

# Engineering Project Algebra 1 Honors 2014

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*Objective: Students will design a mock neighborhood and apply mathematical principles used by engineers to convert undeveloped property into a housing development. Students will then use generated data to determine the economic feasibility of the development of the property.*

## Phase 1

Basic Survey - Students will create initial scale drawing and perform the following calculations:

- Find area of the property
- Convert from square feet to acres
- Compute average elevation
- Find the volume of the unsuitable fill (muck)
- Find average elevation of the suitable fill (starting elevation)

## **Vocabulary**

Area

Volume

Elevation / Grade

Plan

Section

## Phase 2

Students will use a scale drawing to compute the following:

- Lot areas for 7 different lot configurations
- Lake area
- Road elevations using slopes
- Road slopes using elevations and distances
- Draw and complete a cross-section for a lake

## **Vocabulary**

Slope

Cross section

Lot

## **Phase 3**

Students will calculate areas for:

- Roadway
- Building pads
- Setback Areas
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Students will calculate average finished grades for:

- Roadway
- Building pads
- Setback areas

Students will calculate volume of fill needed for

- Roadway
- Building pads
- Setback areas

## **Vocabulary**

Building pads

Setbacks

Average finished grade

Fill

Compaction

## **Phase 4**

Students will determine the drainage needs of the development and the cost of drainage system

- Compute Drainage areas
- Compute Flows
- Determine Pipe sizes
- Number of inlets
- Compute the Cost of the Drainage System

## **Vocabulary**

Drainage area

Flow / Runoff

Pipe

Inlet / Catch Basin

Storm Intensity

## **Phase 5**

Students will determine economic feasibility of the development

Estimate Project Costs

Estimate Project Revenues

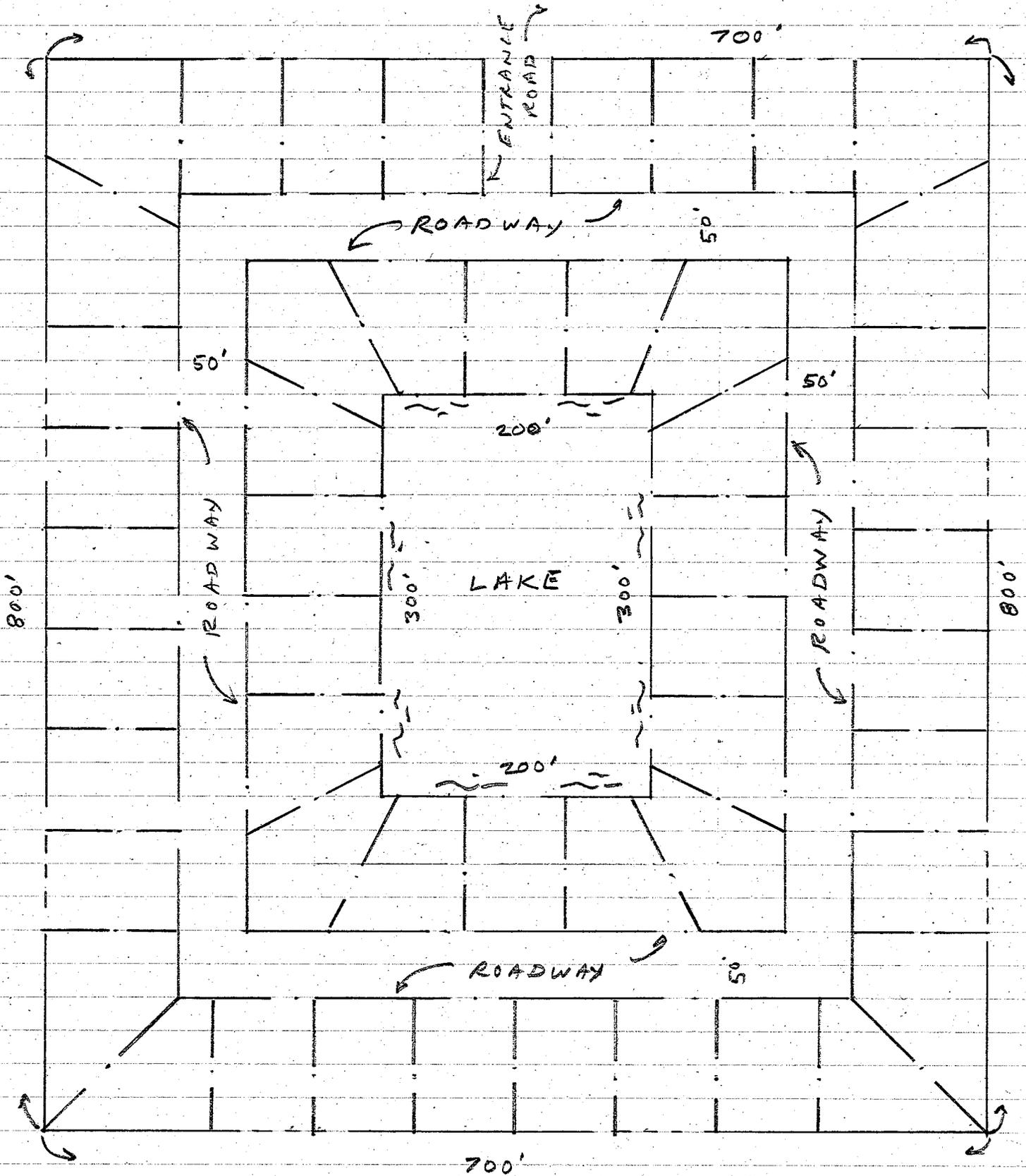
## **Vocabulary**

Profit/loss

Contingency

Cost Estimate

MAIN ROADWAY



SITE PLAN

SCALE 1" = 100'

NORTH