
Case Studies
KEEP
CALM
AND
TRUST
A Geotechnical Engineer
How to write a Geotechnical investigation report ?


بسم الله الرحمن الرحيم
In the Name of Allah
The Benificent
The Merciful
Designed By:
AfzaaL M.
HD Videos & HQ Images Inspiration



How to write a Geotechnical investigatio report ? (Case Studie)

By : Mohammad Reza Nabizadeh
Prof. Nader Shariatmadari

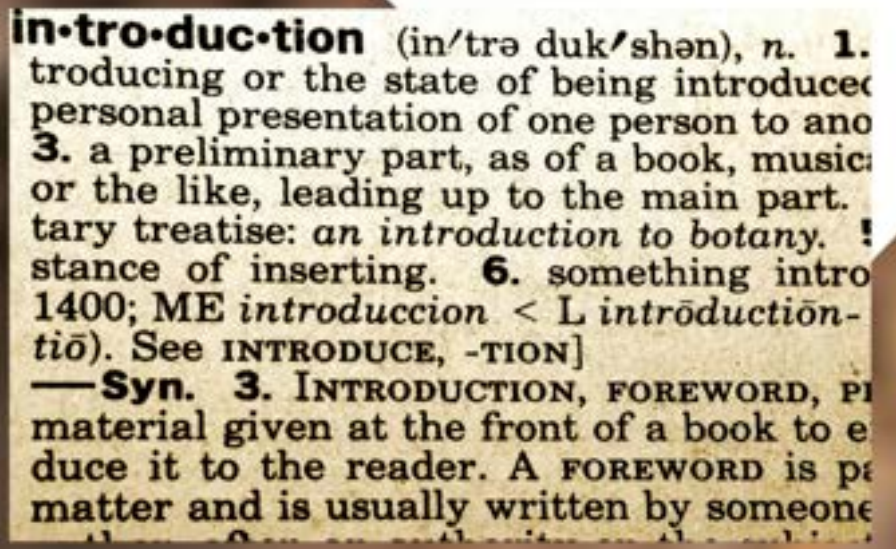
Spring 20


4.Physical Setting
7. Geotechnical Conditions
Content
Introduction
How to write a Geotechnical investigation report ?


Content
Introduction
• The Geotechnical Design Report documents the project site subsurface geotechnical conditions and are usually based on the results of subsurface exploration drilling.
• As a final design report,the Geotechnical Design Report will document the anticipated subsurface conditions based upon field exploration, testing, and analyses.


Content
• Introduction
• Parts of the report
• Format of the report
• Introduction
• Existing Facilities and Proposed Improvements
• Pertinent Reports and Investigations
• Physical Setting
• Exploration
• Geotechnical Testing
• Geotechnical Conditions
• Geotechnical Analysis and Design
• Material Sources
• Material Disposal
• Construction Considerations
• Recommendations and Specifications
• Appendix
• Case Studies

Introduction


in•tro•duc•tion (in′trə duk′shən), *n.* **1.** troducing or the state of being introduced personal presentation of one person to ano **3.** a preliminary part, as of a book, music or the like, leading up to the main part. tary treatise: *an introduction to botany.* stance of inserting. **6.** something intro 1400; ME *introduccion* < L *intrōductiōn- tiō*). See INTRODUCE, -TION]
—**Syn. 3.** INTRODUCTION, FOREWORD, P material given at the front of a book to e duce it to the reader. A FOREWORD is p matter and is usually written by someone

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Format of The Report

i. Title Sheet

The first page of the Geotechnical Design Report will be a **title sheet** containing all the information necessary to identify the report and locate the project. Show:

