DESIGN CONSULTANT AGREEMENTS
SOILS-RELATED TASK ASSIGNMENTS

GEOTECHNICAL DESIGN PROCEDURE
GDP-12
Revision #2

AUGUST 2015
GEOTECHNICAL DESIGN PROCEDURE:
DESIGN CONSULTANT AGREEMENTS
SOILS-RELATED TASK ASSIGNMENTS

GDP-12
Revision #2

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING BUREAU

AUGUST 2015
# TABLE OF CONTENTS

## I. GEOTECHNICAL DESIGN

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bridge Foundation</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Walls</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Culverts and Pipes</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Slope and Stream Channel Protection</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>Pavement Design</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>Fills</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>Cut Slopes</td>
<td>6</td>
</tr>
<tr>
<td>8</td>
<td>Sign Foundations</td>
<td>6</td>
</tr>
<tr>
<td>9</td>
<td>Noise Barriers</td>
<td>7</td>
</tr>
<tr>
<td>10</td>
<td>Recharge and Leaching Basins</td>
<td>7</td>
</tr>
<tr>
<td>11</td>
<td>Rock Slopes</td>
<td>7</td>
</tr>
<tr>
<td>12</td>
<td>Superstructure and Substructure Removal by Blasting</td>
<td>7</td>
</tr>
<tr>
<td>13</td>
<td>Laboratory Testing</td>
<td>8</td>
</tr>
</tbody>
</table>

## II. SUBSURFACE EXPLORATIONS

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Borings by State Forces</td>
<td>9</td>
</tr>
<tr>
<td>15</td>
<td>Borings by Consultant-Let Drilling Contract</td>
<td>9</td>
</tr>
<tr>
<td>16</td>
<td>Borings by State-Let Drilling Contract</td>
<td>10</td>
</tr>
<tr>
<td>17</td>
<td>Borings by Procurement</td>
<td>11</td>
</tr>
</tbody>
</table>
SOILS-RELATED TASK ASSIGNMENTS

The New York State Department of Transportation often designates consultants to perform design services. The general tasks are defined in the Base Scope of Services. However, the Base Scope of Services does not specifically address the various aspects of geotechnical design.

The NYSDOT’s Geotechnical Engineering Bureau (GEB) and the Regional Geotechnical Engineers (RGE) are the Department’s experts on geotechnical design. Even when geotechnical design functions are delegated to the consultant, the GEB and RGE’s have significant oversight, support and review functions.

This manual divides responsibilities for various soils-related tasks and defines the information needed to complete those tasks. It documents how to assign tasks once the Department has made the decision to use consultant design and/or inspection services. For geotechnical related tasks, the first point of contact should be the RGE, who will then provide direction to the appropriate destination.

I. GEOTECHNICAL DESIGN

1. Bridge Foundations

   1.1 Spread Footings

       1.1.1 State Provides: Allowable bearing capacity, coefficient of sliding, doweling or keying requirements, expected settlements, special foundation treatments, subsurface profile drawing, special notes and specifications

       1.1.2 Consultant Provides: Preliminary and final structure plan, anticipated footing loads, allowable settlement, footing elevations, seismic requirements

   1.2 Deep Foundations

       1.2.1 State Provides: Recommended type and size of foundation, ultimate and allowable pile-soil capacity, expected lengths, soil liquefaction potential and its effects and recommended treatment, soil profile type for seismic design of downstate bridges, seismic design parameters (accelerations, soil parameters, etc.), seismic performance criteria (lateral deflection, maximum bending moments), rock acceleration-time histories, stiffness matrix for pile groups and
drilled shafts, seismic ground response analysis including response spectra, expected settlement, and any special treatment such as bored-in piles, drag-reduction methods, etc., subsurface profile drawing, special notes and specifications, lateral load analysis results for drilled shafts

1.2.2 Consultant Provides: Preliminary and final structure plan, anticipated footing loads on the foundation element, allowable settlement, footing elevations, 3-dimensional ground response analysis, allowable lateral drilled shaft or pile deflections, scour analyses, site assessments of adjacent facilities (i.e. buildings) and vibration limits, stiffness and damping matrices for complex structures (bascules, etc.)

