

# GEOTECHNICAL POLICIES AND PROCEDURES MANUAL

## CHAPTER 3

### ROLES AND RESPONSIBILITIES



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## 1. PURPOSE

General job requirements and processes are provided in this Chapter. Areas discussed include such items as financial processes and approvals, general duties and expectations of Geotechnical Engineers, safety, accidents, travel, and various commonly utilized forms and procedures. This Chapter does not provide information concerning the technical requirements and processes encountered by Geotechnical Engineers, which are discussed in Chapters 5 through 14 of this Manual.

## 2. WORK AUTHORIZATIONS

Work performed by NDOT is the result of a fairly lengthy and complex budget process, which involves planning for future transportation system needs. Additionally, projects in construction may be assigned a contract charge number. This process includes the prioritization of needs, cost estimates for the various projects and, finally, budgetary approvals, culminating in final legislative approval. Consequently, fiscal year monies are earmarked for specific projects. Work which is not included in the budget is not authorized and should not be performed unless a specific exception is granted by the Principal Geotechnical Engineer, or higher level within the organization. It is important for Geotechnical Engineers to always be cognizant of the need to have proper authorization prior to commencing substantial work efforts.

## 3. APPROVAL PROCESSES

As a general rule, Geotechnical Engineers need to follow the normal chain of command for items requiring approval at a higher level. The chain of command for Geotechnical Engineers begins with the Principal Geotechnical Engineer, and then follows with the Assistant Chief Materials Engineer, the Chief Materials Engineer, the Assistant Director of Operations, the Deputy Director and finally, the Director.

While Geotechnical Engineers must get initial approval for most matters from the Principal Geotechnical Engineer, some items require specific ultimate approval by the Chief Materials Engineer. A partial list of these items follows:

- Training
- Permanent specification changes
- Research – must include a work plan
- Policy changes
- Change in duties
- NDOT Director's Office requests
- Nonrental equipment
- Budget augmentations
- Computer and software
- Contract change orders

- Out-of-state travel
- Written correspondence to FHWA and front office staff
- Proprietary products and specifications
- Money handling procedures
- Overtime

Approval processes and proper use of the chain of command are put in place to facilitate the uniform application of policies and procedures, and to insure proper communication and appropriate responsibility and accountability. Geotechnical Engineers are advised to adhere strictly to these policies.

#### **4. PERFORMANCE EXPECTATIONS**

Performance expectations, for Geotechnical Engineers to be successful and productive, fall into the two categories of technical and nontechnical performance. This Section provides some direction for the expectations in those areas.

##### **4.1 Technical Expectations**

Technical expectations can be described broadly as: Being responsible for providing accurate and timely geotechnical work. This includes verifying that the final contract documents are correct, that applicable Department approved materials are included, and that the job is constructible from a geotechnical point of view. Other technical expectations include plan review, on site design and support as needed and any necessary construction and post-construction support. The majority of material in this Manual provides assistance in various technical areas typically encountered, and should be used as a resource whenever necessary.

##### **4.2 Nontechnical Expectations**

Complete success on the job cannot occur unless both the technical and nontechnical aspects of the work are performed well. Probably the most important nontechnical area is professional and effective communication. Poor communication can ruin relationships and jeopardize projects. Geotechnical Engineers must exert the efforts needed to make sure communication, verbal and written, is handled appropriately.

Other important nontechnical areas, which need to be consistently demonstrated in the behavior of Geotechnical Engineers include:

- Reliability
- Courtesy
- Honesty
- Self-Motivation and Discipline
- Team Building/Support
- Decisiveness
- Professionalism

## 5. GENERAL RESPONSIBILITIES

Geotechnical Engineers are responsible for a number of work products, as described in other chapters of this Manual. This Section outlines some of their general responsibilities:

