Class Exercise

- Soil Stabilization
- Sediment Controls
- Verify the contractors calculations for the quantity of material need to stabilize a Disturbed Soil Area (DSA)

Soil Stabilization and Sediment Controls Calculations

- Soil stabilization
  - Estimating the amount of soil stabilization material need to protect disturbed soil areas
- Sediment control
  - Estimating the amount of sediment control material need to protect disturbed soil areas
- Breaking up slope length
  - Estimating the amount of fiber rolls or gravel bag berms needed to break-up slope lengths

Soil Stabilization Calculations

- Use Table 2-2 to determine which slopes require stabilization

Table 2-2

REQUIRED COMBINATION OF TEMPORARY SOIL STABILIZATION AND TEMPORARY SEDIMENT CONTROLS AND BARRIERS [6] [7]

NON-ACTIVE DISTURBED SOIL AREAS

SEASON	AREA(S)	TEMPORARY BMP	SLOPE (V:H) [1]			
			≤ 1:20	> 1:20 ≤ 1:4	> 1:4 ≤ 1:2	> 1:2
RAINY[2]	1 & 6	SOIL STABILIZATION [5]	X	X	X	X
		SEDIMENT BARRIER [5]	X	X	X	X
		DESILTING BASIN [3]		X	X	X
	2, 3, 4 & 5	SOIL STABILIZATION [5]	X	X	X	X
		SEDIMENT BARRIER		X	X	X
		DESILTING BASIN				
	7	SOIL STABILIZATION AND SEDIMENT CONTROL PRACTICES TO BE DETERMINED BY APPLICABLE RWQCB[5]				
NON-RAINY	1	SOIL STABILIZATION [5]	X[4]	X[4]	X	X
		SEDIMENT BARRIER		X[4]	X	X
		DESILTING BASIN				
	2 & 4	SOIL STABILIZATION				
		SEDIMENT BARRIER				
		DESILTING BASIN				
	3 & 5	SOIL STABILIZATION				
		SEDIMENT BARRIER				X[4]
		DESILTING BASIN				
	6	SOIL STABILIZATION [5]	X[4]	X[4]	X	X
		SEDIMENT BARRIER		X[4]	X	X
		DESILTING BASIN [3]				X
	7	SOIL STABILIZATION AND SEDIMENT CONTROL PRACTICES TO BE DETERMINED BY APPLICABLE RWQCB[5]				

(1) Unless otherwise noted, the temporary BMP is required for the slope inclinations indicated on slope lengths greater than 3 meters.

(2) The maximum slope length is 30 meters for slope inclinations between 1:20 (V:H) and 1:2 (V:H) and 15 meters for steeper slopes.

(3) Required in addition to the temporary sediment barrier, where feasible. Feasibility will depend on site-specific factors such as available right-of-way within the project limits, topography, soil type, disturbed soil area within watershed, and climate conditions.

(4) Implementation of controls not required except at least 24 hours prior to all predicted rain events.

(5) The indicated temporary BMP is required on all slope lengths.