- The **title**
- The project **title**
- Complete, standard project identification
- The **date** the report was issued
- The **name of the office** in Geotechnical Services responsible for preparing the report
- If prepared by a consultant, the consultant's company **name, address** of the office that prepared the report, **telephone number** and the consultant's project number



ii. Letter of Transmittal

- **Immediately** following the title sheet, include a transmittal letter **addressed to the Division Chief,** Office Chief, or Branch Chief of the district that requested the report.
- The **date of the letter should match that of the title sheet.**
- The transmittal letter **shall identify the project.**



iii. Table of Contents
iv. List of Figures
v. List of Tables

- In a **Table of Contents,** show the starting page number for each section and subsection in the report.
- Provide a **list of all figures** used in the body of the report. These include vicinity maps, location maps, photographs, charts, flow diagrams, graphs, etc.
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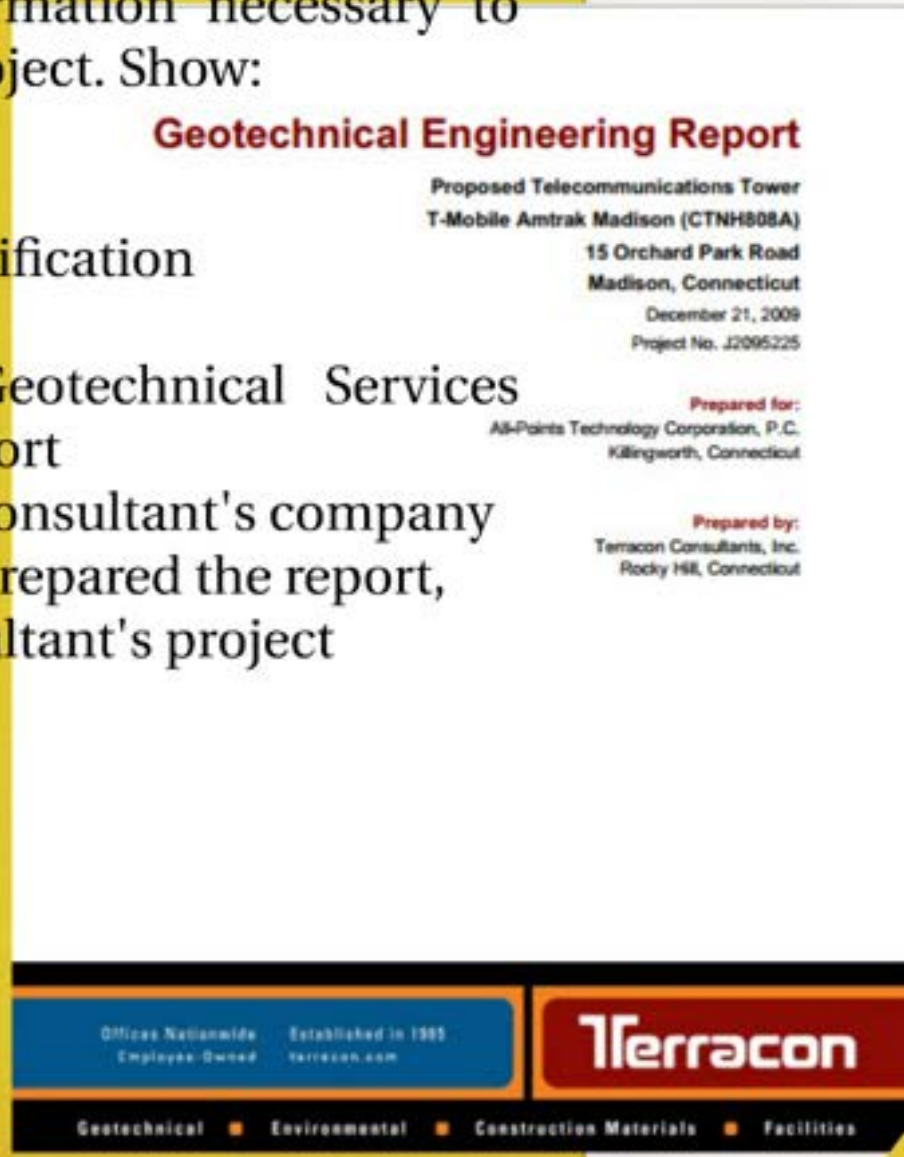