1. Obtaining all background information from designers, including plan sheets showing bridge abutment and pier locations.
2. Coordinating and performing field investigation, including:
  - a. Obtaining Entry Permits.
  - b. Marking borehole locations in the presence of the Field Crew Supervisor. If the Field Crew Supervisor cannot be present, then he/she is to be consulted regarding the borehole location.
  - c. Obtaining utility clearance.
  - d. Verifying that appropriate traffic control arrangements are made.
  - e. Insuring needed sampling tools and equipment are available for drilling work.
  - f. Coordinating activities with Field Crew staff.
  - g. Participating in drilling and/or test pit excavation activities including field testing, soil sampling, logging, and surveying. Insuring drilled holes are properly backfilled after completion.
  - h. Making individual travel arrangements.
3. Requesting tests to be conducted in the laboratory.
4. Analyzing the data from field and laboratory tests.
5. Preparing the Geotechnical Report.
6. Attending meetings.
7. Reviewing Construction Plans and Special Provisions. Making appropriate comments and recommendations by memorandum to necessary parties.
8. Providing construction support to Resident Engineers.
9. Assisting District Engineers in maintenance issues, such as rockfall, slope stability, and soft subgrade problems.

## 6. EMERGENCY WORK

Emergencies can generally be described as those occasions which threaten the life, health, safety or welfare of the public, or State employees. The resolution of the legitimate emergency may involve the Department staff, outside contractors, or a combination thereof. From the perspective of the Geotechnical Engineer, emergency situations are extremely rare, and any expenditure of monies or significant effort in an emergency situation will require the prior approval of the Assistant Chief Materials Engineer.

## 7. TIME USAGE

The contract between the Department and its employees for time usage can generally be described as the requirement for employees to make productive and sensible use of their time, and the Department pays the contracted amount of the monies and benefits to the employee for that time. This contract requires employees to hold all nonproductive time to a minimum.

Cost tracking cannot occur unless time is accounted for correctly. Cost tracking is necessary and important to measure project performance to account for expenditure of monies.

Budgeted and authorized projects are assigned an Engineering Authorization (EA) number. Geotechnical Engineers may only perform project work which has one of these numbers, or authorized overhead. It is also necessary for Geotechnical Engineers to carefully and accurately account for all project work performed by the appropriate EA number. If Geotechnical Engineers are asked to perform work on a project which does not have an approved EA number, they are to refer the matter to the Principal Geotechnical Engineer. If work comes in, the Geotechnical Engineer needs to refer it to the Manager for proper assignment.

### 7.1 Time Sheets

Biweekly time sheets must be completed by all Geotechnical Engineers. Timesheets, and Application and Authorization for Leave cards are covered in the Employee's Payroll Manual. Time sheets are to be completed in a manner, as directed, which accounts for time primarily associated with EA numbers. The need for accurate accounting on projects is twofold. First, it provides the means of determining project costs. Second, it facilitates proper reimbursement to the Geotechnical Section. These are important for documentation, budget preparation, and personnel allocation decisions. **NOTE:** Each employee is assigned an internal identification number to be used on time sheets.

### 7.2 Breaks and Lunch Periods

All Geotechnical Engineers are required to take a one-half to one hour break for lunch when they are working in the field. However, when working in the office, the lunch break will be one hour. This lunch break, depending on the needs of the job is to be taken between the hours of 11:00 a.m. and 1:00 p.m. Breaks are to be taken twice during each shift, and consist of two fifteen-minute periods.

### 7.3 Overtime

The use of overtime is not at the discretion of the Geotechnical Engineer. Overtime must be approved prior to its use. When overtime is needed, the reason for the need, and the estimated amount of time needed, are to be submitted to the supervisor. When overtime needs are encountered in the field, approval is also to be requested of the supervisor. If the

supervisor cannot be reached and the use of overtime is absolutely necessary, it should be held to a maximum of two hours per day, or eight hours per week.

#### **7.4 Requests for Leave**

All requests for leave (annual, sick, etc.) are to be made by completing the “Application and Authorization for Leave” card, and submitting the card to the Principal Geotechnical Engineer for approval. Leave will be granted at the convenience of the Geotechnical Section, and requests must be submitted as far in advance of the time requested as is practicable.

### **8. CLIENT SERVICE**

Geotechnical Engineers must always keep in mind that meeting client needs, and providing a high level of client service, are key factors in successful job performance. Satisfied clients are the main element in achieving usefulness to the organization and personal job security.

