

CIRCULAR

**GUIDING GEO-TECHNICAL SURVEYS IN SERVICE OF SELECTION OF
CONSTRUCTION LOCATIONS AND DESIGNING OF WORKS**

Pursuant to the Government's Decree No. 36/2003/ND-CP of April 4, 2003, defining the functions, tasks, powers and organizational structure of the Ministry of Construction;
Pursuant to the Government's Decree No. 16/2005/ND-CP of February 7, 2005, on management of investment projects on construction of works;
Pursuant to the Government's Decree No. 112/2006/ND-CP of September 29, 2006, amending and supplementing a number of articles of Decree No. 16/2005/ND-CP of February 7, 2005, on management of investment projects on construction of works;
Pursuant to the Government's Decree No. 209/2004/ND-CP of December 16, 2004, on quality management of construction works;
The Ministry of Construction guides geo-technical surveys in service of selection of construction locations and designing of works as follows:

I. GENERAL PROVISIONS

1. Scope of regulation.

This Circular provides guidance on geo-technical surveys in service of selection of construction locations and designing of works irrespective of their investment capital sources, and defines responsibilities of organizations and individuals involved in those surveys.

2. Interpretation of terms.

In this Circular, the terms below are construed as follows:

a/ Geo-technical survey (hereinafter referred to as survey) means part of construction survey conducted to assess the geo-technical conditions, anticipate their changes and impacts on construction works in the process of their construction and use.

Geo-technical survey includes geo-technical survey and geo-technical observation.

b/ Geo-technical conditions include topographical and geo-morphological characteristics; geological structure; tectonic characteristics; hydro-geological characteristics; hydro-meteorological characteristics; petrological composition; physical-mechanical features of soil and rock; and unfavorable natural and geo-technical processes.

c/ Survey site means the place where, during a survey, drilling, excavation and field test (penetration, cut, static compression, transversal compression, permeation experiment, etc.), geo-physical measurement' are carried out.

3. Survey tasks shall be drawn up by design contractors or construction survey contractors at the request of investors. Separate survey tasks shall be drawn up for the selection of construction locations or the designing of works.

Investors who fully meet relevant capability conditions under regulations on construction survey or construction designing of works may themselves draw up survey tasks.

4. Contents of survey tasks shall comply with Article 6 of the Government's Decree No. 209/2004/ND-CP of December 16, 2004, and Points 2.2.1 and 2.3.1., Section 2, Part II of this Circular. Survey tasks are subject to approval by investors and serve as a basis for making plans on survey techniques.

5. Investors shall organize the selection of qualified survey contractors according to regulations to conduct surveys.

6. Plans on survey techniques shall be made by survey contractors and used as a basis for selection of survey contractors. Selected survey contractors shall finalize their plans on survey techniques and submit them to investors for approval before implementing them.

Plans on survey techniques must be compatible with the approved survey tasks and conformable with applied standards and must take into account the volume and nature of survey jobs, the extent of research and complexity of the natural conditions of the survey area or site.

7. Major contents of a plan on survey techniques:

- Grounds on which the plan is made, such as characteristics of the to be-constructed work, survey tasks, geo-technical characteristics, and the extent of existing research on the geo-technical conditions of the construction site;
- Composition and volume of survey work;
- Methods and equipment to be used;
- Applied standards;
- Organization of implementation;
- Implementation schedule;
- Methods of protecting technical infrastructure facilities and related construction works;
- Measures of protecting the environment: water sources, noise, exhaust gas, etc.;
- Cost estimate of survey work.

The contents of the approved plan on survey techniques must be reflected in the survey contract.

During the survey process, if detecting abnormal factors, the survey contractor may propose adjustments or supplements to the contents of the plan on survey techniques without changing the approved survey tasks. Proposals of the survey contractor are subject to approval by the investor.

8. When performing the survey tasks, the survey contractor shall appoint a survey manager who fully meets the capability conditions specified in Article 57 of the Government's Decree No. 16/2005/ND-CP of February 7, 2005, and shall notify the investor of the standard conformity laboratory where experiments will be conducted under the latter's supervision.

9. Survey work must be regularly and systematically supervised from commencement to completion by persons with relevant expertise.

10. Survey results must be expressed in a report, which covers an explanation part and annexes. The format and details of such a report shall comply with applied standards.