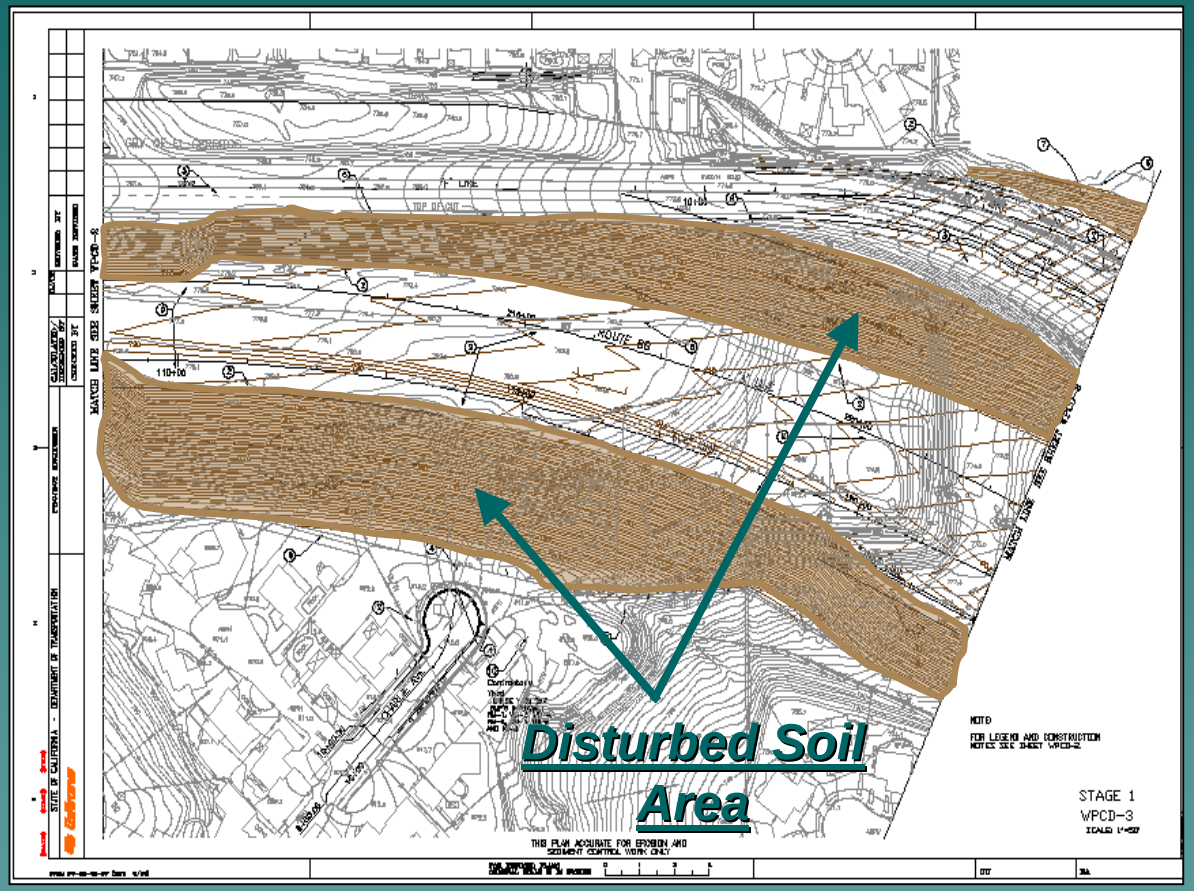
(6) Sediment controls and barriers include all temporary sediment control construction BMPs identified in the Statewide Storm Water Quality Practice Guidelines associated with the SWMP and Section 4 of these guidelines. Linear barrier systems are equivalent to what are referred to in the General Construction Permit as perimeter controls. The intent is prevent the transport of sediment at the downslope edge of disturbed soil areas.

(7) Permanent erosion control seeding shall be applied to all non-active areas deemed substantially complete during the project's defined seeding window.

(8) Refer to Section 2.2.6 for procedure.

Soil Stabilization Calculations

- Calculate the total DSA that will require soil stabilization



Sediment Control Calculations

- Use Table 2-2 to determine which slopes require linear barriers

Table 2-2

REQUIRED COMBINATION OF TEMPORARY SOIL STABILIZATION AND TEMPORARY SEDIMENT CONTROLS AND BARRIERS [6] [7]