A listing of clients with the typical requests/needs follows:

- Resident Engineers – During construction, assistance with construction and inspection problems
- Construction – Assistance with claims from contractors
- Bridge – Provide foundation recommendations
- Attorney General – Right-of-way issues, claims resolution
- Traffic – Provide signal, sign and light foundations recommendations
- Roadway – Provide cut and fill slope inclinations recommendations
- Hydraulics – Revetment, rip rap, and geotextile
- Maintenance – Recommendations for slope and rockfall, roadway/subgrade problems
- Right-of-Way – Permits, analysis of land use
- Field Crews (including contracted crews) – Drilling
- Laboratories – Material analysis issues
- Surveyor – Mapping areas, including aerial photographs and topographical maps
- Environmental – Groundwater
- Other State Organizations/General Public/Consultants – Provide information as requested

Helping customers will require formal and informal methods of correspondence, depending on the nature of the assistance provided. Service of a high level should always be the goal of the Geotechnical Engineer, but this service should also be tempered with the need to account for productive time, as outlined in Sections 2 and 7 of this Chapter.

### **9. CARE AND INVENTORY OF EQUIPMENT**

Geotechnical Engineers will have some equipment assigned to them on a full time basis. Examples could include such items as a personal computer, camera, or cellular telephone. Other equipment items, such as State vehicles, may be utilized as required, when

available. All equipment is to be cared for and maintained appropriately.

The drilling support truck will be used in this Section as an example of the proper care and inventory of equipment. However, all equipment, whether assigned permanently or on a temporary basis, will be given the proper care described here.

The drilling support truck will be operated in a safe, courteous manner, in accordance with the policies described in Chapter 2, "Operation of NDOT Motor Vehicles." The truck and its included equipment are to be returned clean and ready for the next assignment. If the fuel tank is less than three-quarter full, the truck is to be fueled. Any maintenance or safety issues with the truck are to be reported immediately to Motor Pool. Likewise, any items of equipment stolen or broken are to be reported immediately. If the truck is dirty, it is to be washed.

Of particular importance is the requirement to order inventory items for the truck, when such items are consumed or damaged in the course of work. Notes should be taken as such items need replacement, and these items are to be ordered immediately upon returning the truck. The form to be used to keep track of inventory items is the "Inventory List" form.

## **10. WRITTEN CORRESPONDENCE**

The various forms of written correspondence, along with policies governing their use, are discussed in this Section. Different types of correspondence and their appropriate use for given situations are also covered.

As a general rule, written correspondence should be as brief as possible, but also needs to deal comprehensively with the subject matter. This means beginning the writing by explaining the purpose of the correspondence. An example would be to indicate that certain information was requested, and that the information is given in the correspondence. Also included should be the necessary facts, such as a description of the problem and the solution, if requested. The solution or recommendation should normally also include the various other options, when possible, along with their respective advantages and disadvantages, and how effective each option would be.

Not all correspondence requires a specific recommendation. However, sometimes a recommendation is necessary. An example of where a recommendation must be provided would be when one is specifically requested by a Resident Engineer on a problem encountered on a project which has a contract number.

Written correspondence falls into the categories of formal and informal. Letters, memorandums, some emails, and reports are formal correspondence. Transmittal forms, some facsimiles and most emails are informal correspondence. Formal correspondence must be placed in a computer file, backed up on an intranet server, and placed as a hardcopy in the Project file.

Color copying, and all other copy work done by the Section in large quantities, or if charged to an EA or Contract number, is to be facilitated by the author of the correspondence through Reproduction (see this Chapter, Section 11, "Printing Requests").

Finally, all correspondence should be processed in a timely manner.

With the exception of reports, which are dealt with in other sections of this Manual, policies regarding the various types of written correspondence are detailed below.

### **10.1 LETTERS**

Letters are used as formal, written correspondence to parties outside of the Department. All letters are to be composed utilizing official letterhead under the name of the Principal Geotechnical Engineer or Assistant Chief Materials Engineer.

