TEST 1
Due October 5th 2022 10:00 am

Take-Home Test Agreement

CE 5338 Hydrology
Test 1
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Student:
You are responsible for your own work. By signing this document you agree that all of the work was completed by you, the format of the exam was followed, and there were no mitigating factors that would infringe on your ability to take this exam.

I__Ronald Adomako____ agree to these terms _____Date:___10/4/22_____
  (Print Name)   (Signature)

Summary:
The following describes a possible development near the top of the watershed (we'll assume no flow into this site from upstream). Several maps are provided to help understand the geometric and topographic situation. The USGS map showing 20' contours is considered correct. The ArcMap data with 2' contours is provided to increase precision, but not accuracy.

Use the Springfield Manual to determine the flowrates and pipe sizes for the following catchments that are defined below. Inlets for areas are already placed (don't size them, but do determine flow rates). You'll determine the street drainage (size these). You'll route the pipe network to the detention on the west side of the development.

Street inlets: (Do this first) You'll need to decide sizes (length) and locations of street inlets to conform with city criteria. Don't size the inlets for areas, only streets. You must consider efficiency, bypass flow, and street inundation. Since the street area is going to be complicated, make as many simplifications as you need to complete the test. You are expected to state those simplifications. The residential area on the north will drain to the street curb. On the south side of the street all of those areas will be draining to the inlets shown as boxes. You'll still need to place street drains on the south side to drain only the south half of the road from the crown. The street is considered "local."

Rational C: Take a qualitative guess at what C is by visually weighting each area's slope. This simplifies the math and also the test layout.

NOTES:
It's likely there is additional information that is needed. Please send me an email for clarification and I'll decide if I will share that with the class or if the information is needed, etc.

I know that some of the possible overland flow paths are longer than allowable by city code. Please ignore this stipulation and complete such calculations with the longer flow path.

It's up to you to decide pipe network configuration, but don't expect deductions for that unless something is very strange about your choice. Slope of pipes will be determined by the land slope (assume little to no grading of the sites). All water in the development will be routed to the detention.
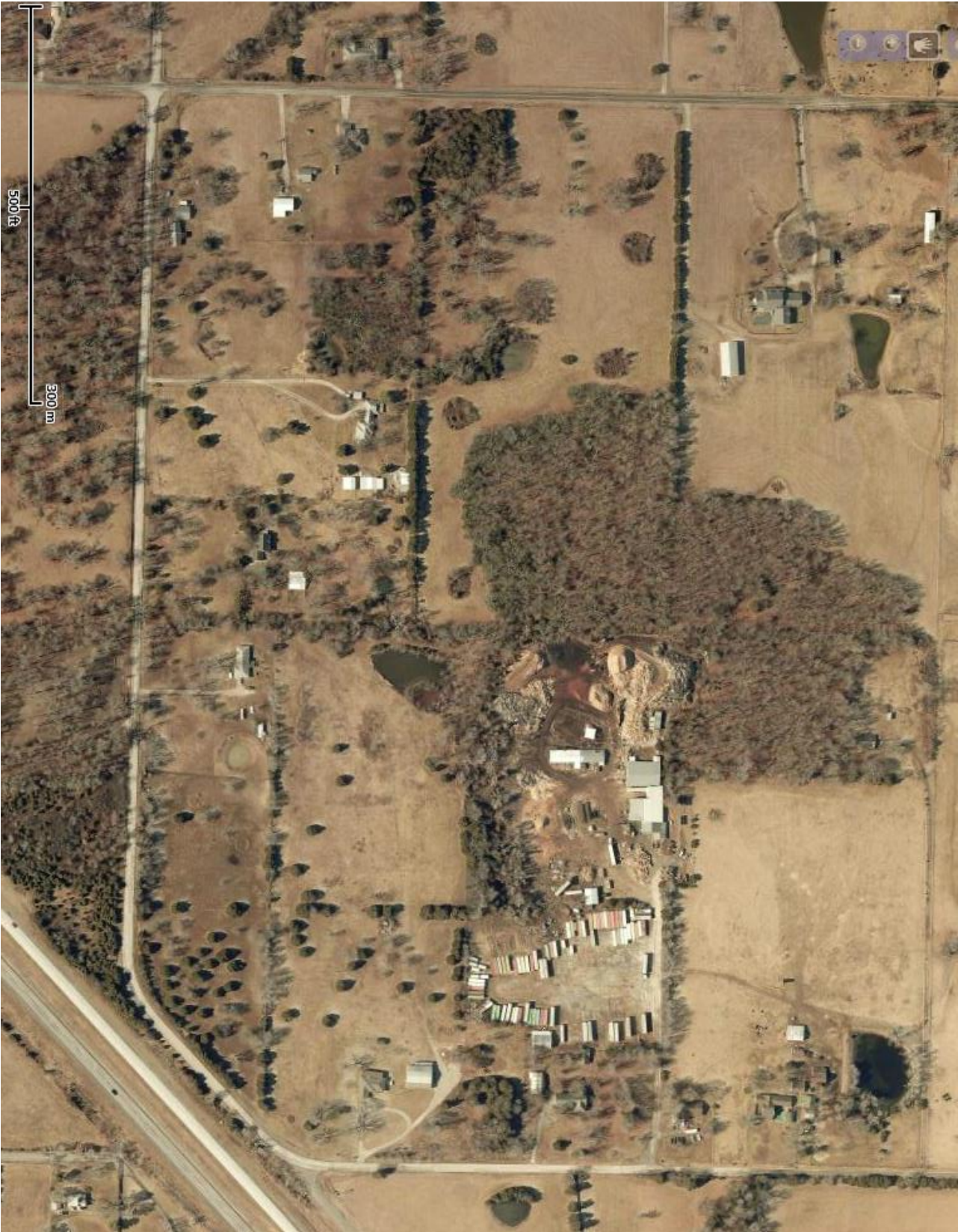
Submit one .pdf document with the following in order:

- A paragraph or less executive summary.

