No. S 7 [No. JKM.PHB. 100-1/2/Jld. 5/(128)

SURVEYOR ORDINANCE 1960

SURVEYORS (CONDUCT OF UNDERGROUND UTILITIES SURVEYS) REGULATIONS 2017

ARRANGEMENT OF REGULATIONS

Regulation

[No. JKM.PHB. 100-1/2 Jld. 5/(128)

SURVEYORS ORDINANCE 1960

(No. 22 of 1960)

SURVEYORS (CONDUCT OF UNDERGROUND UTILITIES SURVEYS) REGULATIONS 2017

In exercise of the powers conferred by section 19 of the Surveyors Ordinance 1960 [*No. 22 of 1960*], the Surveyors Board, with the approval of the State Secretary, makes the following regulations:

Citation and commencement

1. (1) These regulations may be cited as the Surveyors (Conduct of Underground Utilities Surveys) Regulations 2017.

(2) These Regulations come into operation on the date of its publication in the *Gazette.*

Interpretation

2. In these Regulations unless the context otherwise requires:-

"Board" means the Surveyors Board establish under section 3 of the Ordinance;

"bench mark" means a height control monument established by JUPEM;

"Confidence Level" means the achievable accuracy of the survey results;

"Director" means the Director of Lands and Surveys Department in the State and includes any officer duly authorised to act on that behalf;

"District Surveyor" means the District Surveyor of the Lands and Surveys Department in the district and any officers duly authorised to act on that behalf;

"E.D.M." means electronic distance measuring equipment;

"E.S.P." means Engineering Survey Paper containing instruction by the Director to carry out the underground utilities survey by Licensed Surveyor;

"Global Navigational Satellites Systems (GNSS) Surveying Equipment" means an equipment for ascertaining the position on the ground by receiving signals from Satellites Systems;

"GPR" means Ground Penetrating Radar equipment which detects and records positioning and depth of underground utility based on image interpretations using radar method;

"Index Map" means a map of smaller scale on which are depicted the locations (with accompanying designations) of other specific data, such as larger-scale topographical quadrangles;

"JUPEM" means Jabatan Ukur dan Pemetaan Malaysia;

"Licensed Surveyor" means a registered surveyor licensed in accordance with section 10 of the Ordinance and shall possess the minimum qualification in underground utilities survey as prescribed by the Board;

"Ordinance" means the Surveyors Ordinance 1960;

"PCL" means Pipe and Cable Locator equipment which detects and records positioning and depth of underground utility;

"R.S.O." means Borneo Rectified Skew Orthomorphic projection;

"Survey Corridor" means corridor to be scanned;

"Survey Plan" means survey plans prepared in an approved format with title blocks approved by the Director. All legends and symbols used in the plans shall be those currently used by the profession. The plans shall where necessary, have an overlap of not less than 50 mm with match lines shown;

"Survey Technician" means a survey technician registered in accordance with subregulation 4(3) of the Surveyors (Conduct of Title Surveys) Regulations 1962.

"Total Station" means an electronic theodolite (transit) integrated with an electronic distance meter;

"Trial Pit" means the excavation made to determine, measure and record the presence of a utility structure;

"Underground Utilities Survey" means surveys for underground utilities which require the correct interrelation of boundaries or of boundary marks and the making and recording of all measurements and calculations relevant thereto and the drawing and reproduction of plans therefrom;

"utility" means a privately or publicly owned line, facility, or system for producing, transmitting, or distributing communications, cable television, power, electricity, light, gas, oil, crude products, water, waste, or other similar commodity, including any fire or police signal system or street light system.

E.S.P.

3. (1) A Licensed Surveyor shall apply for E.S.P. to commence a survey to the Director and such application shall set out the purpose and extent of the proposed survey route.

(2) The Licensed Surveyor shall also be responsible in obtaining all clearances and site permissions from the relevant authorities before commencing work; or occupying any premise.

Personal direction and supervision

4. Every underground utility surveying work shall be made under the immediate personal direction and supervision of a licensed surveyor and in strict accordance with these Regulations.

Equipment calibration

5. All equipment utilised for underground utility survey such as PCL or GPR must be calibrated at an approved base, or by any other method which meets the Director's approval.

Projection and coordinates system

6. (1) All underground utility survey works should be based on the R.S.O. co-ordinates.

(2) All heights shall be based on the National Geodetic Vertical Datum.

Datum and closing of traverses

7. (1) Every licensed surveyor making an underground utility survey shall take all responsible care to verify the datum adopted and shall furnish full details thereof in his field notes. Such datum shall be two marks of a former title survey of adequate technical value proved by measurement (or by traverse and calculation) and by astronomical observation for azimuth, or by angular and linear measurement to a third such mark, to be in their original position.

(2) All bearings shall be closed at intervals of not more than twenty-five stations, either on proved marks as for datum above or on a line whose bearing has been determined by astronomical observations.

Linear measurement

8. In making linear measurements using total station, E.D.M or steel tape, distances shall be read to the nearest three decimals of a metre.

Location and extent of area to be surveyed

9. (1) The licensed surveyor shall obtain from the client, the relevant maps and/or plans showing the location of the proposed site and the extent of the area to be surveyed. The exact location of the site shall be agreed to by the client before the surveyor proceeds with the survey works.

(2) Notwithstanding the above, the surveyor shall obtain and study all relevant information and maps/plans necessary for the proper execution of the survey works.

Classification of surveys

10. The classification of surveys under these Regulations is based on the degree of Confidence Level on the locatable services and is as follows:

Level 0 - Compilation Report based on visual investigation and map compilation;

Level 1 - Depth accuracy +/- 300mm up to 80% of representative samples of points on locatable services;

Level 2 - Depth accuracy +/- 250mm up to 85% of representative samples of points on locatable services;

Level 3 - Depth accuracy +/- 200mm up to 90% of representative samples of points on locatable services.

