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Evaluation the Geotechnical properties of fine grain sources of Sarney dam (South of Iran)

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ABSTRACT: Sarney dam is located in the Hormozgan province southeast of the Minab city. Perpous of study is divergence of soil with used physical and chemical test. Then study and used gradation, chemical, pinhole and atterbery limits test. In this study show that the ingredient is more CL, CL-ML and SC in engineering classification, the percent of damp soil is between 3.61- 13.23, sodium suction ratio between 37.5- 48.03 and sequence L.L and P.I limits is 7- 16 and 21- 30.

***Keywords*:** Sarney dam, soil divergence, Atterberg limits, engineering geology, geotechnics.

INTRODUCTION

Divergence soils in geotechnical engineering are among the most problematic soils and monuments as one of the causes of soil degradation are the hydraulic structures - dirt and water channels have been the source of many injuries (Das, 1997). Divergence is a phenomenon in which soil that come in contact with water float on water environment The woman is out of power (Oladejo, 2014; Askari and Fakher, 1993).

The mechanical properties of most soils saturated with moisture and can change and this phenomenon has been known for geotechnical engineers. Some of the increase in soil moisture, special phenomenon occurs, sometimes leading to major losses in construction projects would be. These soils can be called susceptible soils against water (Ansariar, 2014).

Sarney Dam on the river of the same name, with the aim of providing needed water areas plain Karyan - Raveng, the region is expected to provide part of the required drinking (Hormozgan Regional Water Company, 2006). Sarney dam in the province, 34 kilometers southeast of the Minab city at position 26 ˚ 97' North latitude and 57 ˚ 28 ' East longitude is located (Figure 1). Access road to the dam road to the indenture MINAB then sidetrack the length of the dam is 19 km.

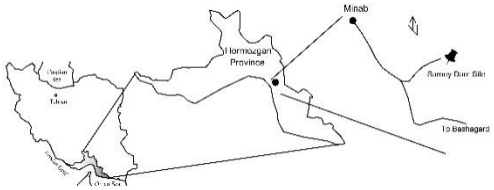

Figure 1. Geographical location and access road to the dam site

Basic geological regions:

Point of view geology of the study area located on the western margin of the Makran and southeast adjacent the Zagros structural zone. The dominant lithology in the area of Makran units, including units middle Miocene Gooshi Marl, middle - upper Miocen Kheku sandston, upper Miocene Tiyab sandstone unit, Pliocene Minab conglomerate and Quaternary deposits (Aghanabati, 2004).

Zendan fault is the main fault near the site, its going with the order of about N160 and the steep gradient towards the North East and nearly vertical, western margin of the Makran zone is formed. Many faults, almost parallel to the

zendan fault, all of which have been split custody of their physical mechanisms (possibly reverse dextral component), such as Palamy, Minab, Deraz, Sham and Sagar faults.

Field studies and laboratory experiments:

Grading:

The results of seed samples from boreholes at a depth of 4 m in Table 1.

Table 1. Grading Borrow fine

TPFN-26	TPFN-25	TPFN-24	TPFN-23	FN-7	FN-6	FN-5	FN-4	FN-3	FN-2	FN-1	Sample No.
CL	CL	SC	CL-ML	CL	CL	CL	CL	CL	CL	CL	Soil classification

moisture

The results of these tests are presented in Table 2.

Table 2. Results of moisture

TPFN-10	TPFN-10	TPFN-10	TPFN-8	TPFN-8	TPFN-8	TPFN-6	TPFN-6	TPFN-6	TPFN-3	TPFN-3	TPFN-3	Sample No.
11.31	13	7.29	5.4	3.61	4.45	13.23	9.03	5.36	5.2	8.52	5.12	moisture

Atterberg Limits

Atterberg way to describe hypersensitivity associated with percent change in moisture content of fine-grained soils developed under a contract, depending on the moisture content, the nature and behavior of soil can be divided into state of four-Solid and Pastiness semi-solid and (plastic) and liquid (lubricant).

The Psychic (Liquid Limit):

Between pulp and liquid water content, the soil shear strength is low, this parameter Kasagrandeh methods, is measured according to ASTM-D 4318 standard (Das, 1997).

Plastic Limit

Where moisture is moisture, typical pasty or plasticity threshold, the method has been tested in accordance with ASTM-D 4318 standard.

PI = LL – PL

Table 7. Results of tests Atterberg Limits

TPFN-26	TPFN-25	TPFN-24	TPFN-23	FN-7	FN-6	FN-5	FN-4	FN-3	FN-2	FN-1	Sample No.
10	10	11	7	9	11	16	9	9	10	8	P.I.%
26	26	27	21	25	27	30	27	25	26	24	L.L.%
16	16	16	14	16	16	14	18	16	16	16	P.L%

Laboratory tests

Chemical test

The results of chemical tests conducted on the samples is described in Table 5.

Table 5. Results of chemical tests

K^+ m.eq/lit	Na^+ m.eq/lit	Mg^{2+} m.eq/lit	Ca^{2+} m.eq/lit	T.D.S WT%	OM WT%	SO_4^{2-} WT%	PH In 25 C°	depth cm	Sample No.
0/59	339.48	9.33	11.15	1.38	0.25	0.67	8.9	600	Fn-13
0.7	378.43	8.45	9.89	1.49	0.44	0.8	8.8	600	Fn-14
0.64	350.61	11.07	7.99	1.31	0.31	0.73	9.1	600	Fn-15
0.7	361.74	6.51	8.93	1.59	0.5	0.86	9	600	Fn-16

Pin hole test

Pinhole test, the horizontal flow of water under hydraulic height of 50 mm diameter hole in the soil caused by a millimeter, starts (Das, 1997). The results are given in Table 6.

Table 6. Results Pinhole

Divergence classification	Pin hole size (cm)	Depth (cm)	Sample No.
Dark	2	600	TPFN-13
Dark	2	600	TPFN-14
Dark	1.5-2	600	TPFN-15
Dark	2	600	TPFN-16

sodium adsorption ratio and electrical conductivity values:

The parameters in the following table.

Table 7. Results of experiments sodium adsorption ratio and electrical conductivity

Sample No	FN-16	FN-15	FN-14	FN-13
SAR	46/03	40/15	44/18	37/5
EC	0/159	0/131	0/149	0/138

Cramp Test:

Cramp test results on samples studied are given in Table 8.

Table 8. Results cramp

Sample No.	Result test*
TPFN-26	Light response
TPFN-25	Light response
TPFN-24	Light response
TPFN-23	Non response
FN-7	Light response
FN-6	Non response
FN-5	Non response
FN-4	Light response
FN-3	Non response
FN-2	Light response
FN-1	Light response

* with response (very divergence), Light response (divergence) and Non response (Non divergence)

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CONCLUSION

According to the results of laboratory tests carried out, the moisture the samples between 61/3 to 23/13 varies according to size, most of the type property are plastic with low latency (CL).

Pinhole test results, all samples are in dark type are classified divergence. Liquid and plastic limit samples was between 7 to 16 and 21 to 30, sodium absorption ratio, minimum and maximum of 37.5 and 48.03, the PH samples 8.8 to 9.1 variable. Based on the test results cramps, most cases are mild reactive.

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