



NATIONAL PETROCHEMICAL COMPANY
STANDARDS

ENGINEERING STANDARD
FOR
GEOTECHNIC

NPCS-ES-GC-01

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1 GENERAL

1.1 SCOPE

This standard covers the minimum requirements for soil investigation of a petrochemical complex. The scope and procedures to be employed in any soils or foundation investigation are dependent upon the soil conditions, which may vary from simple to extremely complex, the requirements of the structure, legal requirements, construction procedures and problems, and site and environmental conditions. The relative importance of the various items will vary from site to site.

1.2 STANDARDS AND CODES

Apparatus used, methods and procedures followed, forms and calculations performed, etc., shall conform to the latest revision of relevant ASTM standards, codes and specifications. The number specifications, codes, and standard to used in soil investigation is too much to be mentioned one by one in this standard.

2 INVESTIGATION REQUIREMENTS

2.1 GENERAL

The foundation conditions for structures, even modest ones, should be investigated before the design is undertaken. The purposes of such investigations are to provide:

- a) The owner with knowledge of the subsurface conditions of his property adequate to establish feasibility and economics of a project as affected by subsurface conditions.
- b) The designer with information for foundation design.

2.2 OBJECTIVES

Following check list shall be used as guidelines for performing required investigations.

- 2.2.1 Legal and code requirements or as defined by regulatory bodies or agencies.

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- Protection of existing structures.
- Location or spacing of borings, etc.
- Supervision of work.
- Seismic considerations.
- Data to be obtained and format of presentation.
- Safety of the public.
- Existing underground concealed facilities such as canals, wells, etc.

2.2.2

Requirements of structure and contents.

- Size, arrangement, and loading.
- Elevation of lowest floor and highest possible foundation grade.
- Tolerance of structure and contents to settlement.
- Vibration.
 - a) Generated by equipment in structure?
 - b) Equipment or contents sensitive to vibration from external sources?
- Special problems.
 - a) Dynamic analysis.
 - b) Unusual or demanding requirements of structures or contents.
 - c) Unusual temperature ranges, as for furnaces or cold storage plants.

2.2.3

Construction procedures and problems.

- Requirements for protection of existing structures and facilities, including buildings, roads, waterways, underground piping, and the public.
 - a) Deformation disturbance of loss of stability attendant to deep excavations.
 - b) Effects of pile driving such as heave or vibration.
 - c) Effects of dewatering.



- d) Effects of fills or stock piles on adjoining structures either from settlement or lateral distortion.
- e) Deformation resulting from squeeze into holes prebored for piles in soft clay.
- Extent, depth, and arrangement of deep excavations.
 - a) Effects on adjoining areas or structures.
 - b) Heave of bottom.
- Extent, depth, and duration of dewatering.
 - a) Possible effects in nearby areas.
 - b) Requirements if any for maintaining ground-water levels under adjoining structures or areas.

2.2.4 Site Conditions.

- Grading, either excavation or filling.
- Drainage, both temporary and permanent.
- Access, temporary and permanent.
- Annual rainfall and distribution in time.
- Range of tides, if applicable.

2.3 DATA TO BE OBTAINED OR DEVELOPED

2.3.1 Location of proposed structure or facility relative to existing structures or facilities by plan and elevation, existing physical condition of each, and effects of proposed structure on its facilities, especially:

- Existing buildings including their foundations.
- Existing roads, walks, waterways, etc.
- Underground piping, gas, water, sewerage, drainage.
- Easements or legal restrictions on site development.
- Existing drainage.