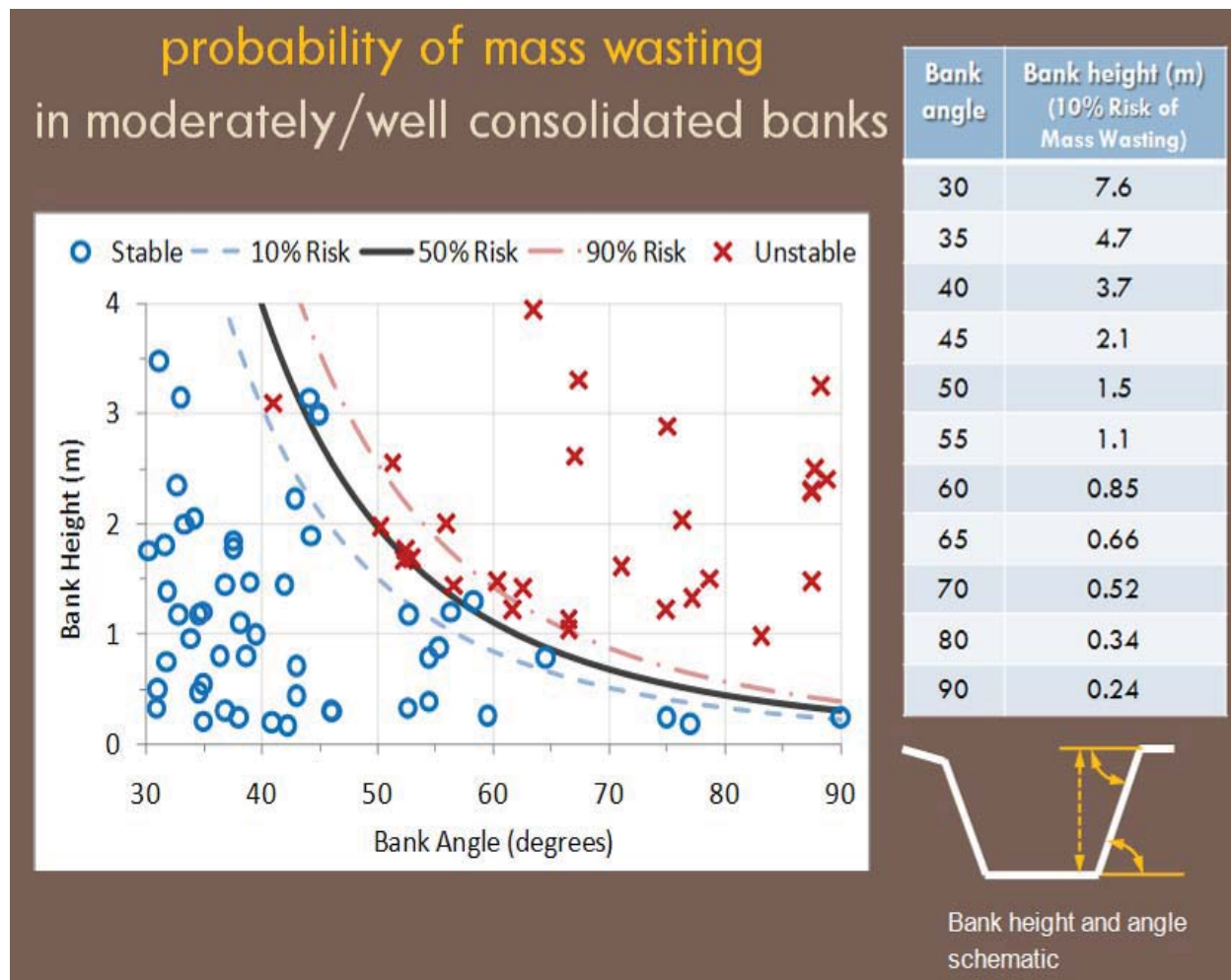# FORM 6: PROBABILITY OF MASS WASTING BANK FAILURE

If mass wasting is not currently extensive and the banks are moderately- to well-consolidated, measure bank height and angle at several locations (i.e., at least three locations that capture the range of conditions present in the study reach) to estimate representative values for the reach. Use Form 6 Figure 1 below to determine if risk of bank failure is >10% and complete Form 6 Table 1. Support your results with photographs that include a protractor/rod/tape/person for scale.