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ENGEO INCORPORATED

GEOTECHNICAL
ENVIRONMENTAL
WATER RESOURCES
CONSTRUCTION SERVICES

Project No.
8924.000.000

March 26, 2010

Eric Chernisz
Solargen Energy, Incorporated
2400 Stephen Creek Boulevard, Suite 700
Cupertino, CA 95014

Subject: Panoche Valley Solar Farm
San Benito County, California

GEOTECHNICAL REPORT

Dear Mr. Chernisz:

ENGEO prepared this geotechnical report for the Panoche Valley Solar Farm as outlined in our agreement dated February 19, 2010. We characterized the subsurface conditions at the site to provide the enclosed geotechnical recommendations for design.

Our experience and that of our profession clearly indicates that the risk of costly design, construction, and maintenance problems can be significantly lowered by retaining the design geotechnical engineering firm to review the project plans and specifications and provide geotechnical observation and testing services during construction. Please let us know when working drawings are nearing completion, and we will be glad to discuss these additional services with you.

If you have any questions or comments regarding this report, please call and we will be glad to discuss them with you.

Sincerely,

ENGEO Incorporated

Paul J. Cottingham, CEG
Senior Geologist

Mark M. Gilbert, GE
Principal

Jonathan C. Boland, GE
Senior Engineer

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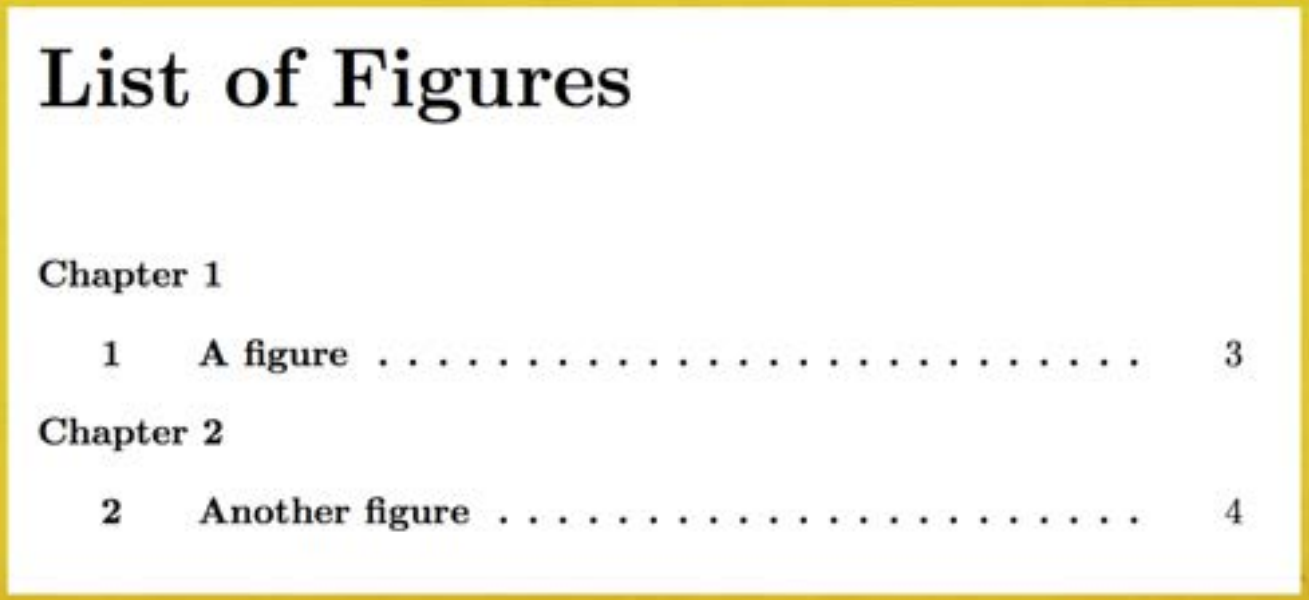


