

# TECHNIQUE OF CONTROL SUBSIDENCE IN THE PORT OF DJEN DJEN TO JIJEL IN ALGERIA

Hamadache Miloud <sup>1</sup>, Mouli Mohamed<sup>1</sup> and Berrabah Hamza Madjid<sup>\*:2</sup>

<sup>1</sup>Materials Laboratory, Department of Civil Engineering, National Polytechnic School Oran Algeria,

<sup>2</sup>Laboratoire des Matériaux et Hydrologie, Sidi Bel Abbes, Algérie

\*Corresponding author e-mail: *\*b\_hamza\_2005@yahoo.fr*,

**Abstract-***objective of this work is to control soil subsidence and the measuring location of the quay wall and container terminal port of djen-djen.the measurement period manufacture coffered end of the work (until completion).this is necessary to measure:*

- *When designing, due to lack of data of the geotechnical conditions, it is to cope with defects are found during the implementation.*
- *Ensuring that quality of construction through the measurement control and ensure the performance of geotechnical and structural design.*
- *Grace to the management and analysis of data measurements and enriched database, you may also make savings and earning reliability by applying them to the design and realization, data reliability in the future.*

*Measuring instruments installation objects if the gauge of subsidence according to the measurement objects in measuring the eventual subsidence after the implementation of the structure and comparing the actual measurement / theoretical subsidence.*

**Keywords:** control soil subsidence, Theoretical subsidence, Data reliability, Performance of geotechnical

## I.0 INTRODUCTION

That study is to measure location: quay wall and Container Terminal of the Port of DjenDjen-  
Measuring period: Manufacture of boxes ~ End of work (until completion) measurement  
Zone: Port of DjenDjen, located about 10 km east of Jijel.



**Figure 1:** Port Location Djendjen to Algeria

## II.1 NECESSITY AND OBJECT CONTROL MEASURE

### II.2 NECESSITY CONTROL MEASURE

During the design, due to lack of data geotechnical conditions, it is to deal with defects found during the implementation.

- Ensure the quality of construction through the control measure and ensure the performance of geotechnical and structural design.
- Thanks to the management and analysis of measurement data and enriched database, you can also make savings and gain reliability by applying them to the design and implementation, data reliability in the future [3].

### II.2 OBJECT CONTROL MEASURE

Objective of this measure is to condoler during the design, because of lack of data geotechnical conditions, it is to find the cause of an unexpected possible displacement and propose measures.

When making should be installed / bury measuring instruments to measure the variation of stress and displacement and collect data for soil stability.

## III.3 INSTALLATION OF MEASURING INSTRUMENTS

### 3.1 INSTALLATION OBJECT OF MEASURING INSTRUMENTS ACCORDING TO THE MEASUREMENT OBJECT

Subjects measurement	Measuring instrument	Installation object and its use
subsidence	Gauge subsidence	Measure the possible sag after the implementation of the structure - Compare the actual measurement / theoretical subsidence - For the measures for the care and maintenance after completion

horizontal displacement	underground inclinometer	Measure the horizontal displacement using established depths of buried quay wall for safety. Assess the movement of the soil and the level of stability due á the horizontal load.
	inclinometer	Measuring the horizontal displacement of the structure after the fill. Assess the movement of the soil and the level of stability due á the horizontal load.

**Table 1:** This is the example for table formatting [1]

### III.2 PLAN VIEW AND VIEW OF MEASURING INSTRUMENTS INSTALLATION CUT

The measurement location is selected based on geotechnical and construction conditions of the site, to better ensure the functions and purpose of measurement and, taking into account the synthetic test results of changing conditions building in order to prevent progression.

### III.3 POINTS TO CONSIDER WHEN CHOOSING THE INSTALLATION

Analysis of the effectiveness of soil improvement and stability control to sensitive areas and sectors representative of the entire site.

- protected area of the ship and heavy machinery.
- Special sectors as main structures and joining part
- suitable location to connect measurements with geotechnical studies
- A suitable location to facilitate comparison of measures given the closest facility between instruments.

### III.4 MEASURES TO BE APPLIED

representative areas, sensitive areas identified during the design and major structures.

- Ensure the safety of the quay wall and the basin and provide detailed joint portions studies.
- Meanwhile geotechnical investigations, enforce terms of a return [2]
- measuring instruments will be installed in order to effectively assess the safety of structures.