	Bank Angle (degrees) *(from Field)*	Bank Height (m) *(from Field)*	Corresponding Bank Height for 10% Risk of Mass Wasting (m) *(from Form 6 Figure 1 below)*	Bank Failure Risk *(<10% Risk)* *(>10% Risk)*
Left Bank	<33.7 (1.5:1)	---	---	<10%
Right Bank	<33.7 (1.5:1)	---	---	<10%

Form 6 Figure 1. Probability Mass Wasting diagram, Bank Angle:Height/% Risk table, and Band Height:Angle schematic.

(Sheet 1 of 1)

REACH 1 THROUGH 4 RESULTS

Critical Flow Calculator

Reach 1

enter all values in green cells
and drop down boxes

Inputs

a) Receiving channel width at top of bank (ft) - see figure on right **19.0**

b) Channel width at bed (ft) **4.0**

c) Bank height at top of bank (ft) **5.0**

Channel gradient (ft/ft) **0.1047**

Receiving channel roughness

Same as above with more stones n=0.05 ▼

Channel materials (use weakest of bed or banks). If materials are varied use weakest material covering more than 20% of channel.

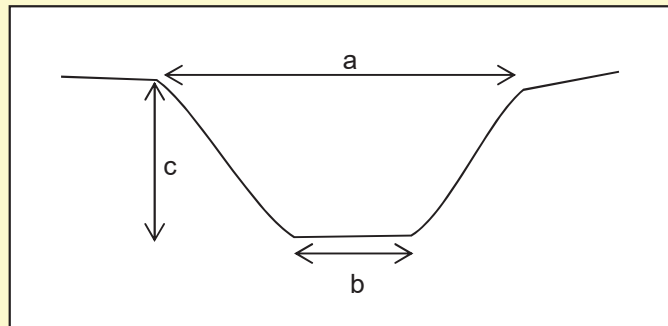| unconsolidated sandy loam 0.035 lb/sq ft |
| --- |
| alluvial silt (non coloidal) 0.045 lb/sq ft |
| medium gravel 0.12 lb/sq ft |
| alluvial silt/clay 0.26 lb/sq ft |
| 2.5 inch cobble 1.1 lb/sq ft |
| enter own d50 (variable) |
| vegetation (bed and banks) 0.6 lb/sq ft |

Select method of calculating Q2

Input own Q2
Calculate Q2 using USGS regression

Receiving water watershed annual precip (inches) **14.6**

Receiving water watershed area at PoC (sq mi) **0.1187**

Project watershed annual precipitation (inches) **14.6**

Project watershed area draining to PoC (sq mi) **0.1187**

Outputs - Flow control range

Receiving water Q2	2.3	Point of Compliance low flow rate (cfs)	1.2
Project site Q2	2.3	Low flow class	0.5Q2
		Channel vulnerability	Low

Critical Flow Calculator

Reach 2

enter all values in green cells
and drop down boxes

Inputs

a) Receiving channel width at top of bank (ft) - see figure on right | 25.0

b) Channel width at bed (ft) | 5.0

c) Bank height at top of bank (ft) | 5.0

Channel gradient (ft/ft) | 0.1250

Receiving channel roughness

Very weedy, or dense timber and underbrush n= 0.10 ▼

Channel materials (use weakest of bed or banks). If materials are varied use weakest material covering more than 20% of channel.

unconsolidated sandy loam 0.035 lb/sq ft
alluvial silt (non coloidal) 0.045 lb/sq ft
medium gravel 0.12 lb/sq ft
alluvial silt/clay 0.26 lb/sq ft
2.5 inch cobble 1.1 lb/sq ft
enter own d50 (variable)
vegetation (bed and banks) 0.6 lb/sq ft

Select method of calculating Q2

Input own Q2
Calculate Q2 using USGS regression

Receiving water watershed annual precip (inches) | 14.6

Receiving water watershed area at PoC (sq mi) | 0.0446

Project watershed annual precipitation (inches) | 14.6

Project watershed area draining to PoC (sq mi) | 0.0446

Outputs - Flow control range

Receiving water Q2 | 1.1

Project site Q2 | 1.1
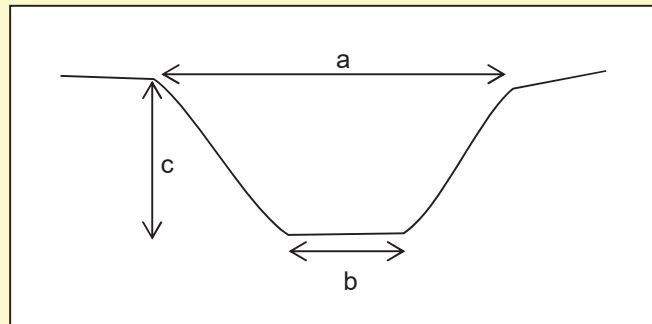
Point of Compliance low flow rate (cfs) | 0.6