List of Figures

Chapter 1

1 A figure 3

Chapter 2

2 Another figure 4

Main parts of the report

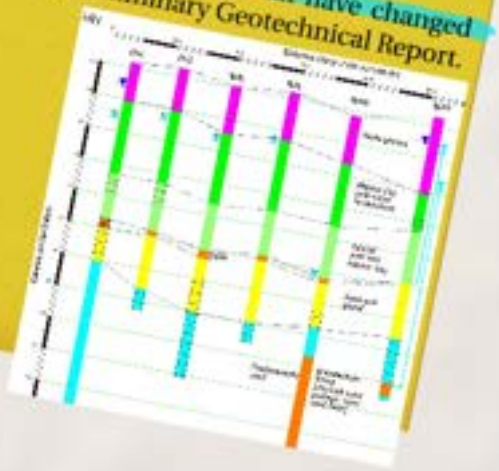
1.Introduction

- Open this section of the report with a **brief description** of the proposed project and the scope of the geotechnical services that were performed:
- **Identify the location** and type of proposed project and describe the type of **facility being proposed**.
- Note the **investigative techniques** and exploration methodology used



2.Existing Facilities and Proposed Improvements

- **With the aid of a Site Plan**, describe the **proposed** improvement.
- Also describe depths/heights, thicknesses and slope **ratios of proposed cuts and fills.**
- Describe existing facilities that may be relevant to the proposed improvement.
- Document **any project or site details that have changed** since preparation of the Preliminary Geotechnical Report.



3. Pertinent Reports and Investigations

- List **additional reports** that pertain to this project.
- Include information describing authorship and dates of completion.
- Document the **literature used** in researching the geotechnical conditions for this project.
- The literature may be :
  - **Geologic maps,**
  - **Topographic maps,**
  - **Aerial photographs,**
  - **Previously completed reports** for this or adjacent projects,
  - **Regional geology reports,**
  - **"As-built" plans,**
  - **Construction completion reports,**
  - or others.



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- Identify the location and type of proposed project and describe the type of facility being proposed.
- Note the investigative techniques and exploration methodology used



Solargen Energy, Incorporated 8824.000.000
Panoche Valley Solar Farm March 26, 2010

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

ENGEO prepared this geotechnical report for design of the Panoche Valley Solar Farm in San Benito County, California. We prepared this report as outlined in our agreement dated February 19, 2010. Solargen Energy authorized ENGEO to conduct the scope of services outlined below:

- Service Plan Development
- Subsurface Field Exploration
- Soil Laboratory Testing
- Data Analysis and Conclusions
- Report Preparation.

For our use, we received the following:

1. RFQ, POWER Engineers, delivered via email on February 4, 2010.
2. Electronic site plan, POWER Engineers, delivered via email on March 2, 2010.
3. Panoche Valley Solar Farm Initial Study, POWER Engineers, dated August 2009.

This report was prepared for the exclusive use of our client and their consultants for design of this project. In the event that any changes are made in the character, design or layout of the improvements, we must be contacted to review the conclusions and recommendations contained in this report to determine whether modifications are necessary. This document may not be reproduced in whole or in part by any means whatsoever, nor may it be quoted or excerpted without our express written consent.

1.2 PROJECT LOCATION

Figure 1 displays a Site Vicinity Map. The site is located in Panoche Valley situated in the Coast Ranges approximately 43 miles southeast of Hollister via Panoche Road and approximately 16 miles west of Interstate 5 via West Panoche Road.

Figure 2 shows site boundaries, proposed improvement areas, geology, as well as our exploratory locations. The 5000-acre site occupies the majority of the Panoche Valley north of Panoche Road. Little Panoche Road trends north-south bisecting the site. The site is generally bordered by mountains to the east and west. The southern portion of the site is generally bordered by flat cattle grazing land.