NON-ACTIVE DISTURBED SOIL AREAS

SEASON	AREA(S)	TEMPORARY BMP	SLOPE (V:H) [1]			
			≤ 1:20	> 1:20 ≤ 1:4	> 1:4 ≤ 1:2	> 1:2
RAINY[2]	1 & 6	SOIL STABILIZATION [5]	X	X	X	X
		SEDIMENT BARRIER [5]	X	X	X	X
		DESILTING BASIN [3]		X	X	X
	2, 3, 4 & 5	SOIL STABILIZATION [5]	X	X	X	X
		SEDIMENT BARRIER		X	X	X
		DESILTING BASIN				
	7	SOIL STABILIZATION AND SEDIMENT CONTROL PRACTICES TO BE DETERMINED BY APPLICABLE RWQCB[5]				
NON-RAINY	1	SOIL STABILIZATION [5]	X[4]	X[4]	X	X
		SEDIMENT BARRIER		X[4]	X	X
		DESILTING BASIN				
	2 & 4	SOIL STABILIZATION				
		SEDIMENT BARRIER				
		DESILTING BASIN				
	3 & 5	SOIL STABILIZATION				
		SEDIMENT BARRIER				X[4]
		DESILTING BASIN				
	6	SOIL STABILIZATION [5]	X[4]	X[4]	X	X
		SEDIMENT BARRIER		X[4]	X	X
		DESILTING BASIN [3]				X
	7	SOIL STABILIZATION AND SEDIMENT CONTROL PRACTICES TO BE DETERMINED BY APPLICABLE RWQCB[5]				

(1) Unless otherwise noted, the temporary BMP is required for the slope inclinations indicated on slope lengths greater than 3 meters.

(2) The maximum slope length is 30 meters for slope inclinations between 1:20 (V:H) and 1:2 (V:H) and 15 meters for steeper slopes.

(3) Required in addition to the temporary sediment barrier, where feasible. Feasibility will depend on site-specific factors such as available right-of-way within the project limits, topography, soil type, disturbed soil area within watershed, and climate conditions.

(4) Implementation of controls not required except at least 24 hours prior to all predicted rain events.

(5) The indicated temporary BMP is required on all slope lengths.

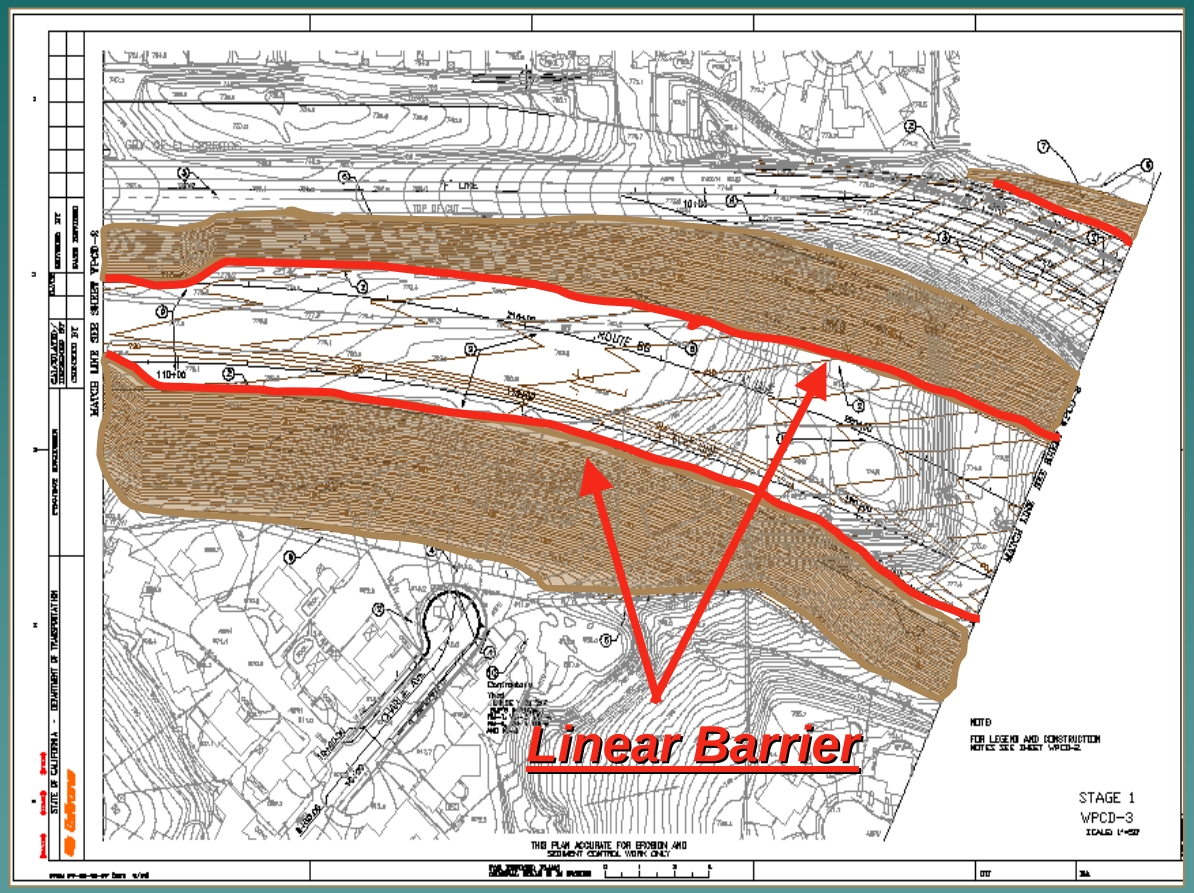
(6) Sediment controls and barriers include all temporary sediment control construction BMPs identified in the Statewide Storm Water Quality Practice Guidelines associated with the SWMP and Section 4 of these guidelines. Linear barrier systems are equivalent to what are referred to in the General Construction Permit as perimeter controls. The intent is prevent the transport of sediment at the downslope edge of disturbed soil areas.

