

### Detention Pond Project

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- The University of Memphis is seeking to build a detention pond near the Engineering buildings in the Summer of 2026 and would like to invite initial bid proposals for design and construction.
- There are four available sites on University property appropriate for the project.
- The bid/proposal must include an analysis of each assigned site with several alternative designs for the detention pond.

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- From this analysis, one detention pond design for construction is recommended. All construction must be complete before August 1, 2026.
- The final packet submitted for the bid/proposal is due no later than April 28, 2026, and must include the following:
  - A technical report that includes:
    - An analysis of each site
    - A recommended design
    - An estimated budget for the completion
    - Appendix (additional tables, charts, graphs)

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### Detention Pond Project

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- Please address all questions, comments, and correspondence to:
 

Dr. Claudio Meier, Project Director  
 Department of Civil Engineering  
 The University of Memphis  
 Memphis, TN 38152
- Each team should prepare a full formal technical report with a poster presentation supported by recent and relevant research

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### Detention Pond Project

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#### Detention Pond Project Description

- The objective of this project is to design a stormwater detention pond on the site assigned to your group in the lab.
- The detention pond must provide a maximum storage of 50,000 gallons, meet all design criteria, and minimize the project's total cost.

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### Detention Pond Project

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#### Detention Pond Project Description

The pond design criteria are:

- The side slope on the inside of the pond embankment cannot be greater than 1:2
- The side slope on the outside of the pond embankment cannot be greater than 1:3
- The crest of the pond embankment should be 10 ft. wide to accommodate a vehicle.

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#### Detention Pond Project Description

The pond design criteria are:

The diagram shows a cross-section of a detention pond embankment. The crest is labeled as 10 ft wide. The left side slope is indicated by a triangle with a vertical side of 1 and a horizontal side of 3, labeled 1:3. The right side slope is indicated by a triangle with a vertical side of 1 and a horizontal side of 2, labeled 1:2. A blue line representing the water level is shown 1 ft above the top of the embankment, with a vertical dimension line and the label '1 ft.' and 'Water level'.

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## Detention Pond Project

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### Detention Pond Project Description

The pond design criteria are:

- The soil used to construct the pond embankment must be compacted.
- The cut or loose soil volume is reduced by 15% when compacted.
- The pond embankment must have a spillway that is not placed on compacted material (if possible).

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## Detention Pond Project

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### Detention Pond Project Description

The pond design criteria are:

- Side slopes of the pond embankment must be protected from erosion.
- The water level must be at least 1 ft. below the crest of the pond embankment.
- Minimum width of the spillway is 10 ft.

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### Detention Pond Project Description

Typical Costs are:

- On-site cut and fill: \$5/yd.<sup>3</sup>
- Off-site fill: \$25/yd.<sup>3</sup>
- Off-site cut: \$15/yd.<sup>3</sup>
- Concrete (delivery and labor): \$150/yd.<sup>3</sup>
- Pond embankment protection:
  - vegetation \$2/ft.<sup>2</sup>
  - stone \$10/ft.<sup>2</sup>
  - concrete \$20/ft.<sup>2</sup>

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### Detention Pond Project Description

These cost estimates are *preliminary*.

- Over time, as additional cost items are required, a current list of costs will be posted on the class web page.
- Please regularly check the web page on the project's status.
- In addition, all supplemental information posted on the web page will be announced in class.

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### Detention Pond Project Description

The detention pond project poses several challenges to each group:

- Developing an accurate topographic survey of the site
- Designing the detention pond to meet criteria
- Locating the detention pond on the site such that cut-and-fill is minimized
- Developing a sound engineering solution that meets the design criteria while minimizing the project cost

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## Detention Pond Project

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### Detention Pond Project Description

The analysis skills required in this project are:

- Topographic computations for contour maps
- Traverse computations for estimating areas
- Estimating cut-and-fill for the pond and the embankment
- The configuration of the pond spillway
- Develop spreadsheets to compute information for topographic maps, traverse areas, and the minimization of cut-and-fill

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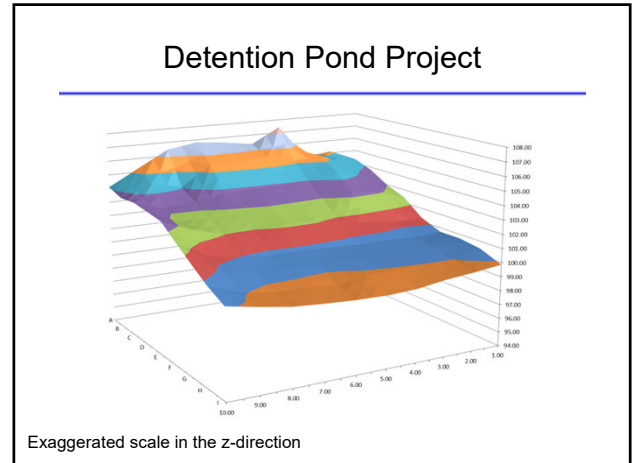
### Detention Pond Project

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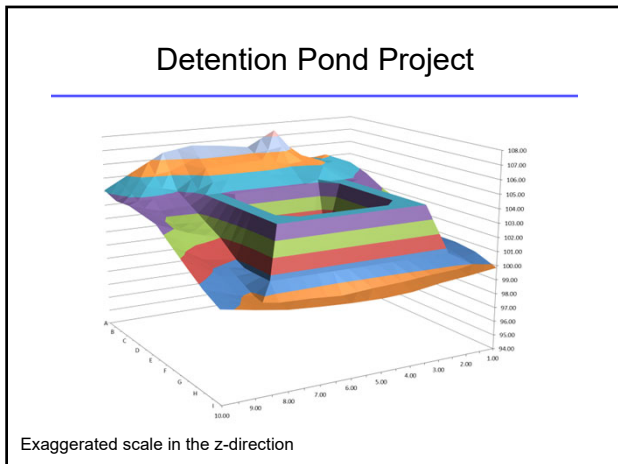
The detention pond project schedule:

Date	Activity
April 14-16	Traverse and topographic survey and contour map of site
April 22-23	Cut-and-fill calculations
April 28	Detention pond design bid package and poster presentation - 1:00 p.m.

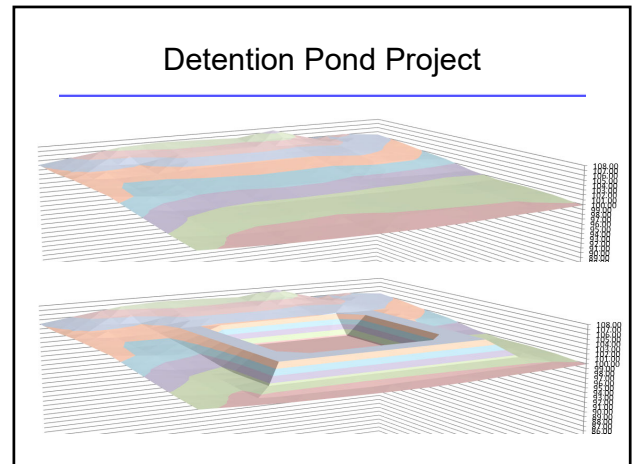
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### Detention Pond Project

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## Any questions?

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