

Sellwood Landslide Stabilization



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Project Description

- Landslide Mitigation Team
 - Build a model of a Landslide
 - Incorporate movement
 - Model the Bowl surrounding Sellwood Bridge

Research and Development

- The team Brainstormed
 - Came up with design
 - Created a scale
 - Researched materials
- The team created Spreadsheets
 - First, we created a materials/pricing sheet
 - Submitted to Lois
 - Then, created a Gantt Chart
 - Chart continues all the way to final project deadline (April 23, 2013)

Prototypes

- First Prototype
 - Materials
 - Five pencils
 - Two to model the slope
 - Three for movement
 - Two Styrofoam blocks
 - Styrofoam is layers moving
 - One string
 - Controls the movement



Prototypes Cnt.

- Second Prototype
 - Materials
 - Two pencils
 - One for the slope
 - One for the movement
 - Cardboard
 - Shows topography
 - Also movement over time
 - Tape
 - Keeps everything together



Prototypes Cnt.

- Final Prototype
 - Materials
 - Cardboard
 - Used to show topography
 - Staples
 - Used to push next layer
 - part of movement

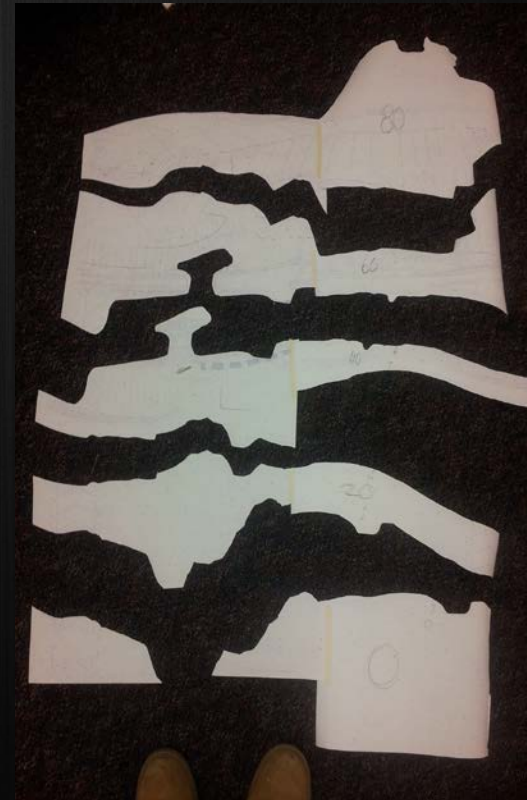


Feedback

- Landslide movement like an accordion
- Plaster makes good molding material
- Landslide is not moving at an extreme rate
- Landslide starts moving from the bottom

