

Geotechnical Drilling

The Office of Drilling Services (ODS) provides soil and rock exploratory drilling. A successful drilling program requires collaboration between the geoprofessional and ODS staff such that the expertise of both parties is utilized to the benefit of the Department.

Drilling Services employs foundation drillers, lead foundation drillers, senior foundation drillers and Branch Chiefs who are experienced in the various aspects of planning and executing geotechnical drilling operations. There is an [ODS Liaison](#) assigned to each Geotechnical Design Office and the geoprofessional is encouraged to contact their liaison for assistance in planning the site investigation and/or completing the work request.

Drilling priorities will be set by project schedule needs and job readiness.

ODS normal work schedule is 0700 hrs – 1730 hrs, Monday through Thursday (4/10 schedule). An alternate work schedule may be requested when drilling hours are subject to external constraints (e.g. to accommodate a traffic management plan or permit constraints). In consultation with the geoprofessional ODS management will determine the most appropriate schedule based on safety, efficiency, maximizing drilling time, bargaining Unit 12 contract rules, commercial drivers regulations, and minimizing overtime.

Requesting Drilling

The process for requesting drilling includes three steps: submit the *Drilling Request (Preliminary)*, complete the site preview meeting, and submit the final work request (*Drilling Request (Final)*, *Site Safety Plan*, and the *Site Assessment Questionnaire*).

Drilling Requests (Preliminary) may be for individual structures/locations, or by project (multi-structure/locations). The *Drilling Request (Preliminary)* should be submitted to ODS as early as possible, but typically no later than one month prior to the requested start date for drilling. The purpose of providing an early submission is to put the project on the preliminary drilling schedule and to provide ample time to conduct the site preview, obtain site access and allow efficient allocation of resources. The *Drilling Request (Preliminary)* for multiple structures will be divided into individual Drill Requests as agreed to at the site preview meeting. The *Drilling Request (Preliminary-multi)* will have the *Project Information* section completed and include all planned structures/drill locations in the *Remarks* section. For a single-structure/location a *Drilling Request (Preliminary)* will have the *Project Information* section completed, and other sections completed as much as possible.

The complete final work request, which includes the *Drilling Request (Final)*, *Site Safety Plan*, and *Site Assessment Questionnaire*, is to be received by ODS at least 1 week prior

to the requested start date in order for drilling to occur. Examples of completed forms are available on the [Drilling Services](#) website.

In general, final work requests are to include manageable quantities of work such that the information on the *Drilling Request*, *Site Safety Plan* and *Site Assessment Questionnaire* is useful. Hence, a *Drilling Request (Final)* should include only those borings for

- one bridge, building or large earthwork location (e.g. landslide)
- multiple minor structures or earthwork locations in close proximity that are covered by one USA ticket (e.g. two or more retaining walls, sound walls or slip outs)

Site Preview Meeting

After the receipt of the *Drilling Request (Preliminary)*, the layout plan showing the proposed borehole locations, the completed Site Assessment Questionnaire, and the allowable lane closure times (if traffic control is anticipated), ODS will conduct a site preview meeting with the geoprofessional. If Maintenance-assisted access is anticipated the geoprofessional should invite a Maintenance representative to the site preview meeting along with any other stakeholders such as Environmental personnel. At the site preview meeting a senior foundation driller and the geoprofessional will:

- Review/determine access to the planned borehole locations
- Discuss the type(s) of equipment best suited for the planned work
- Agree on the traffic control plan (no. of lanes closed, equipment, CHP support, etc)
- Look for utilities and mark for USA if not previously marked
- Discuss how the drilling work is to be separated into individual Drilling Requests (for multi-structure or lengthy projects)

Based on the site review the senior foundation driller may propose alternate borehole locations to reduce exposure of employees to traffic, avoid known utilities, or simplify access to the drill site, however, the final decision for borehole locations resides with the geoprofessional.

The senior foundation driller may document the meeting on a *Drilling Site Preview Report* and will forward a copy to the geoprofessional. The *Drilling Site Preview Report* documents any changes made to the preliminary drilling plan, and those changes will be reflected in the final Drilling Request(s).

Site Investigation Peer Review

At any time, if ODS or the geoprofessional determines that the drilling plan, defined by the *Drilling Request*, *Site Safety Plan* and *Site Assessment Questionnaire*, might benefit

from additional input, either can request a site investigation peer review meeting with the requesting design Office. The site investigation peer review meeting will be similar to those meetings identified in the Geotechnical Design Quality Management Plan, whereby the geoprofessional, the branch chief, a geoprofessional from another design office and ODS discuss the site investigation plan. The responsible Design Office will arrange the meeting.

Drilling Request

The Drilling Request consists of eight sections to be completed by the geoprofessional; *Project Information, Drilling and Sampling, Traffic Control, Maintenance Yard, Permits, Remarks, Installations, and Borehole Backfill.*

The *Project Information* section includes the Branch Chief's signature. Unsigned submittals must be by the Branch Chief, indicating that the Drilling Request has been reviewed and approved. The project should be chargeable at the time of submittal in order for ODS to process the request.

In the *Drilling and Sampling* section, indicate the type(s) of drilling and sampling requested. Identify all borehole locations on a layout plan sheet along with anticipated depths. If multiple drilling methods are anticipated, indicate which types and where on the layout plan.

The geoprofessional is responsible for planning all traffic control activities whether performed by the Department or consultants. If lane or shoulder closures are anticipated the geoprofessional should contact the appropriate District Traffic Operations Branch and request that they provide allowable closure times for the project. Provide specifics for traffic handling in the *Traffic Control* section including the number of lanes to be closed and the anticipated hours of work within the closure, and attach the traffic management chart to the *Drilling Request*.