### **10.2 MEMORANDUMS**

Memorandums are the most common form of formal, written correspondence utilized when the correspondence is internal to the Department. All memorandums will be formatted using the standard memorandum template, as approved by the Chief Materials Engineer, Materials Division. See Figures 3-1 and 3-2 at the end of this Chapter.

### **10.3 MEMORANDUM AND LETTER DISTRIBUTION**

All memorandums are to be prepared for signature by the Assistant Chief Materials Engineer or Principal Geotechnical Engineer. All project managers are to receive a copy of these memorandums. After signature by the Assistant Chief Materials Engineer or Principal Geotechnical Engineer, the original of the memorandum or letter is to be sent to the Administration Section of the Materials Division for filing and distribution. Typically, this is satisfied by placing the original copy in the Administrative Professional Secretary's in-basket. The Professional Secretary will make four copies and send the original to the addressee. The copies will go to the Department central file, the Materials Division file, the Carson City docket and the Las Vegas docket.

The author of the correspondence is then to make and distribute five copies of the letter or memorandum as follows:

- Assistant Chief Materials Engineer
- Principal Geotechnical Engineer, two copies
- Geotechnical Section Project file
- Personal file of the Geotechnical Engineer

The proper distribution of letters and memorandums is critical in achieving necessary documentation, getting information to the appropriate parties, and for ease of research at a later date.

### **10.4 TRANSMITTAL FORMS**

The Transmittal log, Figure 3-3, is a copy of a transmittal form that can be used for sending documents to the other divisions. The Write It Don't Say It form, Figure 3-4, can be

used for internal or Department information communications, but must not contain any geotechnical recommendations. These two types of forms are available for use when very little information needs to be stated. Formal communications and those containing geotechnical recommendations are discussed in Section 10.1 above.

### **10.5 Facsimiles**

Facsimiles (faxes) are an informal method of written correspondence which are appropriate to use when the number of documents being sent is small, and speed of submittal is of benefit. It should be remembered that facsimiles do not provide a record of receipt and action other than a confirmation of delivery. However, if needed, the Geotechnical Engineer can request that the recipient return the cover sheet acknowledging receipt and noting the number of pages received. A printout of the first page showing successful delivery is printed by the fax and needs to be kept in the Project file. All memorandums, recommendations and approvals need to be followed up with a hard copy through the mail.

### **10.6 Email**

Email is another common form of written correspondence. Examples of appropriate use of email for written correspondence are setting up meetings and answering simple requests, where a recorded recommendation is not necessary. When email is used as a type of formal correspondence, the same rules apply as for other forms of written correspondence. Emails with formal correspondence need to be followed up with a hard copy through the mail.

## **11. PRINTING REQUESTS**

Printing requests are handled with the use of the "Reproduction Job Request Form." This form must be completed in detail, including a full job description, to make sure the request is fulfilled accurately and in a timely manner.

The most significant printing requested by Geotechnical Engineers will be Geotechnical Reports. Prior to submitting these reports for printing, they must be approved by the Principal Geotechnical Engineer. The Geotechnical Engineer is required to make certain these reports are formatted properly and that necessary items are included, such as the State seal.

## **12. SUPPLIES AND EQUIPMENT REQUESTS**

All new and replacement supplies and equipment provided by the Department are for business use only, and may not be utilized for personal use.

Before ordering any supplies or equipment, a thorough check of the stockroom and the office supplies cabinet is necessary to make sure the item is not in stock. If the item is not in stock, but is needed in the performance of the job, the first step is to communicate with the Principal Geotechnical Engineer to receive approval to request the item.

After Principal Geotechnical Engineer approval, the "Combination Request for Supplies, Equipment and Shipping Record" form is to be completed. This form must contain specific

information, to include accounting information, quantity, stock or model number, detailed description, proposed supplier information (if known), etc.

The form is then given to the Administrative Professional Secretary for completion. Sufficient time must be given for the request to be ordered and delivery accomplished. If equipment is needed, and the price exceeds \$1000, it must be approved in the budget prior to completing this form. Such requests are first to be discussed with the Principal Geotechnical Engineer.

### **13. BUDGET REQUESTS**

It has been emphasized in various places in this Chapter that monies can only be expended when they are specifically authorized in the budget. Therefore, the budget process is a very important tool which is utilized to plan programs, activities, and specific supplies and equipment needs.