Low flow class | 0.5Q2

Channel vulnerability | Low

Critical Flow Calculator

Reach 3

enter all values in green cells
and drop down boxes

Inputs

a) Receiving channel width at top of bank (ft) - see figure on right | 30.0

b) Channel width at bed (ft) | 10.0

c) Bank height at top of bank (ft) | 5.0

Channel gradient (ft/ft) | 0.3604

Receiving channel roughness

Very weedy, or dense timber and underbrush n= 0.10 ▼

Channel materials (use weakest of bed or banks). If materials are varied use weakest material covering more than 20% of channel.

unconsolidated sandy loam 0.035 lb/sq ft
alluvial silt (non coloidal) 0.045 lb/sq ft
medium gravel 0.12 lb/sq ft
alluvial silt/clay 0.26 lb/sq ft
2.5 inch cobble 1.1 lb/sq ft
enter own d50 (variable)
vegetation (bed and banks) 0.6 lb/sq ft

Select method of calculating Q2

Input own Q2
Calculate Q2 using USGS regression

Receiving water watershed annual precip (inches) | 14.6

Receiving water watershed area at PoC (sq mi) | 0.0213

Project watershed annual precipitation (inches) | 14.6

Project watershed area draining to PoC (sq mi) | 0.0213

Outputs - Flow control range

Receiving water Q2 | 0.7

Project site Q2 | 0.7
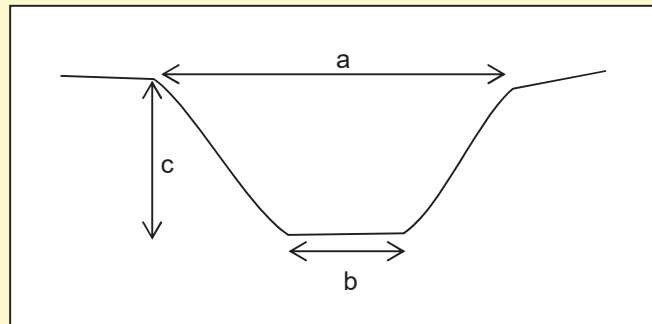
Point of Compliance low flow rate (cfs) | **0.3**

Low flow class | 0.5Q2

Channel vulnerability | Low

Critical Flow Calculator   Reach 4

enter all values in green cells
and drop down boxes

Inputs

a) Receiving channel width at top of bank (ft) - see figure on right | 28.0

b) Channel width at bed (ft) | 8.0

c) Bank height at top of bank (ft) | 5.0

Channel gradient (ft/ft) | 0.0584

Receiving channel roughness

Light brush and trees, leaves not present n=0.06 ▼

Channel materials (use weakest of bed or banks). If materials are varied use weakest material covering more than 20% of channel.

unconsolidated sandy loam 0.035 lb/sq ft
alluvial silt (non coloidal) 0.045 lb/sq ft
medium gravel 0.12 lb/sq ft
alluvial silt/clay 0.26 lb/sq ft
2.5 inch cobble 1.1 lb/sq ft
enter own d50 (variable)
vegetation (bed and banks) 0.6 lb/sq ft