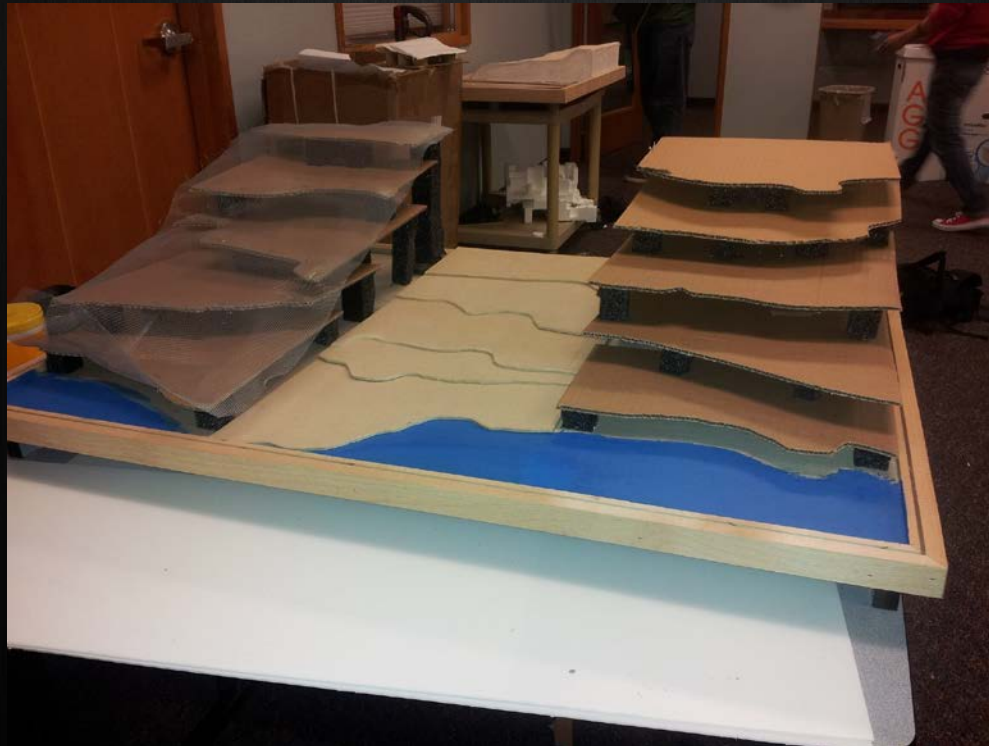
Final Design

- The team printed out topography lines.
 - Cut out lines that we needed and traced onto cardboard.



Final Design Cnt.

- The Team Made the non-movement section.
 - We used cardboard and foam.



Final Design

- Took project home to add the outer shell
 - Outer shell made of plaster cloth
 - Covered the cloth with plaster finish



Final Design

- Movement Mechanism
 - Made movement section out of wood.
 - less friction
 - Strings attached to sticks in back.
 - String controls distance moved by each piece
 - Slides out from bottom
 - Drilled holes to show landslide dropping.



Final Design Cnt.

- Spray painted model
 - Two tones:
 - Light green on bottom, darker on top
- Plexiglass case finish



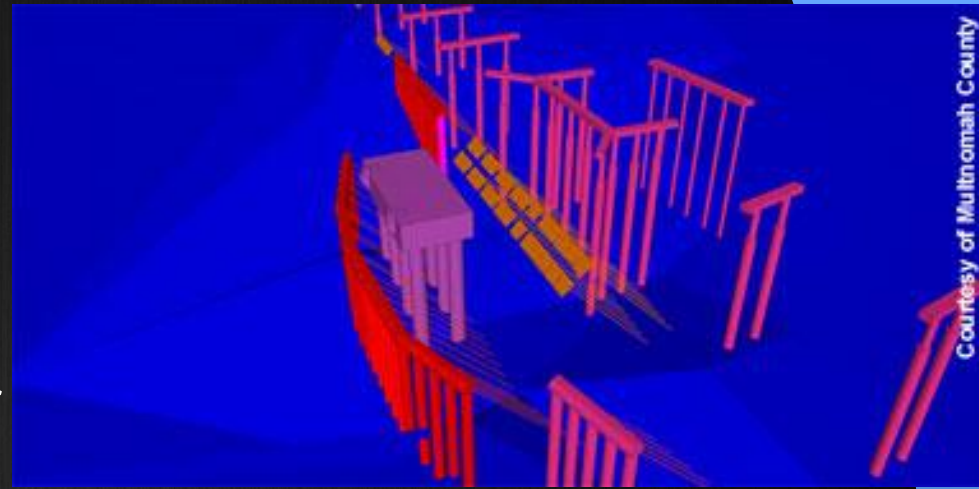
Project Description

Teams' Job:

- Show topography changes
- Remediation
- Model Ground Anchors, Shear Piles etc.
- West side of bridge

Why Sellwood?