Panoche Valley, looking northwest

ENGEO

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- With the aid of a Site Plan, describe the proposed improvement.
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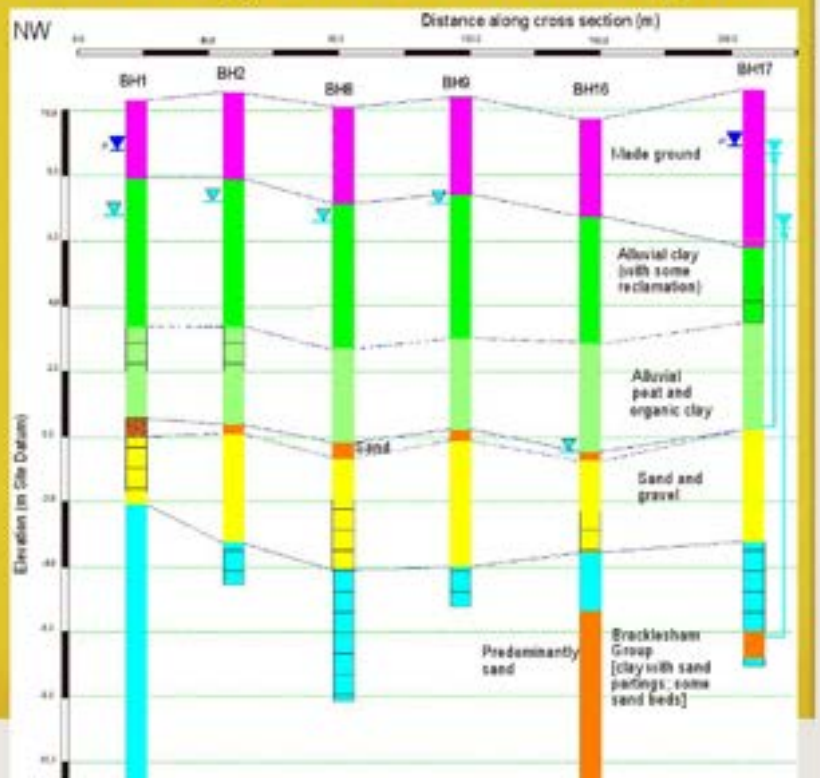





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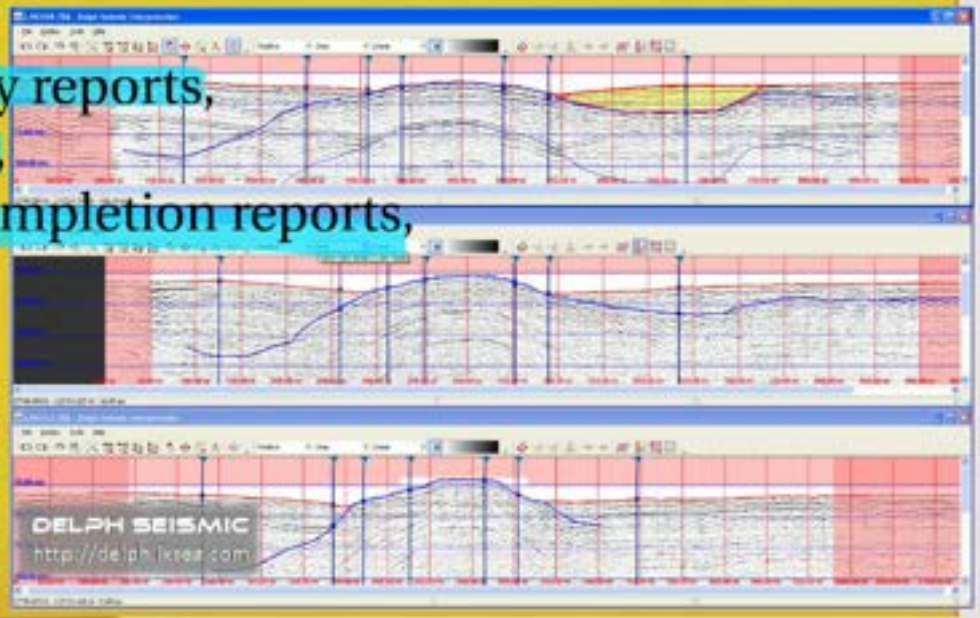
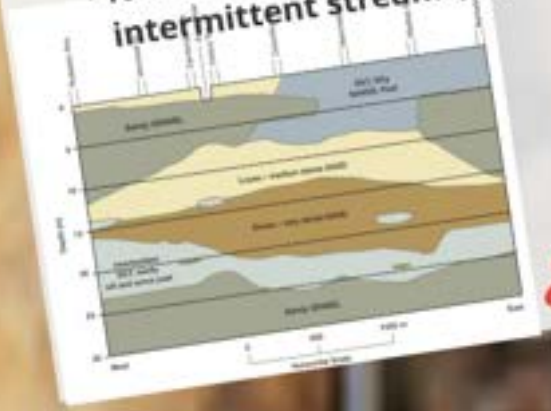