(7) Permanent erosion control seeding shall be applied to all non-active areas deemed substantially complete during the project's defined seeding window.

(8) Refer to Section 2.2.6 for procedure.

Linear Barrier Calculations

- Calculate total length of Linear barrier needed



Slope Length

- Use Table 2-2 to determine what slopes require breaking up the length

Table 2-2

REQUIRED COMBINATION OF TEMPORARY SOIL STABILIZATION AND TEMPORARY SEDIMENT CONTROLS AND BARRIERS [6] [7]

NON-ACTIVE DISTURBED SOIL AREAS

SEASON	AREA(S)	TEMPORARY BMP	SLOPE (V:H) [1]			
			≤ 1:20	> 1:20 ≤ 1:4	> 1:4 ≤ 1:2	> 1:2
RAINY[2]	1 & 6	SOIL STABILIZATION [5]	X	X	X	X
		SEDIMENT BARRIER [5]	X	X	X	X
		DESILTING BASIN [3]		X	X	X
	2, 3, 4 & 5	SOIL STABILIZATION [5]	X	X	X	X
		SEDIMENT BARRIER		X	X	X
		DESILTING BASIN				
	7	SOIL STABILIZATION AND SEDIMENT CONTROL PRACTICES TO BE DETERMINED BY APPLICABLE RWQCB[5]				
NON-RAINY	1	SOIL STABILIZATION [5]	X[4]	X[4]	X	X
		SEDIMENT BARRIER		X[4]	X	X
		DESILTING BASIN				
	2 & 4	SOIL STABILIZATION				
		SEDIMENT BARRIER				
		DESILTING BASIN				
	3 & 5	SOIL STABILIZATION				
		SEDIMENT BARRIER				X[4]
		DESILTING BASIN				

(1) Unless otherwise noted, the temporary BMP is required for the slope inclinations indicated on slope lengths greater than 3 meters.

(2) The maximum slope length is 30 meters for slope inclinations between 1:20 (V:H) and 1:2 (V:H) and 15 meters for steeper slopes.

(3) Required in addition to the temporary sediment barrier, where feasible. Feasibility will depend on site-specific factors such as available right-of-way within the project limits, topography, soil type, disturbed soil area within watershed, and climate conditions.

(4) Implementation of controls not required except at least 24 hours prior to all predicted rain events.

(5) The indicated temporary BMP is required on all slope lengths.

(6) Sediment controls and barriers include all temporary sediment control construction BMPs identified in the Statewide Storm Water Quality Practice Guidelines associated with the SWMP and Section 4 of these guidelines. Linear barrier systems are equivalent to what are referred to in the General Construction Permit as perimeter controls. The intent is prevent the transport of sediment at the downslope edge of disturbed soil areas.

(7) Permanent erosion control seeding shall be applied to all non-active areas deemed substantially complete during the project's defined seeding window.

