Guidelines For Engineering Drawing Submission And Engineering Works For Commercial, Industrial and Residential Development

General

1. The document consists of guidelines for project development in soft ground conditions. It covers the obligations of the developer and design consultant in implementation of the project.
2. The objective of these guidelines is to standardize and streamline practice of construction in soft ground conditions in Sibu, with the goal of minimizing maintenance by establishing performance criteria. These criteria would be the basis for authorities to accept the handing over of completed projects.
3. Technical reports throughout the project implementation would include detail soil investigation or geotechnical report, design reports, and ground settlement analysis. They shall be submitted by qualified registered professionals on behalf of the developer.
4. Any special ground treatment required to achieve the performance criteria, must be clearly stated and construction specifications and methods to be clearly spelt out.

Obligations Of Developer Or Project Owner

1. Primary responsibility to ensure projects meeting the set performance criteria belongs to the developers or owners of project. They shall engage only registered professionals and qualified contractors to execute the design and construction work respectively.
2. Developers shall be primarily responsible for the quality of construction work. They are to ensure compliance to the design intent as expressed in the project drawings and specifications.
3. Developers shall provide the method statement for construction that can ensure compliance to performance criteria, particularly those relating ground subsidence to surrounding area and changes in water table.
4. Pre-construction conditions of existing structures surrounding the project site, shall be precisely recorded in a manner that is indisputable. Where possible, photographic evidence shall accompany all written record, and these shall be verified by the design professionals and agreed by the owner of the properties.
5. Developers shall record pre-construction ground condition such as, existing ground and water table levels. These levels shall be verified by licensed land surveyor before submission to the authorities.
6. Developers shall be responsible for the accurate recording of all the required ground behavior during construction and shall make provisions for independent verification by design professional or authorities at any time.

Obligations Of Design Professionals

1. Design professionals include the architects, engineers, quantity surveyors and land surveyors. They shall be registered with their respectively professional bodies and shall be engaged by the developer to provide technical advice and recommendations pertaining to the design and construction of projects in soft ground conditions.
2. They shall be primarily responsible for all the design works that provide assurance to the authorities that the required performance criteria can be met.
3. Soil investigations shall be carried out only by companies registered with The Malaysian Site Investigators Association. General format and guideline for the geotechnical report are as in the Appendix. All soil data shall be verified by the design engineer engaged for the project.
4. The design engineer shall be required to produce and submit all the technical engineering reports, that includes the geotechnical reports and design reports. Reporting may be in stages, starting with preliminary reports and if necessary, detail reports.
5. Technical reports shall contain engineer's advice and recommendations on how the performance criteria can be achieved for the proposed project. It is required to detail out the most appropriate type of design, any special ground treatment required, and material and construction specifications.
6. Design calculations predicting behavior of the soft ground during and after construction of the project, shall be submitted to the authorities, so that the relevant data such as ground settlement and ground water level can be precisely monitored and recorded. These data shall then be used to validate the design calculations and prediction of post-construction behavior of the ground.
7. Design professional shall decide on the type and extent of data to be taken during constructions. They shall be responsible to verify all the data recorded by the developer.

Document Submission

The following shall be submitted through Land & Survey Department:

1. Engineering Drawings for Road and Drain and Details.
2. Engineering Treatment Method Deployed, if any.
3. Soil Investigation / Geotechnical Report
4. Engineering Calculation including ground settlement analysis.
5. Relevant Forms

Performance Criteria

1. All works and treatment employed for the infrastructure works for any components of any development that is having a commercial, **industrial and/or residential** development must be designed based on the Soil

Investigation and shall be able to sustain maximum settlement of 200mm for a period of two years from the date of handing over.

2. Ground subsidence in the surrounding area, that is due to construction activities, must be kept to a minimum so as not to cause any damage to the existing properties.
3. Water table in the surrounding area shall be maintained, unless it can be proven that any change in water table will not have any detrimental effects to the existing properties.
4. Post-construction settlement shall be determined by observation methods. During construction, ground settlement shall be monitored and recorded, and these data would be used to predict the post-construction settlement using established methods. All construction activities affecting settlement shall be precisely recorded.

Deposit

1. Deposit shall be made payable to Sibu Municipal Council in cash or unconditional bank guarantee upon Completion and before the road certificate is issued. The deposit shall be based on the assumption that the infrastructure works as designed based on the accepted Soil Investigation and approved Engineering Drawings subside by 300mm over a period of two years.

2. If settlement of any portion of the engineering works exceed 200mm after 2 years from the date of acceptance of the completed engineering works, the developer shall raise up the engineering works to design level. If the developer fails to do so within two months after being notified in writing by the Council, the Council shall make use of the security deposit to raise up the engineering works to design level.

Engineering Works Totally On Pile Foundation And/Or Suspended Slab

1. In case the whole engineering works is designed with pile foundation and /or suspended slab, no deposit will be payable. The consultant may decide the scope of soil investigation that he deems sufficient.

2. **The soil treatment methods must not allow inaccessible void to be created underneath suspended structures and shall be determined at the conceptual design stage, and evaluated by the authority at the submission on the first geotechnical report.**

3. **The voids underneath any suspended slab are permitted only when they can be accessed for inspection and maintenance. The headroom for such space shall be not less than 2.2m and shall be provided with adequate drainage and ventilation. Long-term settlement limit of the base of the void shall comply with what is earlier specified.**

4. **The space created underneath suspended structures on hill slope will only be permitted when it can be shown that it will not hinder inspection and maintenance works.**

5. **Design live load for suspended carriageway shall not less than 16 KN/m^2.**

Appendix

Soil Investigation or Geotechical Report shall consist but not limited to the following items:

Cover Letter and Title Page

Table of Contents

Executive Summary

Sections of Report:

Section **1**: Introduction and Background

- 1.1 Responsible Party Information
- 1.2 Consultant Information
- 1.3 Site Location
- 1.4 Site History

Section **2**: Scope of Work

Section **3**: Site Investigation Results, Risk Criteria

- 3.1 Methods of Investigation
  - (a) Field Test
    - i. Standard Penetration Test at every 1.5m or change in soil strata layer.
    - ii. Vane Shear Test for undisturbed and remoulded condition of soft soil layer at every 2m for SPT less than 5 (or terminated at 14m depth).
    - iii. Coring stop at SPT ► 50 or deeper as required by The Engineer.
    - iv. Permeability of all clay below the ground for SPT ◄ 5
  - (b) Chemical Test (Test for soil and water samples)
    - i. Organic Matter Content
    - ii. Total Sulphate Content
    - iii. PH Value
  - (c) Classification Tests
    - i. Moisture Content
    - ii. Trial Axial Test
    - iii. Consolidation test of various layer (for soil where STP is less than 5)
    - iv. Density of the soil of various layers
    - v. Atterberg limits

Section **4**: Conclusion

4.1 Summary of Results

4.2 Engineering Consideration and Recommendations

Section **5**: References

Section **6**: Figures

• Regional Location Map

• Site and Property Maps

• Soil Sample Results Summary Maps

• Geologic Cross Sections

• Hydrogeologic Maps

Section **7**: Data Tables, Graphs and Statistical Analyses

• Soil Analytical Results Summary

• Groundwater Elevation and Free Product Interim Action Results

• Groundwater Analytical Results Summary

• Graphs and Statistical Analyses

Report Appendices:

A Methods of Investigation

B Analytical Methods and Laboratory Data Reports

C Borehole Documentation

D SPT Documentation

E Other Documentation

Note:

All tests as specified in BS 1377:1975 / BS 1377:1990 / BS 5930:1981 or latest BS standard or unless otherwise stated.