Select method of calculating Q2

Input own Q2
Calculate Q2 using USGS regression

Receiving water watershed annual precip (inches) | 14.6

Project watershed annual precipitation (inches) | 14.6

Receiving water watershed area at PoC (sq mi) | 0.2376

Project watershed area draining to PoC (sq mi) | 0.2376

Outputs - Flow control range

Receiving water Q2 | 3.8

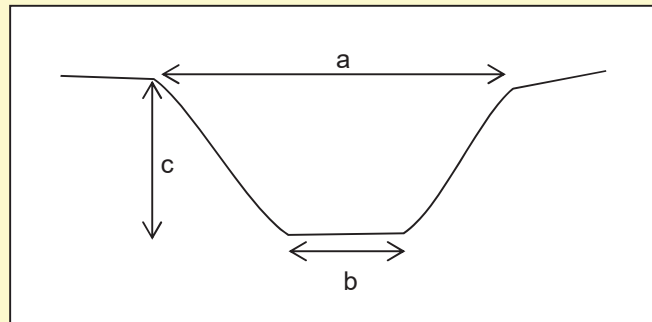Project site Q2 | 3.8

Point of Compliance low flow rate (cfs) | 1.9
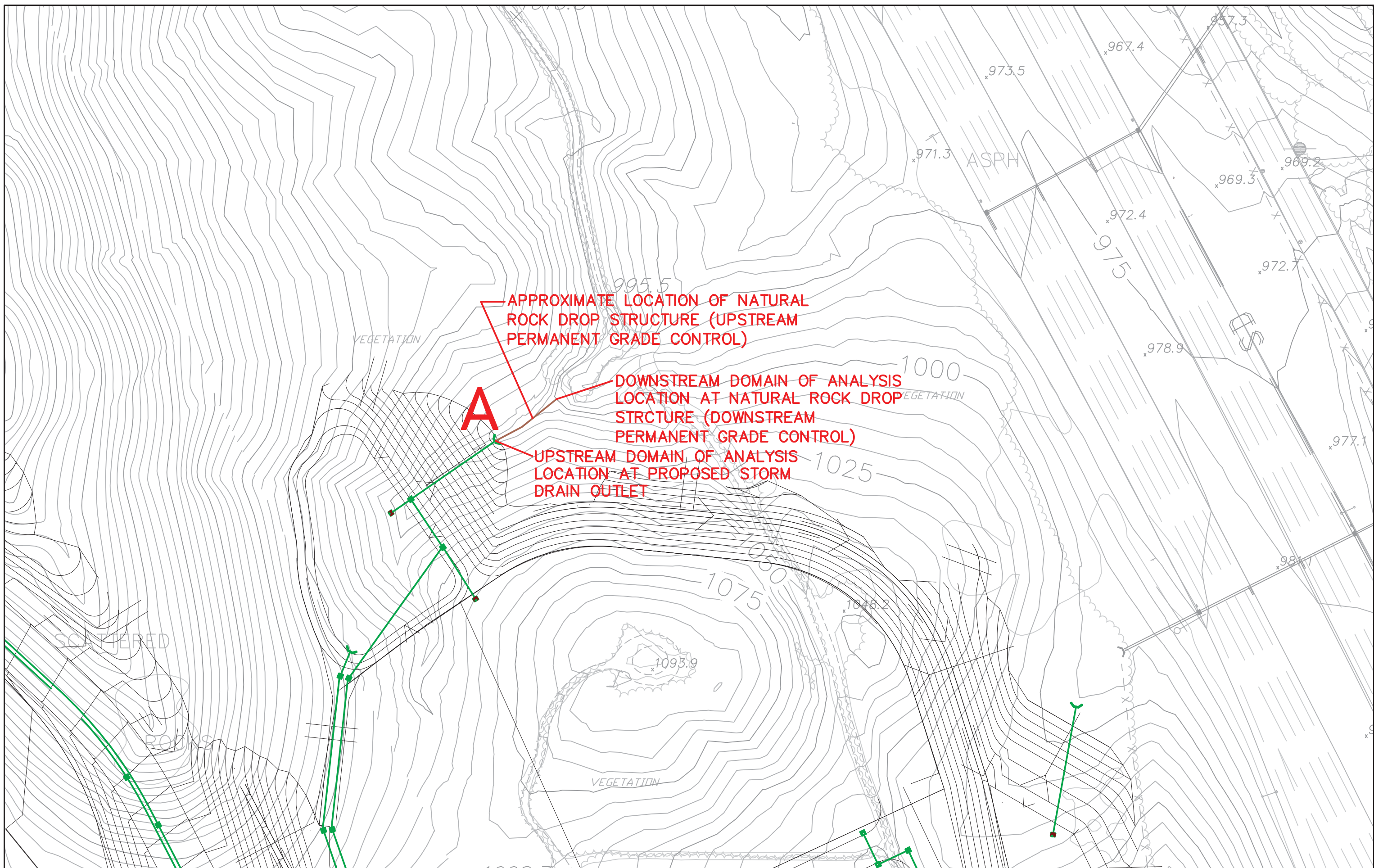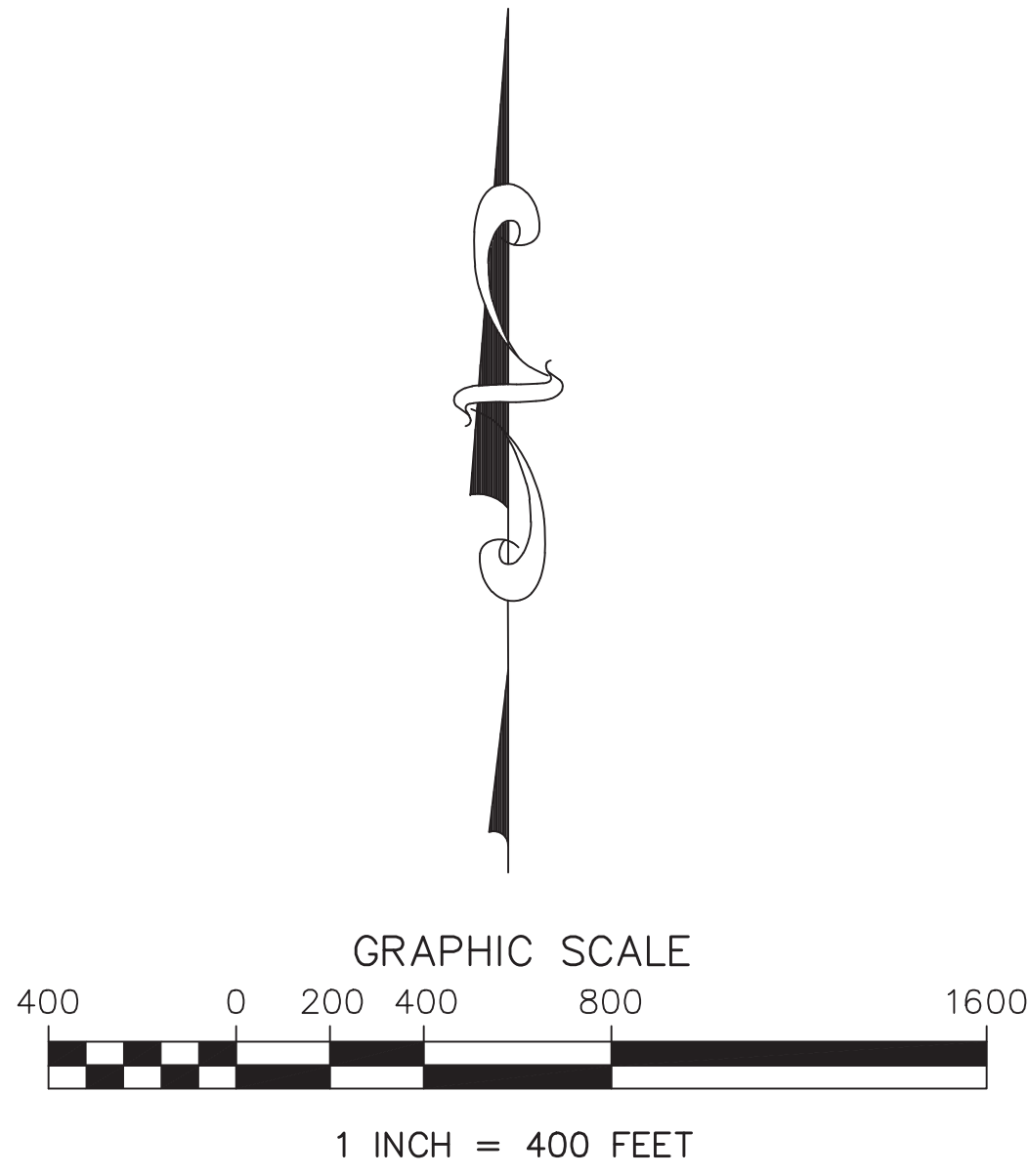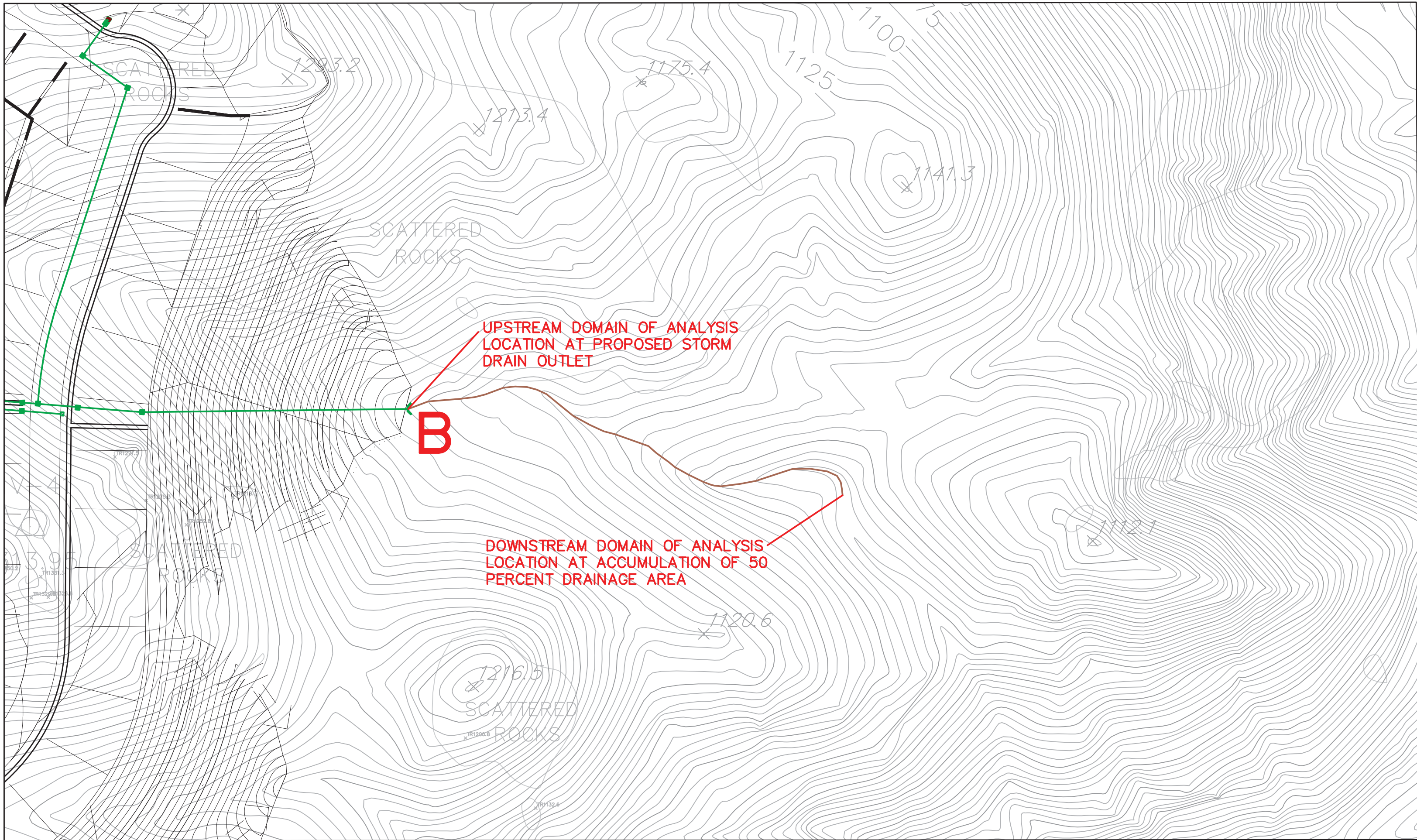
Low flow class | 0.5Q2