Budget requests are normally due to be finalized in the Geotechnical Section very early in the calendar year. Consequently, planning for requests needs to occur by the end of the preceding calendar year. Each year, specific due dates will be given for budget requests.

Typical budget request categories include computer equipment and software, training, equipment, highway construction aids, summer intern students, and Consultants.

When Geotechnical Engineers identify potential budget requests, they should discuss them with the Principal Geotechnical Engineer.

### **14. TRAVEL**

The Department provides travel for employees to facilitate the accomplishment of their work, and to allow training to improve productivity which cannot be obtained in another manner. With few exceptions, travel must have prior authorization.

There are two primary written policies to follow concerning travel.

The first is NRS 281.160. This Statute provides various policies, reimbursement rates and details on travel advances.

The second is TP 1-5-12. This TP establishes detailed procedures for travel. The TP also discusses the various authorizations required for in-state and out-of-state procedures, travel advances, reimbursement rates (note: these rates will be modified on occasion), various forms required, use of private vehicle, air transportation, motor pool and rental vehicles.

In addition to complying with the above, the Geotechnical Engineer, when requesting travel, must provide the following to the Administrative Assistant:

- A justification for the request
- The account to charge, such as EA number
- The schedule
- Any vehicle arrangements
- Travel Advance Form, if desired.

➤ Travel Claim Form (including applicable receipts)

When local travel is required, a vehicle may be checked out from the Motor Pool. All Motor Pool procedures must be carefully followed. Since there are a limited number of vehicles, availability is not guaranteed.

In some instances, the use of a personal vehicle will be allowed. Mileage reimbursement will be provided when a personal vehicle is utilized for necessary Geotechnical Section travel. Use of a personal vehicle, under these circumstances, must have prior approval of the Principal Geotechnical Engineer, and comply with all applicable policies and procedures. Reimbursement for personal vehicle mileage is processed after the travel.

## 15. TRAINING

The Geotechnical Section management supports the continued training of Geotechnical Engineers to provide for professional growth and to keep pace with technical and technological changes.

Geotechnical Engineers are responsible for helping management identify needed resources for training opportunities, and to take full advantage of any training attended.

## 16. EMPLOYEE APPRAISALS

Employee appraisals, or employee development reports, are an important method of formalized communication between the supervisor and employee. The appraisals process provides for necessary evaluation and feedback. Geotechnical Engineers may be called upon to mentor junior engineers, and provide assistance in preparing employee appraisals.

The appraisal form, used for all regular employees of NDOT, is the "Department of Personnel Employee Appraisal & Development Report." This form provides for the appraisal to be modified for individual job duties, and is formatted to describe the principal assignments of the employee, and rate them, to provide a summary rating of related factors, to provide comments related to the ratings, and for the supervisor to provide a developmental plan and any other suggestions. The form is also used to provide for merit increases and to accomplish the completion of probationary periods. Appraisals of employees are required at three, seven, and eleven months, during probationary periods, and once per year thereafter. All appraisals are to be discussed between the supervisor and employee, and become part of the employee's personnel record.

The policies and procedures relating to appraisals can be found in TP 1-6-17.

As noted, Geotechnical Engineers may be a mentor to three categories of employees. The first of these is the Rotational Engineer. The second category is that of Highway Construction Aide. The last category is that of Student Intern.

## 17. ETHICAL GUIDELINES

NDOT currently has no formal policy covering the matter of ethical considerations. Also, no ethics policy could be written to deal with all possible situations. Nor does this Section

attempt a comprehensive discussion of ethics matters. Rather, the purpose is to make the Geotechnical Engineer aware that decisions regarding ethics have to occasionally be made in the work environment. Such decisions must be made with an understanding of, and appreciation for, the need to always demonstrate the very highest ethical behavior.

While there is no detailed ethics policy, a few common sense rules will always apply:

- Accept no gifts from anyone doing business with, or seeking to do business with NDOT
- Avoid any real or potential conflicts of interest
- Always be professional and honest in personal contacts, and written reports and recommendations

Finally, if any situation occurs where the decision on what to do is not clear, in terms of ethical considerations, always make the decision based on the assumption that there is a possible ethics breach.

