Construction Scenario:

The at-grade crossing of the Jordan River Parkway Trail crosses 9000 South Street near the Jordan River (Figure 1). This crossing is to be improved with a grade separation that may include the following options.

1. Cut-and-cover tunnel
2. Overpass structure
3. Overpass structure with embankment (e.g., MSE walls, light-weight embankment)

The project may consist of the following structures:

1. Concrete overpass structure
2. Steel overpass structure
3. MSE wall
4. Concrete or asphalt trail

Planned foundations and retaining systems

- Bridge structures will be pile supported
Instructions and Requirements:

You are to develop a geotechnical investigation plan and cost proposal for the above project. Your proposal does not need to include costs for the geotechnical design, but should include all field and laboratory evaluations. Present your proposal in report format. Complete this assignment in short report format and include the following headings. The typed part of the proposal should not be longer than 5 pages (12 point, 1.5 page spacing), excluding figures, tables, drawings, photos, etc.

I. Introduction/Project Description

II. Investigation Strategy

a) Describe the sampling strategy and what general geotechnical issues are to be investigated by the geotechnical program. Discuss how the data you plan to gather will support the resolution of geotechnical/subsurface issues and how it will support the design.

b) Show the proposed test pits, boreholes and CPT locations (plan view drawing showing the CPT soundings and borehole locations).

c) For your recommended investigations, make a table for each borehole that shows the sampling and testing requirements. This table should include the following items and be clear enough so that a field engineer/geologist can implement your test program.

1. Depth of sample
2. Type of sampler (split-spoon, Shelby, other, etc.)
3. Required laboratory tests to be performed on sample (e.g., moisture content, density, Atterberg limits, consolidation, shear strength tests, etc.)

III. Cost Proposal

1. Use the attached cost schedules. (Note that not all in situ and laboratory tests that you need may be in these schedules. If you need a test not listed, try to obtain a typical cost from an internet search or make a reasonable approximation of the unit cost).

2. Your cost proposal should include all labor, drilling and testing costs. Assume that the following:

   • Field investigations costs = direct cost (your cost) + 15 percent
   • Equipment rental and supplies = direct costs + 15 percent
   • Laboratory Tests = costs given on cost schedule (do not mark up)
   • Engineering/Geologist/Technician Costs (do not mark up)
   • Direct Charges (do not mark up)

VI. Schedule (Major tasks and their duration).
**FIELD INVESTIGATION:**

- Drilling & Sampling .......................... cost + 15%
- Equipment Rental or supplies ............. cost + 15%
- Project Engineer & Geologist as listed below.

**LABORATORY TESTING**

<table>
<thead>
<tr>
<th>Test Description</th>
<th>Charge</th>
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</thead>
<tbody>
<tr>
<td>Moisture Content</td>
<td>$15.00</td>
</tr>
<tr>
<td>Natural Density &amp; Moisture Content</td>
<td>$17.00</td>
</tr>
<tr>
<td>Atterberg Limit (ASTM D-423 &amp; 424)</td>
<td>$30.00</td>
</tr>
<tr>
<td>Specific Gravity (ASTM D-854)</td>
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</tr>
<tr>
<td>Gradation Analysis (ASTM D-422)</td>
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</tr>
<tr>
<td>All standard sieves up to 200 sieve</td>
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</tr>
<tr>
<td>Loss than 1 1/2&quot; to #200 sieve</td>
<td>$27.00</td>
</tr>
<tr>
<td>Percent Loss than #200 sieve</td>
<td>$12.50</td>
</tr>
<tr>
<td>Hydrometer Analysis</td>
<td>$27.00</td>
</tr>
<tr>
<td>pH</td>
<td>$10.00</td>
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<tr>
<td>Water Soluble Sulfates</td>
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</tr>
<tr>
<td>Radiactivity</td>
<td>$25.00</td>
</tr>
</tbody>
</table>

**Permeability**

- Rigid Wall - Undisturbed                      $76.00
- Flexible Wall
  - Samples up to 4" diameter                   $200.00
  - Per day after initial 4 days                $25.00
  - Additional confining pressures              $50.00
  - 12" diameter samples                        $38.00
  - Per day after initial 4 days                $40.00
  - Additional confining pressures              $60.00
- Client supplied leachate add                  $100.00

**Leachate damaged equipment** cost + 15%

**Gradation Analysis**

- Gradation Analysis                           $125.00
- Particle Distribution                        $125.00

**Moisture-Density Relationships**

- ASTM D-888 (Std. Proctor)                    $70.00
- ASTM D-1557 (Mod. Proctor)                   $80.00
- Check Point                                   $125.00

**Relative Density**

- California Bearing Ratio (ASTM D-1883)        $85.00
- One Point                                     $120.00
- Three Points                                  $220.00

**Sample Preparation**

- Chemical Testing on request                  $70.00-$90.00/hour
- Rock Testing on request                      $65.00-$80.00/hour
- Sample Preparation                           $25.00/hour
- Special Consultation, Expert Testimony and Court Appearance $500 - $1,000/day

**ENGINEERING/ GEOLOGY/ TECHNICIANS**

- Senior Project Engineer/Geologist            $70.00-$90.00/hour
- Project Engineer/Geologist                   $65.00-$80.00/hour
- Staff Engineer/Geologist                     $45.00-$55.00/hour
- Jr. Engineer or Technician                    $35.00-$45.00/hour
- Draftsperson                                  $25.00/hour
- Typist                                        $25.00/hour

**FIELD OBSERVATION AND TESTING**

- Construction Observation and Field Testing of Soil on request

**DIRECT CHARGES**

- Auto or 2-wheel drive Pickup $30.00/day + 60.32/mile
- 4-wheel drive Pickup $35.00/day + 60.35/mile
- Out-of-Town Living Expenses Cost + 15%
- Computer Time (in-house) $20.00/hour
- Photocopies/binding Cost + 15%
- INTEREST CHARGE AFTER 30 DAYS FROM INVOICE DATE 1.5% per month