Channel vulnerability | Low

NEWLAND SIERRA
STUDY AREA EXHIBIT

DETAIL — REACH 1
SCALE 1"=100'

APPROXIMATE LOCATION OF NATURAL ROCK DROP STRUCTURE (UPSTREAM PERMANENT GRADE CONTROL)

DOWNSTREAM DOMAIN OF ANALYSIS LOCATION AT NATURAL ROCK DROP STRUCTURE (DOWNSTREAM PERMANENT GRADE CONTROL)

UPSTREAM DOMAIN OF ANALYSIS LOCATION AT PROPOSED STORM DRAIN OUTLET

A

DETAIL — REACH 2
SCALE 1"=100'

UPSTREAM DOMAIN OF ANALYSIS LOCATION AT PROPOSED STORM DRAIN OUTLET

B

DOWNSTREAM DOMAIN OF ANALYSIS LOCATION AT ACCUMULATION OF 50 PERCENT DRAINAGE AREA
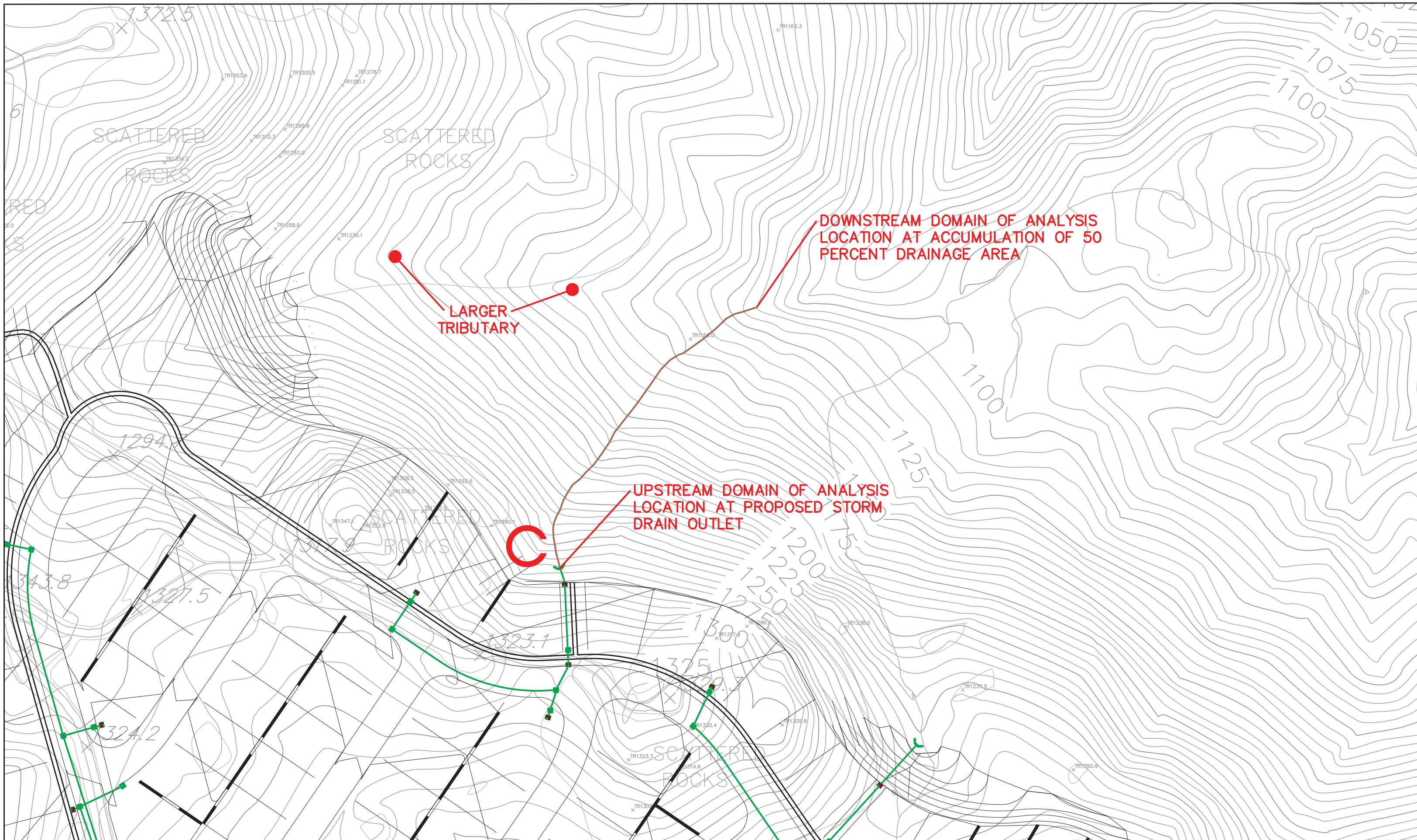
DETAIL — REACH 3
SCALE 1"=100'

DOWNSTREAM DOMAIN OF ANALYSIS LOCATION AT ACCUMULATION OF 50 PERCENT DRAINAGE AREA

LARGER TRIBUTARY

C

UPSTREAM DOMAIN OF ANALYSIS LOCATION AT PROPOSED STORM DRAIN OUTLET

DETAIL — REACH 4
SCALE 1"=100'