- Opened doors for scholarships
- Wanted a challenge
- Exposed to real life situations



Key Concepts

- Sellwood bridge was built on an unstable location, which caused the bridge to buckle
- The P.M. team's job is to model all of the remediation
- A.M.'s job was to model the landslide itself



Changes From Proposal to Design

Team Proposal:

- Scale: 1"=12'
- Prototype: 1"= 16.25'

Initial Materials:

- Foam
 - 2x4
- Chicken Wire
- Paint
- Plaster cloth/ plaster

- Initial Methods:

- Chicken wire for shaping
- 2x4 for bracing
- Foam for topo

Team Design:

- Final Scale: 1"=15'

Final Materials:

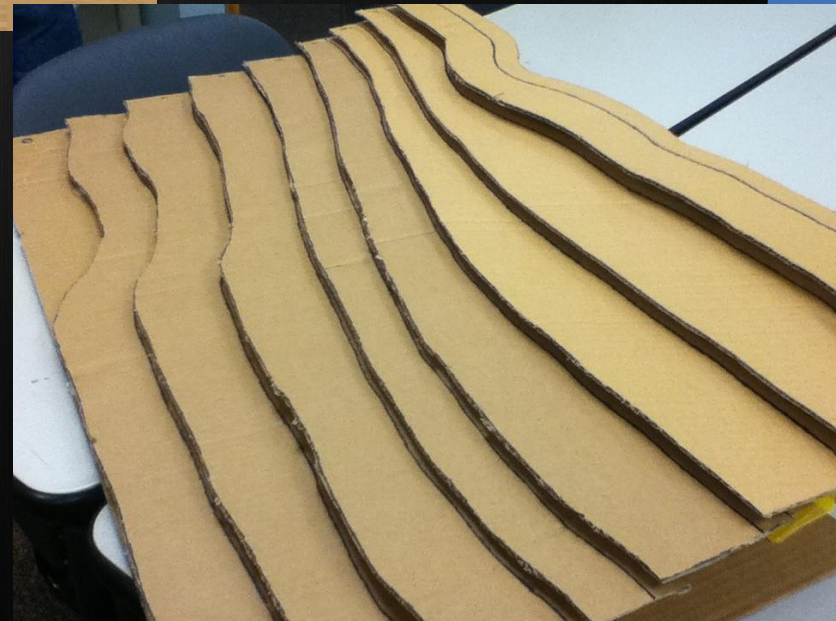
- Wood
 - CardBoard
 - Foam Blocks
- Window Screen
 - Plaster cloth/Plaster
- Paint

- Final Methods:

- Window Screen:
support/shape
 - Foam Blocks for bracing
 - Plaster Cloth for shaping
 - Plaster for covering

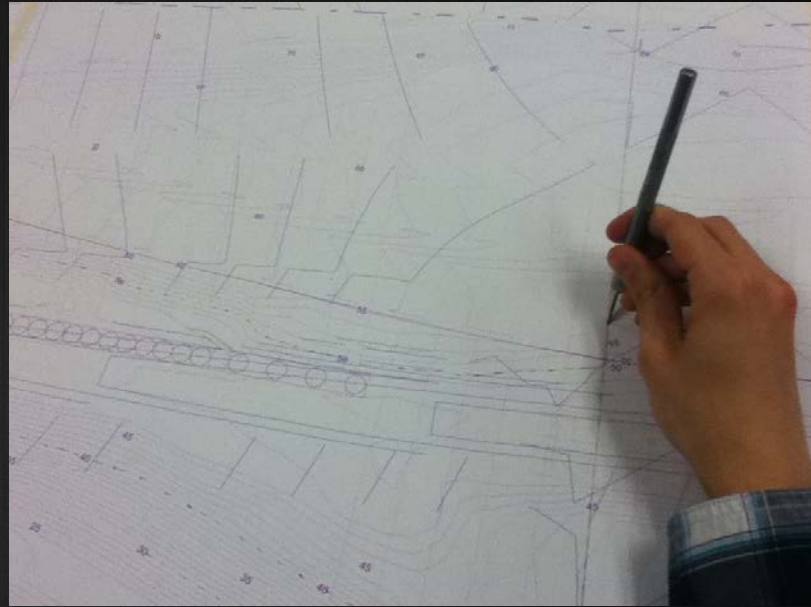
Prototype

- Built a Prototype of the topography
 - Found Site
 - Projected and traced to the exact scale
 - Traced onto cardboard
 - Cut out and glued
- Materials:
 - Cardboard
 - Glue
 - Toilet paper rolls
 - Tape