(8) Refer to Section 2.2.6 for procedure.

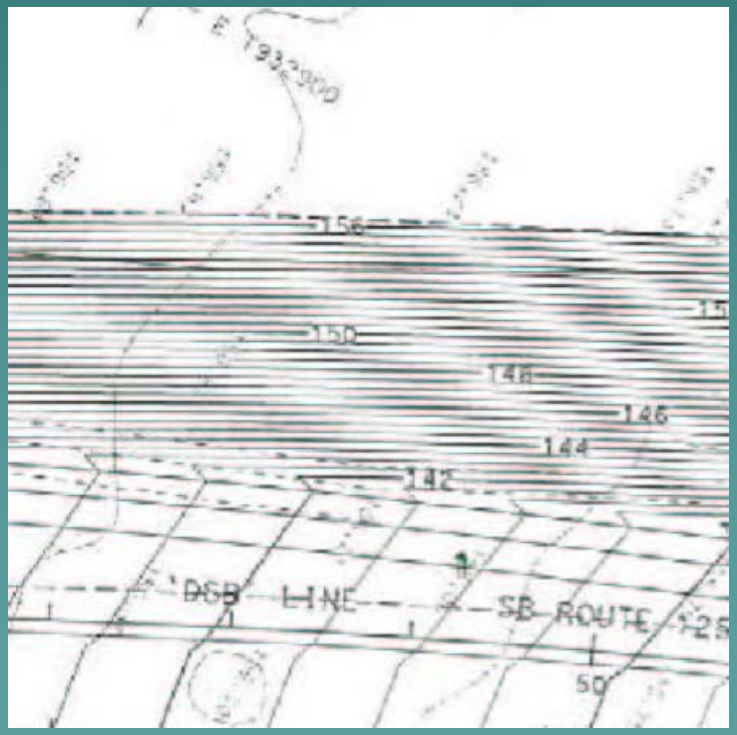
Slope Length

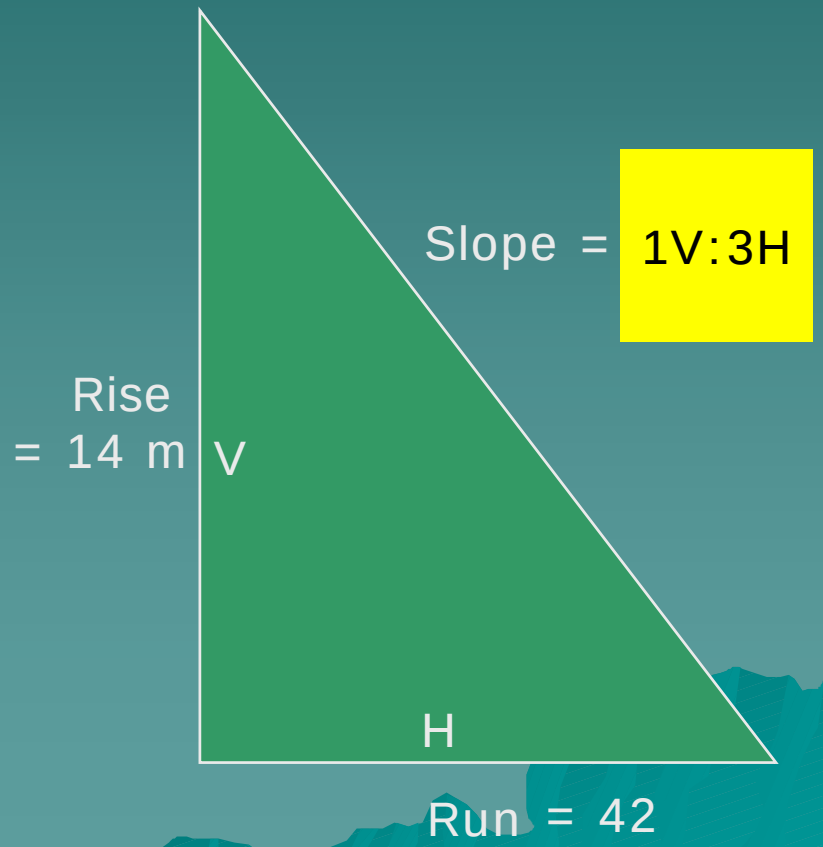
- For non-active DSAs, limit the erosive effects of storm water flow on slopes by implementing BMPs such as fiber rolls to break up the slope lengths as follows:
  - Slope inclination 1:4 (V:H) and flatter: BMPs shall be placed on slopes at intervals no greater than 6 m.
  - Slope inclination between 1:4 (V:H) and 1:2 (V:H): BMPs shall be placed on slopes at intervals no greater than 4.5 m.
  - Slope inclination 1:2 (V:H) or greater: BMPs shall be placed on slopes at intervals no greater than 3 m.