4.Physical Setting

- 4.1. Climate Describe :
  - climatic conditions that will have an effect on the project design.
  - Present the range of temperatures in the vicinity of the project
  - Note average annual rainfall in inches
- 4.2. Topography & Drainage :
  - Describe the topography and the drainage patterns through which the project will pass.
  - Note drainage patterns including creeks, intermittent streams, and rivers



4.Physical Setting

- 4.3. Man-made and Natural Features of Engineering and Construction Significance :
  - At times, the project may abut or parallel certain features that, although outside the proposed right of way, could be adversely affected by the project.
- 4.4. Regional Geology and Seismicity :
  - Describe the regional geologic setting of the project area.
  - Describe the regional seismic setting, including names of known active faults, distances and directions from the project site, and maximum credible earthquake magnitudes
- 4.5. Soil Survey Mapping :
  - Discuss soil survey mapping, if any, used to further characterize the project location.

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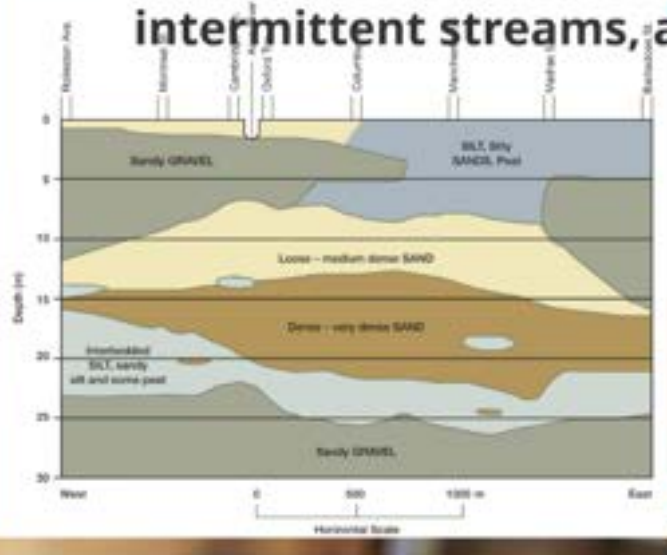

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5. Exploration

- In this section of the Geotechnical Design Report, describe what was done during the field investigation.
- Include a summary description of the type, scope, and purpose of the field investigations.
- Include a section on problems encountered during the exploration program which may have design or construction implications.
- Drilling and Sampling :
  - Briefly describe the number, type and depths of borings, trenches andtest pits made for the field study.
- Geologic Mapping
  - On the map, show the layout of the proposed project



Exploration Types

- Geophysical Studies
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- Instrumentation
  - Describe any instrumentation installed during the field exploration
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6. Geotechnical Testing
6.1. In Situ Testing

- Describe the in situ testing performed for the subsurface exploration program.
- Reference the test methods used.
- Include modifications of existing test methods or unpublished test methods in the appendix.
- Explain why that method was used instead of a published method.
- Include the data and examples of necessary calculations in the Appendix.



