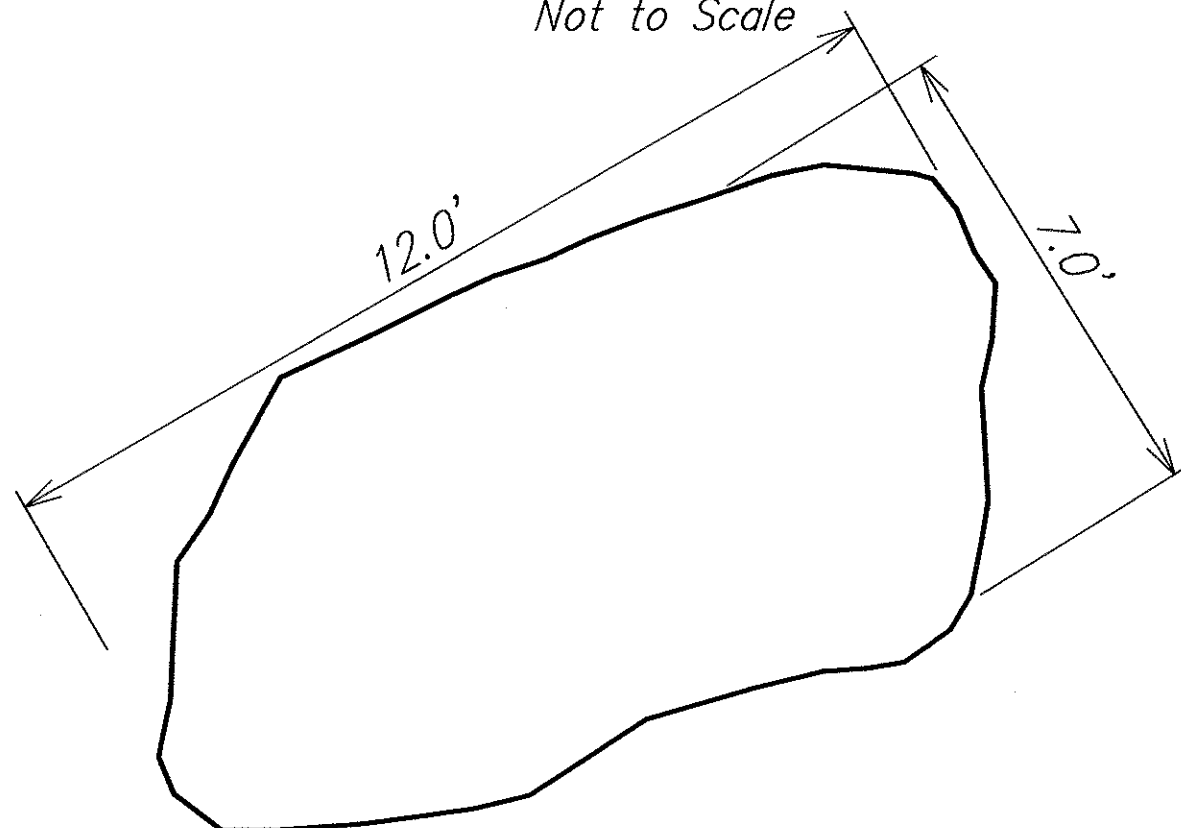


TOP VIEW
Not to Scale

B61

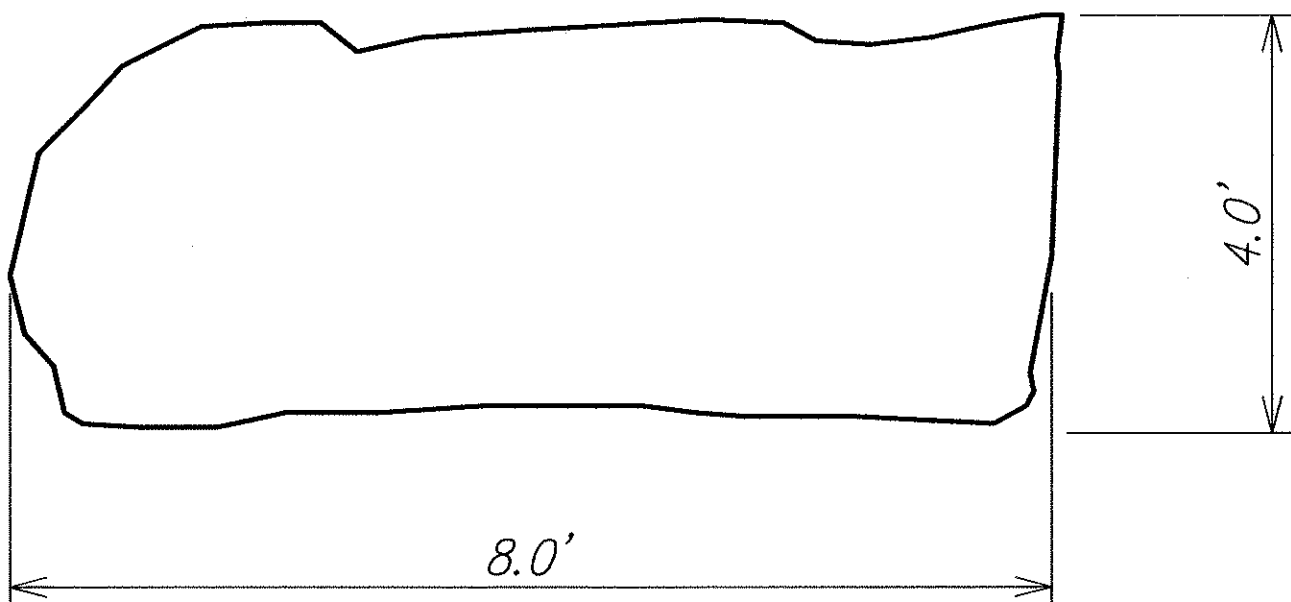
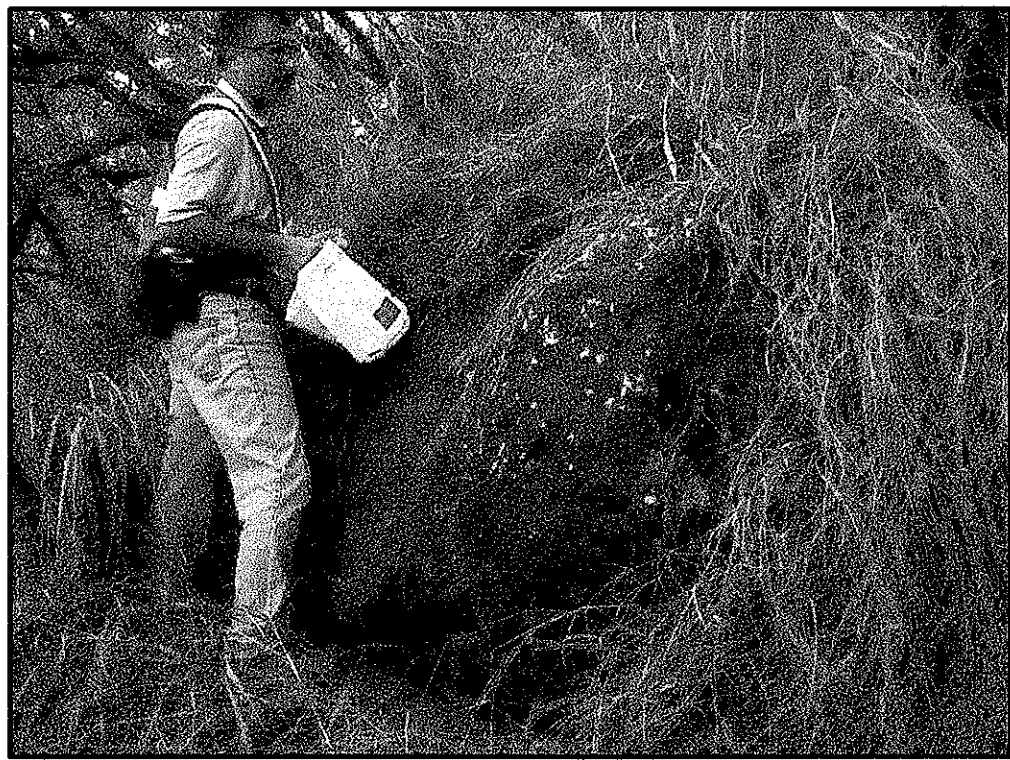


TOP VIEW
Not to Scale



FRONT VIEW
Not to Scale

B70-1



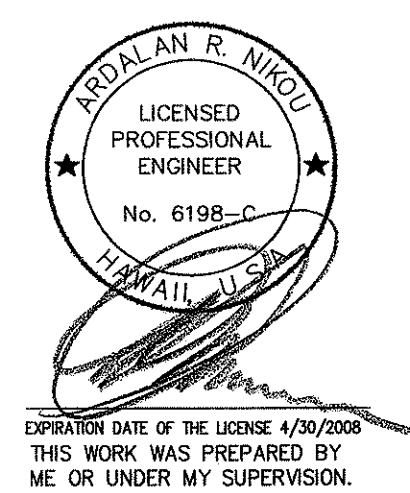
PLAN VIEW
Not to Scale

B70-2

| | |
|---------|---------------------------------|
| 9/11/06 | Added details for B70-1 & B70-2 |
|---------|---------------------------------|

| | |
|------|----------|
| Date | Revision |
|------|----------|

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| STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION | |
| <u>BOULDER DETAILS</u> <u>B39 THRU B70-2</u> <u>KAILUA ROAD PERMANENT</u> <u>ROCKFALL AND LANDSLIDE MITIGATION</u> <u>PROJECT NO. 61D-02-06</u> | |
| Scale: As Noted | Date: Aug 2006 |
| SHEET No. 6 OF 6 SHEETS | |

ADD. 28

| | | |
|-----------|-------------------|------|
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| PLAN | DRAWN BY | " |
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| No. | QUANTITIES BY | " |
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