## **18. JOB SITE SAFETY**

Policies and procedures relating to the general aspects of safety are discussed in Chapter 5. However, particular attention should be given to the various job sites, where unsafe conditions tend to more commonly occur. These conditions may relate to the job site conditions, or the practices of individuals working at the job site.

When unsafe job site conditions are encountered, the Principal Geotechnical Engineer and the appropriate on site individual are to be notified immediately. If the unsafe conditions relate to maintenance issues, such as a large rock in the roadway, the Maintenance Division is to be immediately notified.

The reporting of unsafe job site conditions does not end upon proper notification. The Geotechnical Engineer should also document these incidents. This documentation should be placed in the Project file, depending on the nature of the incident.

Geotechnical Engineers should also be vigilant in following appropriate safety practices, and wearing necessary protective gear, particularly during drilling operations. More information on drilling safety is provided in Chapter 5, "Safety Guidelines."

## **19. JOB SITE HAZARDOUS MATERIALS**

The procedures, policies and training for the general aspects of hazardous materials may be found in Chapter 2, "Hazardous Materials," and also Chapter 5, "Contaminated Sites." It is the policy of the NDOT Geotechnical Section to not perform hazardous materials drilling, testing or evaluation. When contaminated conditions are encountered, the normal practice is to employ a Consultant to provide the needed services.

When Geotechnical Engineers know of, or suspect, hazardous materials contamination at the job site, they are to inform the Principal Geotechnical Engineer immediately and cease any further drilling, testing or evaluation.

## **20. JOB-RELATED INJURIES**

If an injury occurs while on the job, it must be reported as soon as possible to the Principal Geotechnical Engineer, or a higher level. There are also specific procedures and forms required concerning job-related injuries. These are discussed in Chapter 2, "Safety in the Workplace." It is the responsibility of Geotechnical Engineers to comply with all policies and procedures regarding job-related injuries, including required reporting time frames. Failure to do so can have significant impacts, including the possibility of being ineligible for worker's compensation, or other job benefits.

Current telephone numbers are available at the Materials Division office to call for approved occupational medicine providers and pharmacies, should a job-related injury occur. However, in the event of a medical emergency, help should be sought at the nearest medical facility.

## **21. VEHICLE ACCIDENTS**

This Section deals with the procedures to follow in the event of an accident while driving an NDOT vehicle. Additional discussion regarding NDOT vehicle operation may be found in Chapter 2, "Operation of NDOT Motor Vehicles."

If an accident occurs, while operating an NDOT vehicle, the first responsibility is to provide for assistance to any injured parties, and to seek immediate help for yourself, in the event of injury.

The second responsibility is to notify the Principal Geotechnical Engineer, or a higher level, about the specifics of the accident, and complete a "Vehicle Accident Report" form. This form requires information about you, your vehicle, other persons and vehicles involved in the accident, witnesses, and persons injured. The glove compartment of NDOT vehicles should contain copies of this form.

Another form utilized in conjunction with an NDOT vehicular accident is the "Supervisors Vehicle Accident Investigation." This form is completed by the employee's supervisor, and is an investigation and listing of action taken. Comments and recommendations are made by the District Operations Instructor. Any actions taken are noted by the District Engineer or Division Head, with the requirement that the employee sign the form. There is also a review and findings made by the General Safety Committee.

## **22. LOSS REPORTING**

In the event of loss or damage of NDOT materials or equipment by theft, pilferage or vandalism, it is the responsibility of the Geotechnical Engineer to notify the Principal Geotechnical Engineer, or higher level immediately. When appropriate, local police authorities will also be notified by the Geotechnical Engineer, and full and complete details given of the items missing or damaged, along with any other pertinent facts concerning the incident.

### **23. COMPUTER SOFTWARE TOOLS**

Various forms of computer software tools are made available in the Geotechnical Section. It is the responsibility of the Geotechnical Engineers to become familiar with the different types of software provided, and to utilize the software to increase productivity and communicate effectively. The software tools currently available are included as Figure 3-5. All new employees must have a processed "NDOT Request for Computer Access" form.