2. Walls

2.1 Sheet Pile Walls

2.1.1 State Provides: Unit weight of soils, angle of internal friction, cohesion, groundwater elevation, special specifications, pressure distribution, sheeting section modulus, sheeting embedment, wale and bracing loads, factor of safety

2.1.2 Consultant Provides: Plans, profiles, cross sections, tip elevation, bracing and waling details

2.2 H-Pile and Lagging Walls

2.2.1 State Provides: Unit weight of soils, angle of internal friction, cohesion, groundwater elevation, special specifications, pressure distribution, embedment depth, pile spacing (for temporary walls), lagging thickness (for timber lagging), rock socket design, pile section modulus, factor of safety

2.1.2 Consultant Provides: Plans, profiles, cross sections, permanent lagging type and design (if other than timber), tip elevations, pile spacing (for permanent walls), waling and bracing details
2.3 **Gravity Walls**

2.3.1 State Provides: Unit weight of soil, angle of internal friction, cohesion, groundwater elevation, factors of safety against overturning and sliding, allowable bearing capacity, friction factors

2.3.2 Consultant Provides: Plans, profiles, cross sections, actual bearing pressure if on rock

2.4 **GRES Walls**

2.4.1 State Provides: Recommended construction sequence, requirements for geosynthetic strength, backfill type and compaction requirements, reinforcement length, specification, details

2.4.2 Consultant Provides: Plans, profiles, cross-sections

3. **Culverts and Pipes**

3.1 State Provides: Settlement estimates, camber requirements for large culverts and pipes, bedding requirements

3.2 Consultant Provides: Plans, profiles and cross sections showing fill heights over the culvert or pipe.

4. **Slope and Stream Channel Protection**

4.1 State Provides: Type, thickness, limits, and Item number of slope protection, geotextile requirements, and ditch recommendations

4.2 Consultant Provides: Plans, profiles and cross sections

5. **Pavement Design**

5.1 State Provides: AADT’s, truck counts, ESAL’s, pavement type and thickness, design requirements to ensure subgrade stability, requirements for pavement drainage, toe-of-slope ditches, granular construction lifts, and possible or available granular material sources,
5.2 Consultant Provides: Plans, profiles, cross sections, NYS plane coordinates, surveyed baseline, and all plan and profile changes during design development

6. Fills

6.1 Embankments

6.1.1 State Provides: Necessary analyses and treatments to safely construct embankments and to minimize post-construction settlements and stability problems

6.1.2 Consultant Provides: Plans, profiles, cross sections, contours of existing conditions, NYS coordinates, all plan and profile changes during design development, ROW and easement information

6.2 GRES Slopes

6.2.1 State Provides: Recommended construction sequence, requirements for geosynthetic strength, backfill type and compaction requirements, reinforcement length, specification, details

6.2.2 Consultant Provides: Plans, profiles, cross-sections, ROW and easement information

7. Cut Slopes

7.1 State Provides: Requirements to ensure cut slope stability, areas to obtain "borrow", earthwork factors

7.2 Consultant Provides: Plans, profiles, cross sections, contours of existing conditions, NYS coordinates, all plan and profile changes during design development, ROW and easement information

8. Sign Foundations

8.1 State Provides: Design requirements to ensure stability of large sign foundations, or any sign foundation in soft or weak soils, and to limit settlements to tolerable amounts.
8.2 Consultant Provides: Sign locations, cross sections of sign foundations, and loading conditions on the sign foundation, including vertical loads and moments at the ground surface, torque on cantilever signs, allowable settlement amounts

9. **Noise Barriers**

9.1 State Provides: Design requirements to ensure stability and limit settlement of noise barrier foundations

9.2 Consultant Provides: Noise barrier locations, cross sections at noise barrier footing locations, barrier heights and loadings

10. **Recharge and Leaching Basins**

10.1 State Provides: Design requirements and soil permeability parameters for recharge and leaching basin design.

10.2 Consultant Provides: Plans, profiles, cross sections, basin design

11. **Rock Slopes**

11.1 State Provides: Recommendations for rock slope design, rock bolt and anchor design, rock slope treatment recommendations

11.2 Consultant Provides: Plans, profiles, cross sections, NYS plane coordinates, surveyed baseline

12. **Superstructure and Substructure Removal by Blasting**

12.1 State Provides: Recommendations for structure and substructure removal by blasting, notes concerning vibration monitoring due to blasting and/or construction

12.2 Consultant Provides: Plans, profiles, cross sections
13. **Laboratory Testing**

13.1 State Provides: For all uncontaminated soil and rock: moisture contents and visual descriptions for soil samples, soil strength, permeability and consolidation characteristics, gradations, and other specialized soils testing, rock core analysis.