The contents of the explanation part of a report are stipulated in Clause 1, Article 8 of the Government's Decree No. 209/2004/ND-CP of December 16, 2004.

A report's annexes may include: a general geological map; a field map on geo-technical and hydro-geological measurements; a map on the topography and location of the survey site; a plan on exploration sites; drill masts; geo-technical cross-sections; charts and results of field experiments such as permeation, penetration, cutting, transversal compression and static load compression experiments, etc.; charts and general tables of the results of mechanical, physical and chemical experiments of soil, rock and water samples in laboratories; documents on hydro-geological and hydro-meteorological explorations; geo-physical charts and cross-sections; a general table of altitudes and coordinates of exploration sites; photo albums and other related materials (if any).

The quantity and contents of documents in the annexes to a report must be compatible with the contents of the conducted survey.

11. The report on survey results must be checked before its take-over by the investor, which is recorded in writing as stipulated in Article 12 of and Appendix 2 to the Government's Decree No. 209/2004/ND-CP of December 16, 2004. In case of necessity, the investor may hire another construction designing or survey contractor to comment and evaluate the survey results before accepting the report.

The dossier of take-over of survey results indicated in Appendix 2 to the Government's Decree No. 209/2004/ND-CP of December 16, 2004, must include a written record on take-over of field survey jobs and a written record on take-over of completed field survey jobs as guided in Appendices 1 and 2 to this Circular (not printed herein).

12. Additional survey work may be conducted only in the cases specified in Article 9 of the Government's Decree No. 209/2004/ND-CP of December 16, 2004. The investor shall approve additional survey tasks and an additional plan on survey techniques and shall sign an additional survey contract with the survey contractor for performance.

13. Survey work must have contents relevant to the designing steps stated in Section 2, Part II of this Circular. When the geo-technical conditions of the survey site and the technical requirements of the work are not complicated, survey work may be carried out once to serve many designing steps but the survey contents must be reflected in the plan on survey techniques which is subject to approval by the investor.

14. All acts of deception and connivance to distort survey results are forbidden. Investors, survey contractors, design contractors, supervision contractors or individual supervisors shall take responsibility or joint responsibility before law for their performance results; if causing damage, they shall pay compensation for damage caused due to their fault.

II. SURVEYS IN SERVICE OF SELECTION OF CONSTRUCTION LOCATIONS AND DESIGNING OF WORKS

1. Survey for selection of construction locations.

1.1. Survey for selection of a construction location shall be conducted when the geo-technical conditions constitute a major factor decisive to the selection of the construction location of a

work. Depending on the complexity of geo-technical conditions and the characteristics of the work to be constructed, part or the whole of survey work stated at Point 1.3, Section 1, Part II of this Circular may be conducted.

1.2. Survey in service of selection of a construction location shall be conducted for all plans under consideration in the area or line where a work is expected to be constructed on the basis of a topographical map of 1:2000, 1:5000, 1:10000 or 1:25000 or smaller scale, depending on the area of the survey site.

1.3. Composition of survey work for selection of location:

a/ Collecting, analyzing and systemizing existing survey documents of the construction area or site;

b/ Inspecting the geo-technical conditions (general survey);

c/ Making geo-technical measurements and drawings;

d/ Conducting geo-technical and hydro-geological explorations;

e/ Conducting geo-physical explorations (when necessary).

1.4. Geo-technical measurement and drawing work in service of selection of a construction location shall be conducted only when necessary, depending on the area and geo-technical conditions of the survey site and the characteristics of the to be-constructed work. The volume and contents of measurement and drawing work must be selected according to the scale of the map to be drawn.

1.5. Geo-technical and hydro-geological exploration work in service of selection of a construction location shall be conducted only with a restricted volume when there are no or insufficient exploration documents or in areas with unfavorable geo-technical conditions.

1.6. The report on survey results should contain an analysis and evaluation of data in all plans under consideration so as to ensure an appropriate location for the construction of the work, a reasonable identification of the positions of key works along the construction line, and proposals on survey jobs and methods for the subsequent designing step.