Programme of survey work

11. (1) The Licensed Surveyor shall prepare a programme chart for work both in the field and drawing office.

(2) The work programme must take into consideration the required Confidence Level, density of the traffic flow and underground utilities within the specified time without sacrificing accuracy. Although it is uncommon to work in security areas where working hours are limited, such circumstance must be considered when stipulating the time allocated. The work schedule shall contain the following:

(a) sequence of survey activities, the time required for each activity and the total time required to complete the entire survey; and

(b) date of submission of survey reports and final drawings.

Survey staff, *etc*.

12. The surveyor shall provide such staff, instruments and equipment, tools, materials, tent, transport, *etc*., as to ensure the completion of the work to the standards and within the time schedules specified. Survey Technicians shall possess the minimum qualification or competence in underground utility survey as prescribed by the Board.

Planimetric control

13. (1) Planimetric control shall be provided and determined by theodolite or Total Station traversing. The co-ordinates of planimetric control points shall be calculated and finalised in terms of R.S.O.

(2) The permissible traverse linear closing error shall be 1:4000 or better.

(3) All planimetric control points shall be marked using permanent ground makers and shall be clearly and legibly inscribed.

(4) Notwithstanding subregulation (1), in the event of non-availability of Government control points within a reasonable distance from the proposed site, and with the consent from the department, planimetric control points can be established using Global Navigational Satellites Systems (GNSS) Surveying Equipment.

Height control

14. (1) The height controls shall be established by levelling operations from existing bench marks established by JUPEM. The major levelling network shall start form a minimum of two bench marks or at least one standard bench marks. All TBM shall be established within the major levelling network or connected to it by closed levelling circuit(s).

(2) Vertical misclosures within the leveling network and between bench marks shall not exceed the lesser of the following:

(a) ± 16mm;

(b) ± (20vK)mm where K is sum of the distances levelled in Kilometres.

(3) Notwithstanding subregulation (1), in the event of non-availability of bench mark within a reasonable distance from the proposed site, and with the consent from the client, height control points can be established by using Global Navigational Satellites Systems (GNSS) Surveying Equipment.

Features to capture

15. The surveyor shall survey the locations and dimensions of the following existing features within the survey corridor:

(a) horizontal and vertical location of the top and/or bottom of the utility referenced to approved survey datum;

(b) elevation of the existing underground utility at a trial pit, whenever necessary, to be referenced to the project datum;

(c) outside diameter of the utility and configuration of non-encased, multi conduit systems;

(d) utility structure material composition, when reasonably ascertainable;

(e) bench marks and/or project survey data are to be used to determine elevation;

(f) paving thickness and type, where applicable; and

(g) other relevant information.

Detection interval

16. Every underground utility detection needs to be done in continuous intervals of 20m along the route and with additional detection (less than 20m) for the following conditions:

(a) when the underground utility connects with another part of utility on the ground. In this condition the position of that part needs to be detected;

(b) at the location where there is a change of underground utility directions;

(c) in certain condition which we needs dense intervals because of various utilities; and

(d) the position of utility at/on the surface of the ground need to be survey.

Field records

17. (1) The field records must be properly kept in accordance with good practices and shall record truthfully all the survey work carried out.

(2) On completion, all field records and computer data, drawings, calculations and work sheets shall be properly labelled. All records, calculations, drawings, etc. shall be in metric units.

Location plan

18. (1) The location plan of the survey area shall be drawn at a suitable scale such that the area being surveyed can be accommodated into a single standard sheet of A1 size. Where applicable, the chainage of the center-line shall be indicated to facilitate cross-reference to detail plans.

(2) Notwithstanding the above, where the surveyed area is relatively small, the location plan can be incorporated in the detail plan.

Deliverables formatting

19. (1) The final report and plan deliverables to show and depict the various utility types, quality and/or ownership by the use of labels, symbols, colours, line weight, layer and annotations may be based on formats as approved by the Director.

(2) Cadastral boundaries and lot numbers shown shall be from records of the Lands and Surveys Department.

(3) Names of buildings, streets, roads, rivers and other marginal information such as district, town, city, north arrow, legend, date and map index shall be shown.

(4) Paper Size Plans must be plotted at suitable scales on A1 paper size or smaller.

Reports, survey plans and records

20. Upon the completion of the survey work, the surveyor shall submit to the client –

(a) two sets of hard and soft copy of the report;

(b) two sets of hard and soft copy of the survey plans; and

(c) all relevant data, field books, drawings, calculation sheets, *etc.* including schedules of all permanent ground markers with reference numbers and coordinates.

Submission of survey plans and records

21. A copy of the final report and utility survey plans and in digital form must be extended to the Director.

Certification

22. Every survey plan shall bear a certification by the Licensed Surveyor in the following form:

> "I, ... a surveyor licensed under the Surveyors Ordinance 1960, certify that the survey from which this plan has been prepared was carried out in the field in strict accordance with the Surveyors (Conduct of Underground Utilities Surveys) Regulations 2017, and that this plan correctly represents the survey completed on the ..... day of ....., 20 .....

Dated this day of , 2017.

.....
Licensed Surveyor".

Made 14 June 2017

HAJI SAFAR BIN UNTONG,
Chairman,
Surveyors Board, Sabah.

I approved the foregoing Regulations.

Dated 28 June 2017

TAN SRI DATUK SERI PANGLIMA HAJI SUKARTI BIN HAJI WAKIMAN,
State Secretary.