### **24. REFERENCE MATERIALS**

Various reference materials are available in the Geotechnical office. These materials are valuable to the Geotechnical Engineer when seeking additional information. Some reference material is provided to the Geotechnical Engineers when they first start the job. The Geotechnical Section has a library with many reference books and literature.

### **25. GEOTECHNICAL LABORATORY**

Laboratory testing is performed by the Geotechnical Laboratory. The Geotechnical Engineer is responsible for requesting appropriate laboratory tests, while being mindful that unnecessary testing is a waste of assets, resources, and personnel time, and could delay projects.

Requests for laboratory work are accomplished through the use of a two-part form, "Nevada Department of Transportation Geotechnical Lab Task Sheet," which is to be completed for each project. More information on laboratory tests, and samples of the form, may be found in Chapter 8, "Laboratory Tests."

**26. FIGURES****3-1: Memorandum****STATE OF NEVADA  
DEPARTMENT OF TRANSPORTATION****MEMORANDUM**

December 27, 2002

**To:** Tim Ruguleiski, Resident Engineer  

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**From:** ~~for~~ Jeff Palmer, Principal Geotechnical Engineer *TPM*  
**Subject:** Contract 3110, US 95 Widening at Valley View in Las Vegas, Review of CSL, Reports No. 3 and 4

The Geotechnical section has reviewed the Crosshole Sonic Logging (CSL) Reports No. 3 & 4, for the Valley View Bridge over US 95.

Report No. 3 presented CSL, test information for five drilled shaft foundations (piers): Piers 1, 2, 4, and 7 in Abutment 1; and Pier 4 in Abutment 2. Of these five piers, all showed test results indicative of good quality concrete, except for Pier 2. This pier showed a velocity reduction of 18% in two spots of one tube pair (between 33.5 and 34.0 meters; and between 27.0 and 37.5 meters).

Report No. 4 presented CSL, test information for six drilled shaft foundations (piers): Piers 1, 2, 3, 5, 6, and 7 in Abutment 2. Of these six piers, only three piers showed test results indicative of good quality concrete throughout the shaft. Pier 1 showed velocity reduction of between 12% and 29% in five pairs of tubes between 34.5 and 36.5 meters. Pier 3 showed velocity reductions of between 23% and 30% in two pairs of tubes between 36.0 and 37.0 meters. Pier 5 showed a velocity reduction of 16% in one tube pair between 34.5 and 37.0 meters.

These zones of reduced velocity are indicative of anomalous zones within the concrete shaft. Because of these anomalous zones, both the skin resistance and the end bearing capacity of these shafts have been reduced. It is difficult to determine the actual amount of capacity reduction such anomalies produce and the resulting reduction in the design safety factors. Based on previous experience and conversation with the Consultant designer, Walter Vanderpool of Terracon, Inc., the reduction in capacity and factors of safety are determined to be acceptable. We recommend accepting the shafts.

It is our strong recommendation to notify the contractor(s) responsible for the shaft construction of the existence of these anomalies and further, to examine and improve their technique for ensuring the cleanliness of the excavations. This step is needed to ensure compliance with the specifications as set for the in the NDOT Standard Specifications for Road and Bridge Construction.

If you have any questions or require further information, please call Dana Boomhower at 888-7870, or me at 888-7873.

**JP:DB:db****c:** John Terry, Project Manager

**3-2: Memorandum****STATE OF NEVADA  
DEPARTMENT OF TRANSPORTATION****MEMORANDUM**

February 12, 2002

To: Nancy Kennedy, Principal Bridge Engineer

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From: Jeff Palmer, Principal Materials Engineer - Geotechnical