Spacing of Fiber Rolls

Slope Steepness

- Calculating Slope Steepness
  - Rise Over Run





Slope Length Calculations

- Pythagorean Theorem

  $A^2 + B^2 = C^2$

  A=42

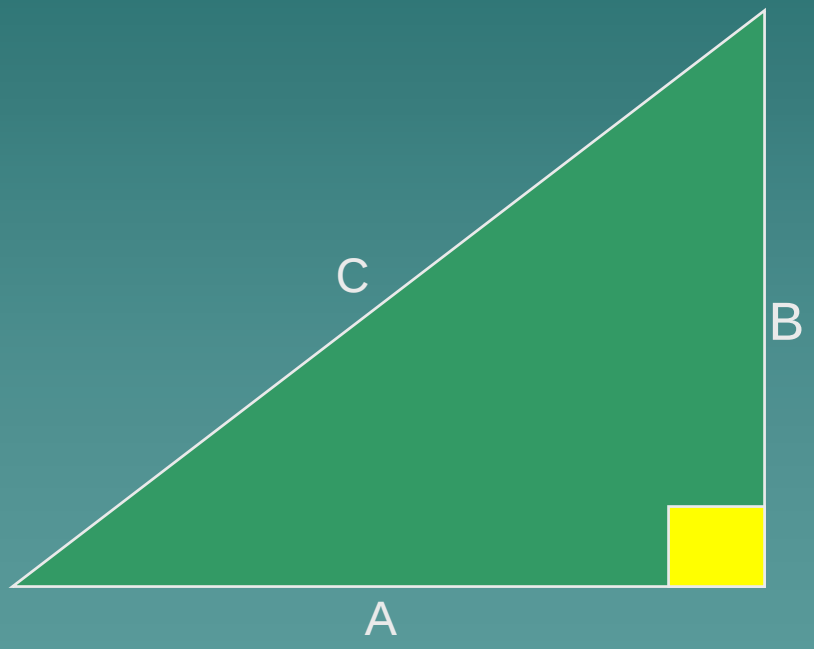
  B=14

$42^2 + 14^2 = C^2$

$1764 + 196 = C^2$

$1960 = C^2$

$44.27 = C$



Soil Stabilization Calculations

- Calculate the total DSA that will require fiber rolls

Class Exercise

- **Break in to groups of 4 to 5 people**
- **Handouts:**
  - **Plan sheet**
  - **Tables**
- **Calculate SS and SC materials**

Erosion and Sediment Control Labor Estimates

- Soil Stabilization*
  - Hydroseeding
    - 150,000 ft^2 a day (flat turf)
    - 22 bales @ 50lb a bale in a 3000 gal truck
  - Hydro Mulch (BFM)
    - 12,000 ft^2 per 3000 gal truck
    - 5 loads per day
  - Straw Mulch
    - .4 Hectare an hour
    - 1 to 2 bales a min
    - 74 lb bale covers 800 ft^2 @ 2 tons per acre

- Sediment Controls*
  - Silt Fence
    - 4 men and 5 labors
    - 1000 linear ft a day
  - Fiber Rolls
    - 4 men and 5 labors
    - 1500 linear ft a day

*Estimates are based on vendor quotes actual installation time will vary based on site location, Slope steepness, and accessibility.