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Evaluation the Geotechnical Properties of Coarse Grain Sources of Ladiz Dam (East of Iran)

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ABSTRACT: Ladiz dam located distance of 18 km from the Mirjaveh city. The study area located in Iran East flysch zone. The aim of this study is evaluation the geotechnical of coarse Source in the site. This research based on survey data which collected by the library, field and laboratory studies. In this study, we tested the samples, such as gradation, situ density, Specific gravity determination, straight shear, Modified compaction and Los Angeles. The results of test show that the most soils sit in gradation SP, specific gravity between 2.6 to 2.7, situ density test between 1.48 to 2.17, los angles test between 19.40 to 21 and optimum water content present between 5.4 to 9.

***Keywords*:** Coarse Source, Engineering Geology, Geotechnical Engineering, Iran, Ladiz Dam.

INTRODUCTION

One of the important sources of financing in development projects and construction sources which constructed construction. Sources with geological, lithology and stratigraphy properties are closely related to each area, so based on the identification of appropriate quality and quantity of resources lending takes place.

The study area in the East of Iran, Sistan and Baluchistan Province, geographical coordinate's 28˚ 52' 33" north latitude and is located 61˚ 14' 9" east longitude. Road access to the are a by road Zahedan-Mirjavehand thensidetrackis18kilometers (Figure 1).

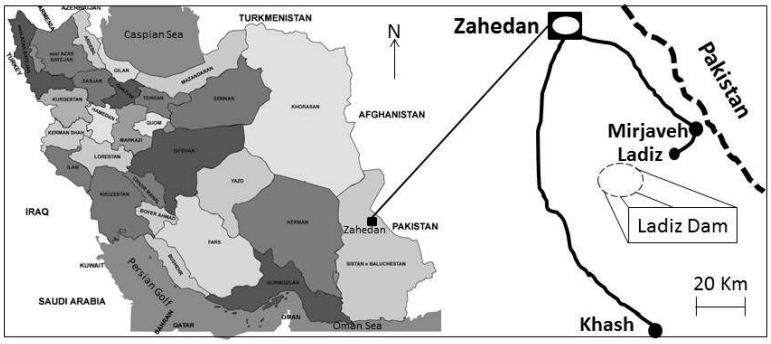

Figure 1. Geographical location and access to the area

Geology and Geomorphology of area

Eocene flysch facies in the study area, set in the South East of Iran, the zone name Zabul - Baluch (Berberian and King, 1981), Sistan Suture zone (Samani and Ashtari , 1992; Tyrol, 1983; Camp and Griffis, 1982) and or zone Nehbandan - Kash is (Stocklin, 1973; Eftekharnejad, 1977). Rock units in the study area includes a colorful mélange , flysch of Cretaceous , Paleocene and Eocene flysch of the ultrabasic parts, materials, volcanic and clastic rocks are Neogene (Aghanabati, 2004). The oldest exposed rocks in the area of the colored compounds in the western areas close to the fault Nehbandan spreading. Mountains are relatively long, parallel to the general direction

northwest - southeast direction in this area exists in the north basin further north - south and south - east - western (Pourkermani and Zomorodian, 1992). Taftan Mountain is located with an altitude of 4061 meters north of the basin (AlaeiTaleghani, 2002).

RESULTS AND DISCUSSION

Discussion and Conclusion

The initial stages of this research, based on library research, field and laboratory studies that are based on maps, reports and scientific papers presented in this issue have been conducted. The field visits took place in the desired position. Based on the information collected, the sampling was carried out from debt. Field tests, including density and moisture content at the site, as well as laboratory tests, gradation, density, direct shear, density modification, and Los Angeles carried permeability. The results of these experiments are as follows.

Situ density test

Foundations for measuring density, Borrow and Place the method used (Das, 2006; Das, 2007). The results in Table 1 are presented. Soil moisture levels were very low, and the maximum is 6%. It samples were taken from a depth of 2.5 meters.

Table 1. Results Insitu Density

	TP1	TP2	TP3	TP4	TP5	TP6	TP7	TP8	TP9	TP10	TP11
Wet Density (gr/cm^3)	2.03	1.64	2.31	2.06	2.24	2.05	1.97	1.48	2.18	2.08	2.02
W%	3	6	1.5	2	2.3	1	2	3	1.5	1.5	1
	TP12	TP13	TP14	TP15	TP16	TP17	TP18	TP19	TP20	TP21	TP22
Wet Density (gr/cm^3)	1.94	1.93	1.99	2.11	1.96	1.97	1.69	1.92	2.17	1.94	2.11
W%	1.35	4	2	2	3.5	1.5	0.7	1.5	4	2	3

Gradation

Physical examination was performed first to identify and evaluate properties that have been conducted in accordance with ASTM-D 2487 standard (Pamela, 2007). The results are given in Table 2 According to this classification, soil samples are mostly sand and gravel. In some places, gravel more than the sand, but in general, the type of soil, sand is gritty. Grading quality, because the CC is close to 1, so the soil is placed exactly in-between state cannot be a distinct ion between good and bad aggregation.

Table 2. results of seed samples

Sample No	1	2	3	4	5	6	7	8	9	10
Soil classification	SP	GW	GW	SP	SW	SP	SP	SP	GP	SP
Sample No	11	12	13	14	15	16	17	18	19	20
Soil classification	SW	SP	SP	SP	SW	SW	GW	GW	SW	GP

Specific gravity

In performing various calculations in soil mechanics, soil seed density of ten is required. Grain density range usually between 2.6 to 2.9, the density of quartz sand grains which are mostly made of light about 2.65andthe density of silty and clayey soils around 2.6 to 2.9 (Das, 2006; Das, 2007).Changes in soil density of approximately 2.6 to 2.68were calculated and are given in Table 3.