2. Survey in service of construction designing steps

2.1. General requirements:

2.1.1. The composition and volume of survey work shall be determined based on the designing steps, characteristics of the to be-constructed work, natural conditions of the survey area, the complexity of geo-technical conditions, existing survey documents, etc., while ensuring that all soil and rock layers within the scope of influence of the work's loading capacity will be surveyed. Coordinates and altitudes of survey sites may be assumed but must be measured and linked with the system of coordinates and altitudes of the work or of the national system when necessary.

2.1.2. Composition of survey work in service of designing steps:

a/ Collecting, analyzing and assessing existing survey documents of the construction area; assessing the actual conditions of adjacent construction works which affect the project's works;

b/ Conducting geo-technical measurement and drawing;

- c/ Conducting geo-technical and hydro-geological explorations;
- d/ Conducting geo-physical explorations (when necessary);
- e/ Conducting hydro-geological survey (when necessary);
- f/ Studying tectonic characteristics (when necessary);
- g/ Testing soil, rock and water samples at laboratory;
- h/ Conducting geo-technical observation;
- i/ Adjusting and making a report on survey results.

In case of necessity, separate plans on survey techniques may be made for each individual survey job.

2.2. Survey in service of the basic designing step.

2.2.1. The survey tasks must clearly state the characteristics and size of the to be-constructed work, the site and scope of the survey; applied standards and survey timing.

2.2.2. Requirements on survey work in the basic designing step:

- a/ Generalization of the geo-technical conditions of the construction area, with special attention paid to discovering the law of distribution in width and depth of weak stratigraphic units, the law of operation of unfavorable natural geological processes such as karst, depression, sliding, upraising, erosion, groundwater, etc.
- b/ Assessment of geo-technical conditions of the area where major and heavy works are located.

2.2.3. Positions of survey sites shall be arranged on the following principles:

a/ For concentrated construction works:

- The positions of survey sites shall be arranged in lines or grids perpendicular to and parallel with the directions of the geological structure or axial lines of works. A topographic map normally has a scale of 1:2000, 1:1000 or 1:500 or larger, depending on the area of the land plot on which the work is to be constructed.
- For major works and works with a big loading capacity, the positions of survey sites shall be rationally arranged within the limits of the grounds on which works are to be constructed.

b/ For works constructed in lines:

Survey sites shall be arranged along the center of the line and the typical cross-section in terms of topographic and geo-technical conditions. A topographic map normally has a scale of 1:10000, 1:5000 or 1:2000 or larger, depending on the scope of lines. Additional survey sites should be arranged in the places where the stability of a work is at risk such as weak land, high mountainous or steep places, on a topographic map of 1:2000 or 1:1000 or larger scale.

2.2.4. The number and depths of and distances between survey sites shall be determined according to applied standards and depending on the size of works and the complexity of geo-technical conditions of the area to be surveyed.

2.2.5. In the basic designing step, all survey jobs may be performed to meet the requirements specified at Point 2.2.2, Section 2, Part II of this Circular.

2.2.6. The survey results obtained in the basic designing step must supply all necessary data for determining a plan on: total ground area, ground fill-up, major technical infrastructure facilities, treatment of the base and foundation, major bearing structures of the work; proposed survey methods and areas with unfavorable geological conditions which need to be surveyed in the subsequent designing step.

For works to be constructed in lines, the survey results obtained in the basic designing step must also supply all necessary data for proposing major works along the lines and on typical horizontal and vertical sections along the lines; and must propose a plan for removing major obstacles along the lines and the corridors to ensure the stability of the works.

2.3. Survey in service of the technical designing step (in case of three-step designing) or the designing of the construction drawing (in case of two-step or one-step designing).

2.3.1. Contents of survey tasks: Apart from the contents specified at Point 2.2.1, Section 2, Part II of this Circular, the survey tasks must also include proposing a foundation design plan and anticipating the loading capacity and dimensions of work items.

2.3.2. Survey work in the technical designing step must provide accurate data on the geo-technical conditions of the construction area and work items and identify survey jobs in service of subsequent designing steps.