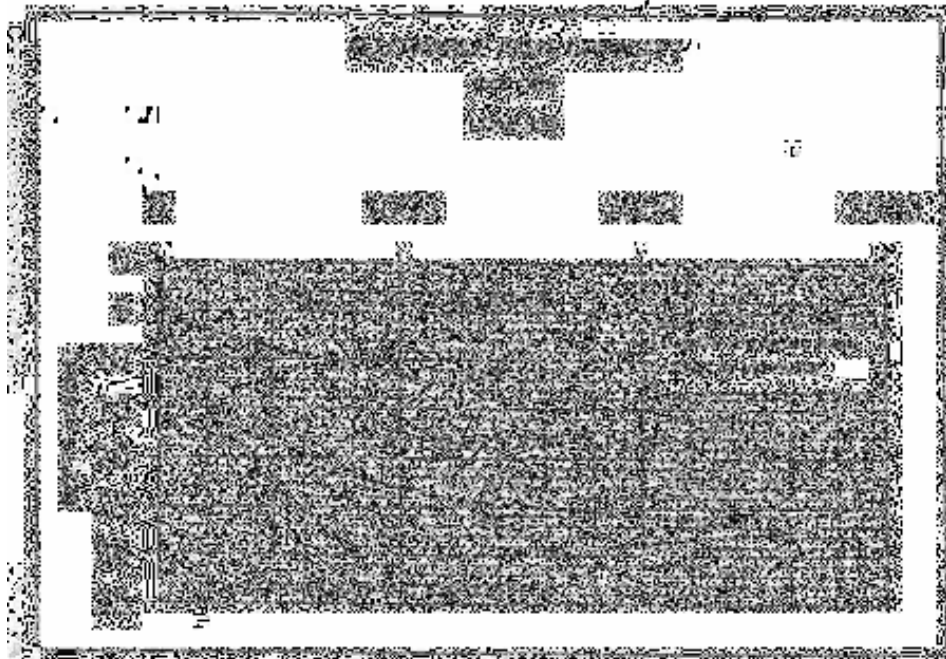
Subject: Geotechnical Report – Preliminary Recommendations JP

Pembroke Drive Bridge (B-1691) over Steamboat Creek – Washoe County

EA 72648

The following design recommendations are provided for the Pembroke Drive Bridge Project prior to the completion of the Geotechnical Report.

Analysis of the subsurface site conditions and laboratory test results enabled us to calculate bearing capacities for the 460 mm steel pipe piles shown in the 60% plans. These capacities are shown on the following chart. Construction control methods shall include dynamic testing with wave equation analysis, which provides a recommended factor of safety of 2.25. The required pile capacity of 468 kN, provided by the bridge division, is met by using pile 10 meters in length. Pile uplift capacity is 105 kN per pile, and 735 kN per pile group.



**3-3: Transmittal Log**

Date: \_\_\_\_\_

**To**

**From**

\_\_\_\_\_

\_\_\_\_\_

**Telephone Number:**

\_\_\_\_\_

\_\_\_\_\_

For  Action  Approval  Information  
Your  Comments  Signature  Review  FYI

- As We Discussed
- Per Your Request
- Please Return Attached Material
- Please Prepare a Reply to be signed by \_\_\_\_\_
- Please See Me

Remarks: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**3-4: Write It... Don't Say It!**

STATE OF NEVADA  
DEPARTMENT OF TRANSPORTATION  
**WRITE IT... DON'T SAY IT!**  
INTERDIVISION COMMUNICATION

To: \_\_\_\_\_ Date: \_\_\_\_\_  
From: \_\_\_\_\_ Reply Wanted: \_\_\_\_\_  
Subject: \_\_\_\_\_ No Reply Wanted: \_\_\_\_\_

Message, without recommendations:

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### 3-5: Computer Software Tools

Microsoft Word  
Microsoft Excel  
Microsoft Binder  
Microsoft Outlook  
Microsoft PowerPoint  
Microsoft Access  
Mathcad  
Xstabl  
Comp 624P  
GRL WEAP  
gINT  
GEOSYSTEM for Windows  
Grapher  
ProShake  
Rock Database Management Program  
Goldnail  
Driven  
CBEAR  
Microstation  
LPILE Plus  
Group  
Apile  
TZPile  
Shaft  
MSEW  
Civil Tech Suite (Epres, Heave, Lpres, Shoring)  
Rockpack: Rock Slope Stability Analysis  
3D TOPOQUADA: Quads for Nevada  
FOSSA