- A summary table of pipe ID#, sizes, locations, and lengths.

- A quantities table used for determining cost (no need to look up costs, just add up the quantities of the same material).

- A schematic drawing of your pipe network include pipe ID#.

- Formal Statement of Assumptions.

- Brief narrative of your process and any supporting documentation (spreadsheet screen shots, calculations, etc).

- A paragraph of any "consultation" type of comments, i.e. "This layout could be improved by…" or "easements will limit construction within … area." (not explicitly required and often treated as extra credit)
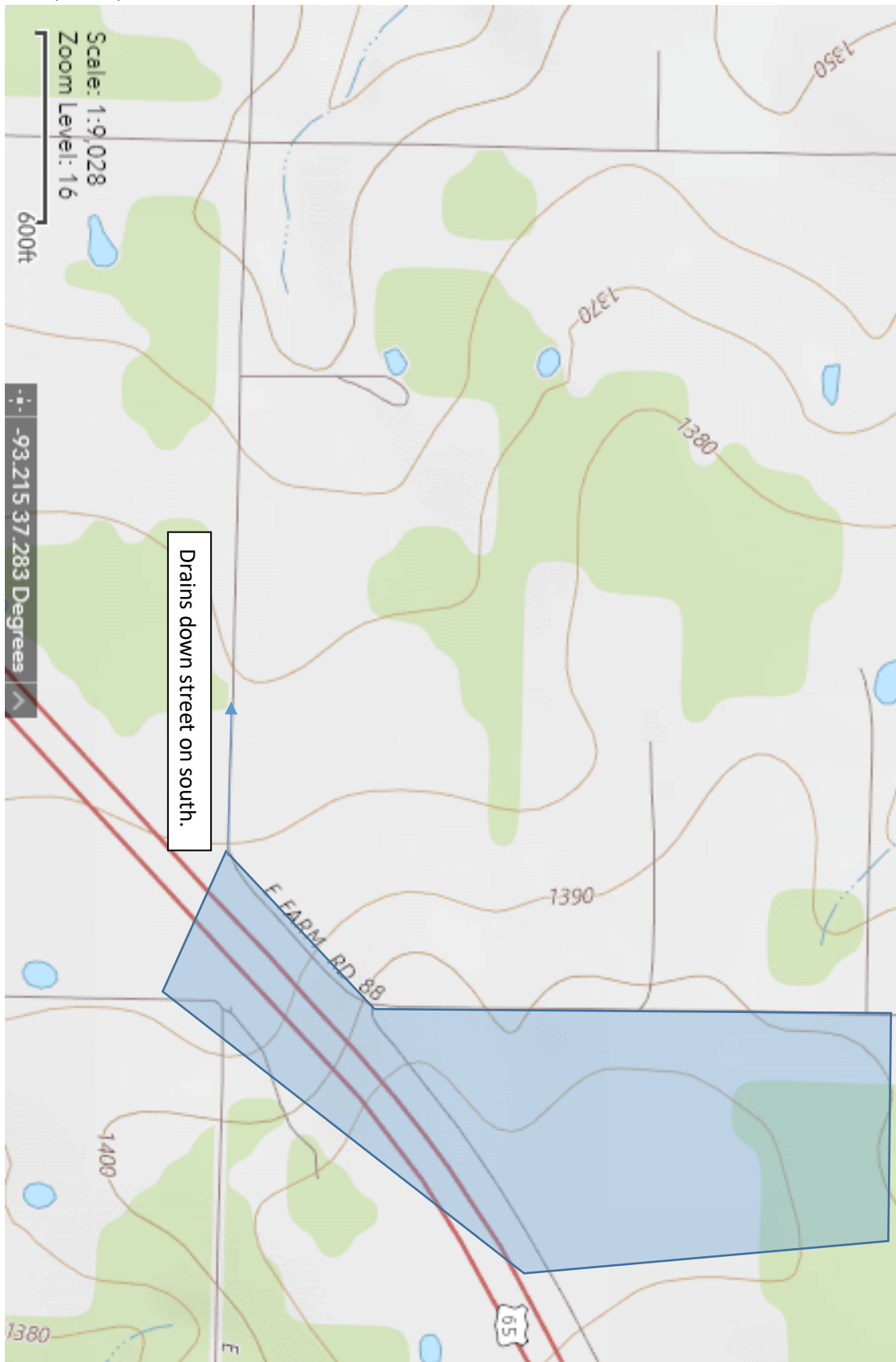

Grades are based on:
- Sizing inlets (20 points)
- Rational method (20 points)
- Statement of assumptions and documentation (20 points)
- Figures (20 points)
- Summary and quantities (20 points)

Satellite:

USGS Topo Map

-93.215 37.283 Degrees

Drains down street on south.

1350

1370

1380

1390

1400

1380

E FARM RD 88

65

Development Area:

ArcMap

Detention

A8 0.89acres

A7 1.33acres

A1 4.17acres

A6 1.16acres

A5 1.85acres

600 ft

A4 0.72acres

A3 1acres

A2 0.79acres

Detention

600 ft

E FARM RD 88

1390