6. Geotechnical Testing
6.2. Laboratory Testing

- Describe laboratory testing performed for this report.
- Include a listing of the testing performed such as consolidation tests, triaxial tests, Atterberg Limit tests, mechanical analyses, etc.
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7. Geotechnical Conditions

- Drawn from field observation, literature study, instrumentation, exploration, testing and professional judgment, this section presents the geotechnical and ground water conditions assigned for use in analysis and design.
- 7.1 Site Geology :
- Describe the geology of the project site and an area surrounding the project site sufficiently large to include geologic features of potential significance to the project.
  - 7.1.1. Lithology
  - 7.1.2. Structure
  - 7.1.3. Natural Slope Stability



7. Geotechnical Conditions

- 7.2. Soil and Ground Water Conditions
- Summarize the existing soil and ground water conditions based on information from the boring logs, in situ tests, and laboratory tests.
- 7.3. Water
- In this section of the report, describe surface and ground water conditions which might have an impact on project design or construction.
  - 7.3.1. Surface Water
  - 7.3.2. Ground Water
- 7.4. Project Site Seismicity
  - 7.4.1. Ground Motions
  - 7.4.2. Ground Rupture



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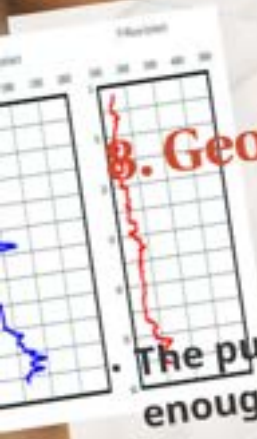


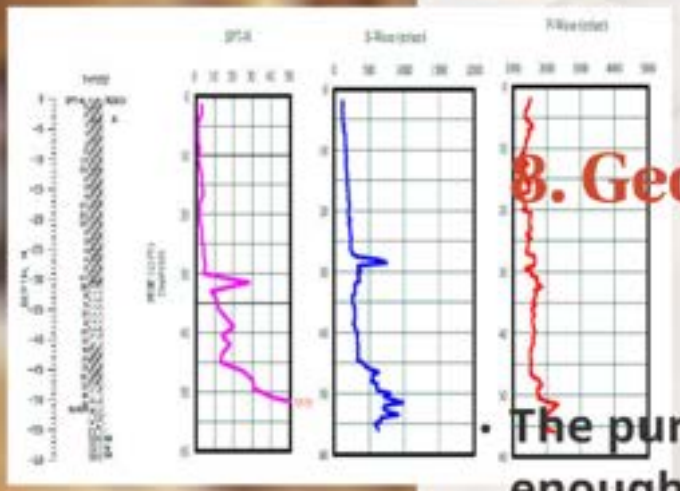
8. Geotechnical Analysis and Design

- The purpose of this section is to provide enough supporting analyses, computations, reasoning and discussion so that the basis for the geotechnical conclusions is clear to the reader.
- 8.1. Dynamic Analysis :
  - 8.1.1. Parameter Selection
  - 8.1.2. Analysis
- 8.2. Cuts and Excavations
- 8.3. Embankments
- 8.4 . Earth Retaining Systems
- 8.5. Culvert Foundations
- 8.6. Minor Structure Foundations

9. Material Sources
10. Material Disposal

- In general, location, testing, analysis, discussion, and preparation of factual data tabulations for materials sources will be done by the District Materials Engineer.
- For projects with a potential surplus of material (net export projects), note on-site or nearby disposal sites, along with any geotechnical constraints on their use.