2.3.3. Principles on the arrangement of exploration sites:

a/ For concentrated construction works:

- Exploration sites shall be arranged within the limits of the construction ground of each work. A topographic map normally has a scale of from 1:1000 to 1:100, depending on the size of works.

b/ For works to be constructed in lines: Exploration sites shall be arranged along the center of the line and the typical cross-section with a higher density than in the preceding designing step in order to obtain more accurate data on the geo-technical conditions of the entire line. A topographic map normally has a scale of from 1:2000 to 1:500 or bigger, depending on the length of the line and the geological complexity of the area to be surveyed. Additional exploration sites should be arranged in the places where the stability of a work is at risk such as weak land, high mountainous or steep places, on a topographic map of 1:1000 or 1:500 or bigger scale.

2.3.4. The number and depths of and distances between exploration sites shall be determined according to applied standards, the technical designing step and the type of works.

2.3.5. Survey work in service of the technical designing step includes drilling, field experiments and laboratory experiments, which are selected to meet the requirements on the treatment of the base, foundation and bearing structures of works.

2.3.6. The survey results obtained in the basic designing step must supply all necessary data for making calculations regarding the treatment of the base, foundation and bearing structures of works with all necessary dimensions; propose construction rational solutions to treating the base, foundation and bearing structures of works, ensuring safety for works and adjacent works.

For works to be constructed in lines, the survey results obtained in the technical designing step must also supply all necessary data for determining works to be constructed along the lines, typical horizontal and vertical cross-sections of all ground layers along the lines, and must decide

on a plan for handling major obstacles along the lines and precisely locate the corridors to ensure the stability of works.

2.4. Survey in service of the construction drawing designing step (in case of three-step designing):

2.4.1. Survey in service of the construction drawing designing step (in case of three-step designing) may only be conducted in the following cases:

- The geo-technical conditions are complex or there are abnormal changes which need to be determined precisely in specifically designing the treatment of the base, foundation and bearing structure of the work.
- The position and size of a work are changed; the measures of designing the treatment of the base, foundation and bearing structure of a work are changed.
- The line of works is adjusted or moved.

2.4.2. Survey work in service of the construction drawing designing step includes survey jobs like those required in the technical designing step but gives priority to field experiments and geo-technical observations to meet treatment requirements. When necessary, additional experiments on mechanical and physical indicators of soil and rock and chemical indicators of water may be proposed so as to determine the volume, depth and composition of survey jobs.

2.4.3. Exploration sites shall be arranged on the principles stated at Point 2.3.3, Section 2, Part II of this Circular and in places where additional survey is required. The number and depths of and distances between exploration sites shall be proposed by the designing or construction contractor and are subject to approval by the investor.

2.4.4. The survey results must help identify precisely locations with complex geo-technical conditions or experiencing abnormal geological changes and supply all necessary data for the detailed designing of the treatment of the base, foundation and bearing structures of works and for making decision on rational construction solutions to ensure safety for works and their adjacent works.

III. RESPONSIBILITIES OF ENTITIES IN SURVEY WORKS

1. Responsibilities of investors:

1.1. To manage the quality of survey work through approving survey tasks, plans on survey techniques, organizing survey supervision and taking over reports on survey results according to the provisions in Chapter III of the Government's Decree No. 209/2004/ND-CP of December 16, 2004. An investor who has no expertise for performing those tasks may hire organizations or individuals with relevant expertise to perform them.

1.2. To select survey contractors that meet all capability conditions specified in Article 58 of the Government's Decree No. 16/2005/ND-CP of February 7, 2005, to conduct survey; to arrange and appoint staffs with relevant expertise to check the capabilities of contractors and survey managers.

1.3. To sign contracts with survey contractors; to assign survey tasks to survey contractors, hand over ground areas to survey contractors and create conditions for them to conduct survey; to make full payments to survey contractors on the basis of the survey volume already performed and checked before take-over.

1.4. To take responsibility for the quality of information and documents relevant to survey work supplied to survey contractors and designing contractors.

1.5. To organize the preservation of survey dossiers.

1.6. When receiving additional survey proposals, if accepting them, to add survey tasks and sign additional survey contracts with survey contractors. When finding it necessary, to consult designing contractors or other survey contractors before accepting those proposals.

2. Responsibilities of survey contractors:

2.1. To draw up survey tasks as requested by investors; to make plans on survey techniques, and make reports on survey results according to the requirements of the designing steps.

2.2. To conduct survey only within their registered business registration scope and when meeting the capability conditions specified in Article 58 of the Government's Decree No. 16/2005/ND-CP of February 7, 2005, on the basis of the plans on survey techniques already approved by investors and the signed contracts.