13.2 Consultant Provides: Soil samples, if required under Section II. SUBSURFACE EXPLORATION. Performs tasks described in 13.1 for all contaminated soil and rock.
II. SUBSURFACE EXPLORATIONS

Subsurface exploration may currently be performed by one of four methods on Consultant-designed projects: using State drilling forces; through a Consultant-let drilling contract; through a State-let drilling contract and by procurement contract. The method used should be determined by the Project Manager and the Regional Geotechnical Engineer based on the scope of work and available Departmental resources.

14. Borings by State Forces

14.1 State Provides: Drillers, drill rigs and all necessary equipment, inspection, the number, depths and locations of borings as established by the Regional Geotechnical Engineer, right of entry for drill crews, official boring logs on the Geotechnical Engineering Bureau’s Boring Log Automation Program (BLAP), permit requirement determination at the Region’s option (i.e. railroad permit, permit to operate in navigable waterway from Corps of Engineers, etc.), laboratory testing, including visual descriptions, moisture contents, and other tests as required for all uncontaminated soil and rock.

14.2 Consultant Provides: Plans (including N.Y.S. Plane coordinates using the State Place Coordinate System North American datum (NAD 83) and the North American Vertical datum (NAV 88), anticipated substructure locations, culvert locations, large sign locations, high mast light pole locations, etc.), profiles, and cross sections, Maintenance and Protection of Traffic (MPT) plans, utility plans, and Permit requirement determination if the Region delegates this duty to the Consultant.

15. Borings by Consultant-let drilling contract

15.1 State Provides:

15.1.1 Specifications and special notes
15.1.2 The number, estimated depths, diameters, sampling interval, termination criteria, and locations of borings as established by the Regional Geotechnical Engineer.
15.1.3 Review of drill rig inspector qualifications and inspection of drilling equipment by the Geotechnical Engineering Bureau through the Regional Geotechnical Engineer

15.1.4 Laboratory testing, including visual descriptions, moisture contents, and other tests as required for all uncontaminated soil and rock

15.1.5 Permit requirement determination, if the Region elects to provide it (i.e. railroad permit, permit to operate in navigable waterway from C.O.E., etc.), Right of Entry form

15.2 Consultant Provides:

15.2.1 Bid package.
15.2.2 Qualified (based on GEB requirements) drill rig inspectors (one per rig), Chief Inspector
15.2.3 Drill hole location survey, including baseline station and offset, ground surface elevation, and NYS plane coordinate location.

15.2.4 Final typed drill logs for electronic signature on the BLAP [For small projects, the Region may perform this duty. Consult with the Regional Geotechnical Engineer].

15.2.5 M.P.T. and utility plans

15.2.6 Permit requirement determination, if the Region delegates this duty to the Consultant

15.2.7 For contaminated soil and rock, the Consultant will perform the tasks described in 15.1.4

16. **Borings by State-let drilling contract**

16.1 State Provides:

16.1.1 Specifications and special notes
16.1.2 The number, estimated depths, diameters, sampling interval, termination criteria, and locations of borings as established by the Regional Geotechnical Engineer

6.1.3 Review of drill rig inspector qualification and inspection of drilling equipment by the GEB through the Regional Geotechnical Engineer

16.1.4 Laboratory testing, including visual descriptions, moisture contents, and other tests as required for all uncontaminated soil and rock
16.1.5 Permit requirement determination, if the Region elects to provide it (i.e. railroad permit, permit to operate in navigable waterway from C.O.E., etc.), Right of Entry form

16.2 Consultant Provides:

16.2.1 PS and E Package for State letting
16.2.2 Qualified (based on GEB requirements) drill rig inspectors (one per rig), Chief Inspector
16.2.3 Drill hole location survey, including baseline station and offset, ground surface elevation, and NYS plane coordinate location using the State Place Coordinate System North American datum (NAD 83) and the North American Vertical datum (NAV 88)
16.2.4 Final typed drill logs for signature on the BLAP
16.2.5 M.P.T. and utility plans
16.2.6 Permit requirement determination, if the Region delegates this duty to the Consultant
16.2.7 For contaminated soil and rock, the Consultant will perform the tasks described in 16.1.4

17. **Borings by Procurement**

17.1 State Provides: Procurement contract package (specs, boiler plate, etc.), boring locations, approximate lengths and requirements, drilling inspection (State may opt to transfer this responsibility to the Consultant consult with the Regional Geotechnical Engineer), visual description and moisture content determination, drill log preparation, project management, money allocation, right-of-entry and other permits

17.2 Consultant Provides: Site plan sketch, drilling inspection (at State’s option), stakeout (Contractor performs clearing), final hole location and elevation survey using the State Place Coordinate System North American datum (NAD 83) and the North American Vertical datum (NAV 88)