The geoprofessional should contact Maintenance to determine if and when they will be able to provide the traffic control during the allowable times. It is not necessary that the geoprofessional agree on specific dates with Maintenance, rather the geoprofessional should verify that Maintenance has the capability to provide the support once the schedule is fixed. Enter the contact information for traffic control in the *Maintenance Yard* section.

The geoprofessional is responsible for contacting the District to acquire all permits required for the planned drilling operations, which may include permits to enter non-State property and/or environmental permits (e.g. Dept of Fish and Game). The District Project Engineer should help obtain the necessary documents, or alternatively refer the geoprofessional to the appropriate District Environmental personnel for

permitting activities. The permit may require additional work constraints for the investigation including timing, noise monitoring, or special protective measures. List the required permits in the *Permits* section and attach copies to the Drilling Request. Describe all special work required by the permit in the *Remarks* section.

If the planned boreholes are located off of the highway, describe the access constraints in the *Remarks* section. ODS will make the final determination on how to best access the borehole locations during the site preview meeting and will work with Maintenance or others to oversee and complete the access work. The geoprofessional is expected to support access work by acting as a coordinator between ODS and District Right-of-Way, Maintenance, Environmental or consultant.

Indicate the planned instrumentation, monuments and borehole backfill in the *Installations* and *Borehole Backfill* sections and for each planned borehole on the attached layout plan.

Site Safety Plan

The Site Safety Plan consists of five sections to be completed by the geoprofessional; *Project Information*, *Local Hospital*, *Physical Hazards*, and *Utility Clearance Data* and *Remarks*.

The *Project Information* section includes the Branch Chief's signature. Unsigned submittals must be by the Branch Chief, indicating that the *Site Safety Plan* has been reviewed and approved.

Determine the closest emergency medical facility to the job site and enter its information in the *Local Hospital* section. Contact the emergency medical facility directly to verify its location. A map showing the project site and verified directions to the nearest emergency medical facility is part of the *Site Safety Plan*.

Note potential or confirmed hazards such as poison oak, snakes, ticks, steep slopes, proximity to water courses, hypodermic needles, or potential violence toward Caltrans staff from local residents in the *Physical Hazards* section.

Clearance information for all utilities is documented in the *Utility Clearance Data* section. A Site Safety Plan has only one USA number.

The geoprofessional is responsible for obtaining all utility clearances as required by law, including [USA North](#) or [USA South/Dig Alert](#) and non-subscriber utilities such as Caltrans or local municipalities. In order to submit a complete work request to ODS

one week prior to the drilling start date it is recommended that USA/Dig Alert be contacted two weeks prior to the drilling start date.

Prior to the drilling start date, meet with utility locators or visit the site and verify that utility conflicts do not exist especially where gas, electric, and pressurized fluid lines are present. District Right-of-Way can assist the geoprofessional in identifying non-subscriber utilities and District Maintenance and/or Electrical Units can help identify and locate Departmental utilities such as electrical for traffic signals and lighting, irrigation utilities, and drainage facilities.

Site Assessment Questionnaire

The *Site Assessment Questionnaire* provides information on soil or groundwater contamination at the site. In most cases, if soil or groundwater contamination is expected or known to exist at the site, a consultant drilling company will perform the work. Information on procuring contract drilling services is available from the ODS liaison.

The geoprofessional completes the top portion of the *Site Assessment Questionnaire*, attaches a site plan showing the locations of planned boreholes, and submits it to the District Environmental Branch as early as possible. The environmental coordinator will complete the bottom portion of the form and return the Questionnaire to the geoprofessional. The *Site Assessment Questionnaire* is valid for one year only.

Drilling Schedule

The drilling schedule shows which jobs will be drilled on what weeks. The drilling schedule is emailed to all office chiefs and branch chiefs each week and the geoprofessional is encouraged to monitor the status of his/her projects each week. Drill projects are assigned one of three statuses:

- Red: *Drilling Request (Preliminary)* received. Project not ready to drill.
- Yellow: Site preview meeting completed. ODS committed to the drill start date subject to approval of the final work request.
- Green: Final work request approved. Drilling is scheduled.

There are many variables that control the status of a drill project, some of which are out of the geoprofessional's control. It is common for a drilling project to be delayed at the last moment due to employee illness, equipment malfunctions, weather, etc. Hence ODS prefers that projects be ready to drill at least one week in advance so drill crews can be re-assigned to new projects at the last minute. Typically it is easiest to reassign drilling to those jobs that do not depend on external assistance, such as traffic control services.

The Week Prior to Drilling

Each Monday, ODS conducts a schedule meeting and reviews all work for the current and following week(s). Projects on the schedule that are not ready (red and yellow) will be identified.

Each geoprofessional on the drilling schedule for the following week will be contacted to confirm the drilling start date and to:

- Verify that all paperwork is complete
- Verify that utility conflicts do not exist
- Verify that the traffic control support is committed to the schedule
- Review particulars of the work as necessary

Projects that are not ready one week prior to the scheduled start date may be rescheduled.

On Thursday ODS will contact the geoprofessional to:

- Review the planned drilling work
- Verify the schedule for the beginning of drilling (time, meeting place, etc.)
- Confirm lead driller and his/her contact information

The Week of Drilling

- On Monday morning, the lead worker will contact the geoprofessional to confirm details and provide the estimated departure time and anticipated start of drilling time.
- The geoprofessional will be at the drill site ready to conduct the tailgate safety meeting and begin drilling at the agreed start of drilling time. The geoprofessional will submit a copy of the completed and signed tailgate [Safety Meeting Report \(PM-S-0110\)](#) to ODS within two weeks of drilling completion.
- Geoprofessional will keep the Foundation Driller Leadworker informed regarding the progress of the job so ODS can adjust the work schedule if necessary.