Final Model

- Printed AutoCAD File
 - Traced topography lines
 - Marked remediation locations
 - Covered topography:
 - Window screen
 - Plaster
 - Created remediation
- Materials:
 - Wood
 - CardBoard
 - Foam Blocks
 - Window Screen
 - Plaster cloth/Plaster



Challenges

- Vocabulary

- Ground Anchors
- Shear piles
- Kips

- Communication

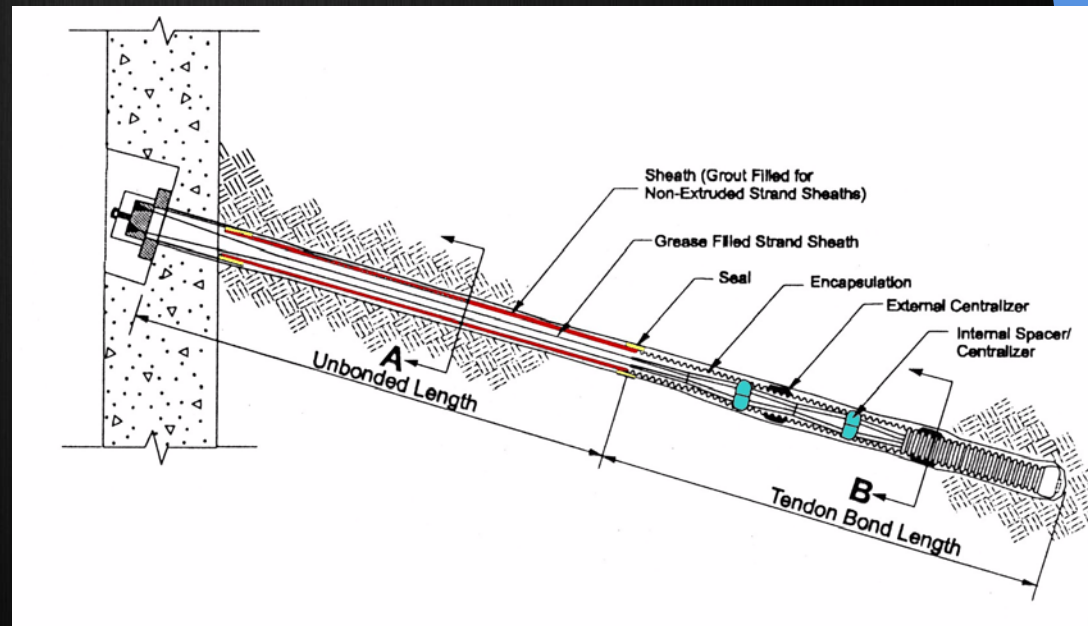
- A.M./P.M.

- Conversions

- Scales

- Calculations

- Understanding what numbers meant



Math and Science Competencies

Math Competencies:

- M4.1: Organize and consolidate their mathematical thinking through communication.
- I'll be telling my group, what kind of mathematical ideas I am thinking of through concept sketch, or just by talking.
- M4.4: Recognize and use connections among mathematical ideas
- I'll be using connections between all the geology and mathematical ideas to figure out all the slopes and angles.
- M4.6: Use representations to model and interpret physical phenomena
- I'll be using the models to interpret a physical phenomena.

Science Competencies:

- S2.1: Identify problems and locate information that lead to solutions
- I'll recognize problems that might be a factor in the end
- S3.1: Understand that any collection of things that have an influence on the one another can be thought of as a system
- I'll need to understand that all the tiebacks that will be put into place will influence all of the hill and will be know as a system.
- S3.2: Understand that a model is a tentative scheme or structure with explanatory power
- I'll need to understand that these models that will be built will teach people a lot about the landslide at the sellwood bridge

Personal Learning

- Better Teammates
 - Supportive
 - Separate Tasks
 - Contributed ideas
- Problem Solving:
 - Trial and error
 - Researching
 - Asking questions
- We learned how to work as a team, and not individually



Questions?