2.3. To appoint staffs who meet all relevant capability conditions as survey managers according to Article 57 of the Government's Decree No. 16/2005/ND-CP of February 7, 2005. To arrange sufficient staffs who have relevant professional experience and capability to conduct survey.

2.4. To internally monitor and check plans on survey techniques and reports on survey results before submitting them to investors; to take responsibility to investors and before law for the results of surveys they have conducted.

2.5. To organize internal supervision of the implementation of survey processes according to the approved plans on survey techniques; to fully record the supervision results in the survey diaries.

2.6. When conducting survey, if arises additional survey volume as compared with the approved technical plan, to propose additional survey tasks to investors and to proceed with the survey only after obtaining the approval thereof from investors.

2.7. To ensure safety for people, equipment, technical infrastructure facilities and other construction works in the survey area and site; to protect the environment and preserve the landscape in the survey area; to restore the sites after completion of survey.

2.8. To ensure that machinery and equipment used in survey work conform with standards and be safe when in use according to their designed functions. Not to use gauging equipment and tools which are not yet tested, with improper uses or not to use them in excess of their designed capacity or not to use those with an expired useful life.

2.9. To organize the preservation of survey dossiers.

2.10. To keep confidential according to regulations documents relevant to survey work which need to be kept confidential.

2.11. To pay compensation for damage caused by their improper performance of approved survey tasks and plans on survey techniques or their improper use of information and documents or improper application of regulations and standards, resulting in wrong survey results and unnecessary survey volume, and for other damage caused due to their faults.

3. Responsibilities of designing contractors:

3.1. To draw up survey tasks in service of designing work to meet the requirements of designing steps.

3.2. To propose additional survey and draw up additional survey tasks when finding that survey data are insufficient for designing work.

3.3. To perform construction designing only on the basis of the reports on survey results already checked and taken over by investors according to regulations.

3.4. To pay compensation for damage caused by their wrong determination of survey tasks, resulting in the need to conduct a new or an additional survey because the results of the conducted survey fail to meet designing requirements or for other damage caused due to their faults.

4. Responsibilities of survey-supervising organizations and individuals:

4.1. To supervise survey work in accordance with investors' requirements expressed in economic contracts.

4.2. To appoint persons with relevant expertise to supervise survey work.

4.3. To check the capability conditions of survey contractors and survey managers and the appropriateness of survey equipment as committed by survey contractors with investors in the bid dossiers or the signed contracts.

4.4. To supervise the survey processes implemented on the field and in laboratories against the approved technical plans.

4.5. To check and take over the completed survey volume as a basis for investors to finalize all payments for survey work.

4.6. To take responsibility to investors and before law for the taken-over survey volume. To pay compensation for damage if failing to find out that survey contractors have improperly carried out the approved plans on survey techniques, resulting in the need to conduct a new or an additional survey because the results of the conducted survey fail to meet designing requirements or for other damage caused due to their faults.

IV. ORGANIZATION OF IMPLEMENTATION

1. Ministries, ministerial-level agencies, government-attached agencies and People's Committees at all levels shall, within the scope of their responsibilities and powers, direct investors, designing contractors, construction survey contractors, construction survey supervision contractors and related organizations and individuals to perform survey work under the guidance of this Circular.

2. Ministries that manage specialized construction works shall organize the review, revision and promulgation of survey standards suitable to the nature and characteristics of specialized construction works.

3. The Construction Services of provinces and centrally run cities shall act as key bodies assisting provincial-level People's Committee presidents in guiding, overseeing and inspecting investors, designing contractors, construction survey contractors, construction survey supervision contractors and related organizations and individuals in their localities to perform survey work under the guidance in this Circular; and report on a biannual and annual basis report to their

provincial-level People's Committees and the Ministry of Construction on the implementation in their localities.

4. Organizations and individuals that commit violations in survey work guided in this Circular shall, depending on the nature and severity of their violations, be handled in accordance with law; if causing damage, they shall pay compensation for damage caused due to their faults.

5. This Circular takes effect 15 days after its publication in "CONG BAO".

In the course of implementation, any arising problems should be reported by ministries, branches, localities and related organizations and individuals to the Ministry of Construction for study and settlement