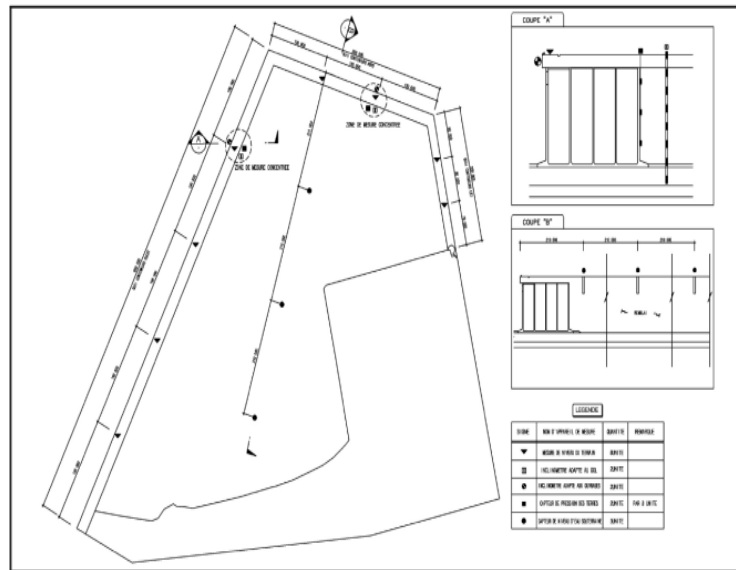


Figure 2: Plan view and section view [1]

#### IV.1 MEASURING INSTRUMENTS FOR INSTALLATION PLAN AND CONSIDERATIONS

#### IV.2 INSTALLATION PLAN AND POINTS TO CONSIDER

In principle, the level must be measured by systematically comparing it with the level of topographic reference.

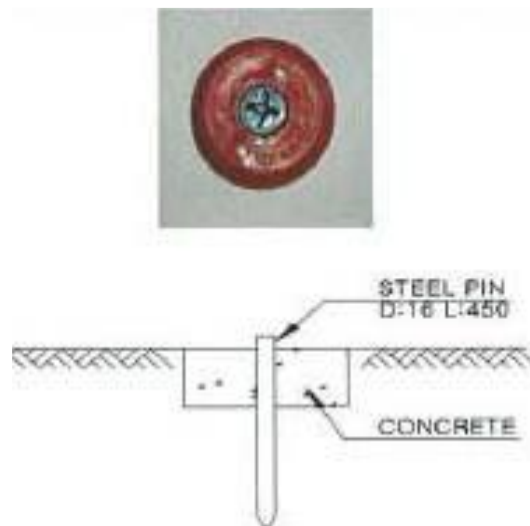
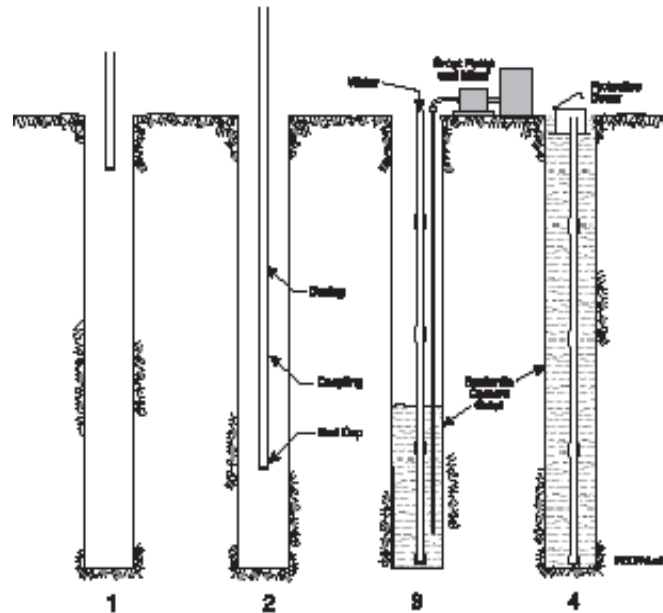


Figure 3: Surface settlement pin type Manual

#### IV.3 SUBTERRANEAN INCLINOMETER

underground inclinometer guide lines should be equipped with two guide holes in having flexibility and sufficient strength to facing the displacement variation. Predictable[4].

- Les guide pipes are attached to the solid support and, after installation, alignment should be checked according to their depth.
- The pipes must be protected during installation and use [5].
- Inclination is measured at 50 cm from the bottom.



**Figure 4:** Installation of groundwater inclinometer Plan

## V.1 CONCLUSIONS

In conclusion, the time of clearing of land is decided taking into account the current slump, residual subsidence and soil density as to control filling, or the slope at Marly, but when it comes to work chambers on the sandy soil, the management of sag is not necessary because the slump is considered finished during construction.

Because of this, just check the travel trend (differential or uniform subsidence) provide a comparison of results of displacement after the measures to ensure the subsidence control and security after the backfill behind the box.

## REFERENCES

- [1] Container Terminal in the port of Djendjen 08- 2015
- [2] Geotechnical 1 - J. Lérau INSA 2006.
- [3] Annnn B, "Unpublished work but accepted", accepted, Year.
- [4] laboratory testing and introduction of soil mechanics June 1973 p20-22.
- [5] NBN EN ISO 3696: 1995 - Water for analytical laboratory use - Specification and test methods