APPROXIMATE LOCATION OF NATURAL ROCK/BOULDER OUTCROP (UPSTREAM PERMANENT GRADE CONTROL)
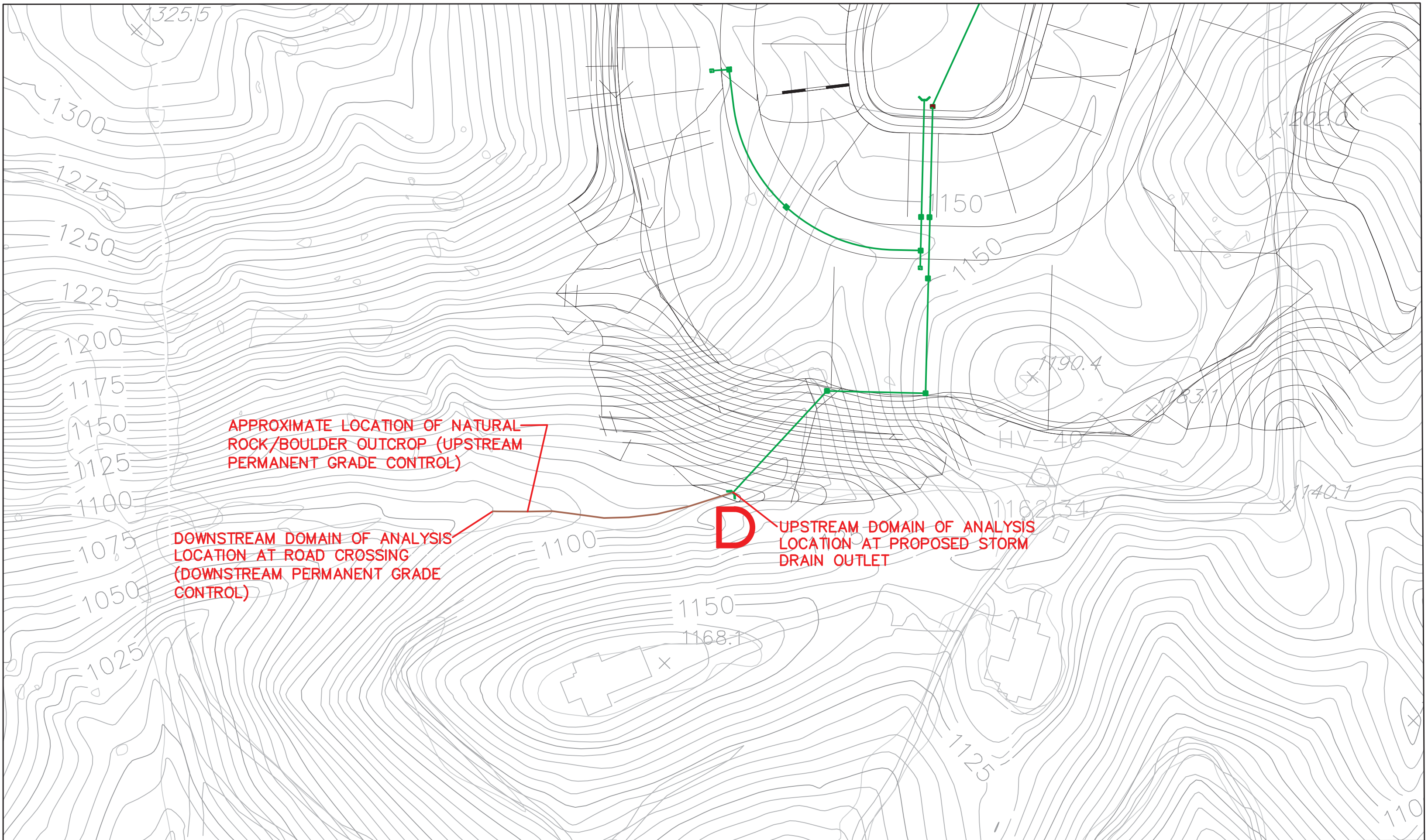
DOWNSTREAM DOMAIN OF ANALYSIS LOCATION AT ROAD CROSSING (DOWNSTREAM PERMANENT GRADE CONTROL)

D

UPSTREAM DOMAIN OF ANALYSIS LOCATION AT PROPOSED STORM DRAIN OUTLET

PLAN — STUDY AREA AND DRAINAGE BASINS
SCALE 1"=400'

INTERSTATE 15

19.04 AC
B R2
9.52 AC

8.70 AC
R3
4.96 AC

138.00 AC

14.07 AC

R4 D

2.09 AC
R1
A

73.90 AC

GRAPHIC SCALE
400 0 200 400 800 1600
1 INCH = 400 FEET

LEGEND:

———————— PROPERTY BOUNDARY
— — — — PROPOSED GRADING
———————— PROPOSED STORM DRAIN
R2 ———— STUDY REACH (OVERLAND NATURAL FLOW PATH)
———————— DRAINAGE BASIN BOUNDARY
123.04 AC DRAINAGE BASIN AREA
A POINT OF COMPLIANCE FROM CURRENT CHANNEL ASSESSMENT REPORT

CURRENT REPORT POINT OF COMPLIANCE	ASSOCIATED FUSCOE POINT OF COMPLIANCE
A	19
B	13B
C	13B
D	26