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11. Construction Considerations
12. Recommendations and Specifications

- 11.1. Construction Advisories
  In this section provide geotechnical information that might be of use in deciding how to bid and how to construct the project.
- 11.2. Construction Considerations that Influence Design
- 11.3. Construction Considerations that Influence Specifications
- 11.4. Construction Monitoring and Instrumentation
- 11.5. Hazardous Waste Considerations

13. Appendix

- 13.1. Geologic and/or Location of Borings Map
- 13.2. Geologic Cross-Sections & Soil Profiles
- 13.3. Profile Grade Sheets
- 13.4. Boring Legend
- 13.5. Boring Logs
- 13.6. Logs of Test Borings
- 13.7. Geophysical Data
- 13.8. In Situ Test Data
- 13.9. Laboratory Test Data
- 13.10. Corrosion Test Reports
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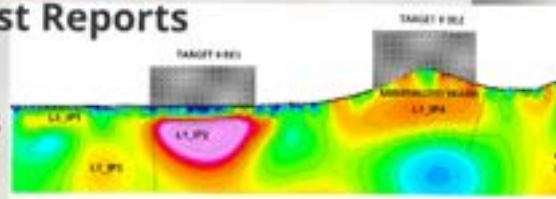

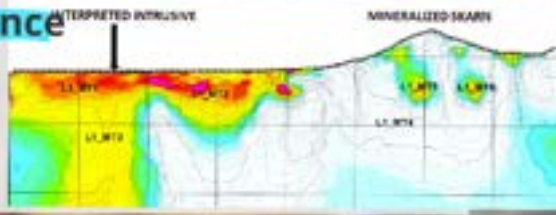

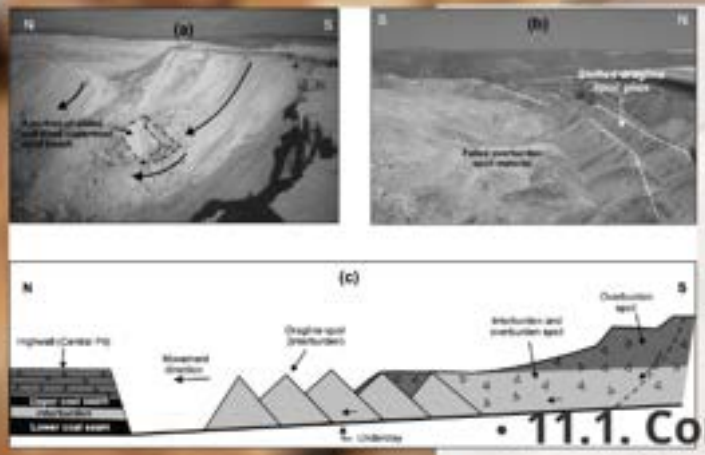

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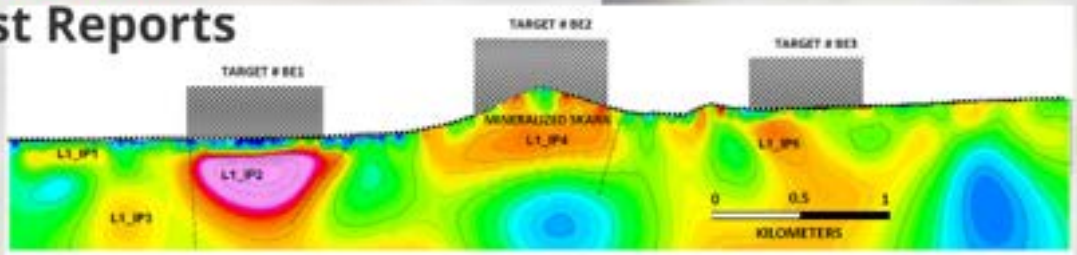




Case Studies


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