Table 3. results of the specific gravity of grains

Sample No	1	2	3	4	5	6	7	8	9
Gs	2.68	2.7	2.67	2.60	2.65	2.60	2.62	2.60	2.65
Sample No	10	11	12	13	14	15	16	17	18
Gs	2.62	2.67	2.65	2.65	2.63	2.62	2.67	2.68	2.62

Straight shear test

The purpose of this test is typically measured strength parameters of the soil is drained. The test specimens with dimensions of 30 × 30 cm with three different verticals tresses and performed according to standard ASTM-D3080 and the results are presented in Table 4.

Table 4. Direct shear test results

Sample No	1	2	3	4	5	6	11	12
Friction angle deg.	42.9425	43.0161	39.356	44.640	43.850	44.710	42.184	45.945
Cohesion (kg/cm^2)	0.06	0.12	0.04	0.1	0	0.1	0	0.07
G (kg/cm^2)	202.3	154.13	170	203.61	177.37	198.33	199.47	185.87
Sample No	13	14	15	16	17	18	19	20
Friction angle deg.	42.528	42.381	42.985	45.172	41.348	41.870	42.930	42.954
Cohesion (kg/cm^2)	0	0.05	0	0	0	0.02	0	0.12
G (kg/cm^2)	170	200.6	209.1	154.42	162.07	200	197.77	185.87

Modified compaction test

In this test, the soil was mixed with a certain percentage of water in a special form at with a hammer density is beaten. SamplestestedunderASTM-D1557standardandthe test results are given in Table 5.

Table 5. Modified compression test results

Sample No	1	2	5	6	11	12	14	15	16	17	19	20
Optimum Water Content (%)	7.60	5.40	6.90	8.10	7.00	7.40	7.80	7.70	6.75	7.00	9.00	7.80
Max Density (gr/cm^3)	2.18	2.26	2.25	2.18	2.21	2.25	2.18	2.20	2.22	2.18	2.16	2.17

Los Angles test

In this test, the particle sizes of the stones marked with a number of standard steel balls (usually 12) inside a steel drum dumped after a certain number of rotating cylinders (500 to 2,000 rpm), the mass loss is calculated as the percentage of particles be. Samples taken from a depth of 3 meters and the Iranian concrete code (215) tested the samples in the range of 19.40 to 21 who fall into the category of fragile and stone. The results of these tests are given in Table 6.

Table 6. Resultsin Los Angeles

Sample No	1	2	3	4	5	6	11	12
LS (%)	20.30	19.40	19.51	20.10	20.00	20.50	19.60	19.40
Sample No	13	14	15	16	17	18	19	20
LS (%)	21.00	20.90	21.00	19.60	20.00	20.20	19.80	19.60

Constant head test

The test for coarse soil swith high perme ability and is done according to standard ASTM-D2434. The results of these tests are listed in Table 7.

Table 7. Results Constant head test

Sample No	1	2	3	4	6	9
Permeability Coefficient (cm/s)	2.6E-04	1.5E-03	4.5E-05	2.2E-04	1.7E-03	1.1E-03
Sample No	10	11	13	14	16	19
Permeability Coefficient (cm/s)	4.5E-04	6.3E-04	1.8E-05	3.5E-03	5.5E-05	7.0E-02

REFERENCES

Aghanabati A. 2004. Geology of Iran, Geological Survey and Mineral Exploration of Iran.pages 586.

AlaeiTaleghani M. 2002. Geomorphology of Iran. Published Ghomes, first edition, page 123.

Braja M Das. 2006. Principles of Geotechnical Engineering, Sixth editions, Chris Carson Publisher. 589p.

Braja M Das. 2007. Principles of Foundation Engineering, Seven editions, Global Engineering Publisher. 795p.

Berbrian M and King GCP. 1981. Towardsa paleogeography and tectonoic evolution of Iran,Conadian Journal of Earth Sciences 18, pages 210-265.

Camp WE and Griffis RJ. 1982. Character, genesis and tectonic stting of igneous rocks in the Sistan suture zone, eastern Iran, Lithos, ISSN 0024-4937, NOR, pp. 45-47.

Eftekhar Nejad J. 1977. East Iranian plate tectonics, geological seminar on the province, the mines in Sistan and Baluchestan , Zahedan.

Pamela JW and Gore. 2007. Sedimentary Rock Classification Table, Department of Geology, Georgia Perimeter Collage.

Pourkermani M and Zomorodian MC. 1992. About the geomorphology of Sistan and Baluchestan, Journal of Geographical Research, Publications Razavi , Mashhad , third year , pages 172-159.

Rahnamarad J, Bazvnd AK, Ansarifar M and Hosseini Sh. 2013. The use of sources for construction Eyvashan Dam (East Khorram Abad), 17th Symposium of Geological Society of Iran, ShahidBaheshti University, Tehran, Iran.

Samani B and Ashtari Sh, 1992. The geological formation of the region of Sistan and Baluchestan , Journal of Earth Sciences , Volume 1 , Number 4 : 25-14 .

Stocklin J, Eftekhar Nejad J and Houshmandzadeh A. 1973. A preliminary study of geology in Central Lut, Eastern Iran, translation regulation and J. EftekharNejad, 1977, Report No. 22 , Geological Survey and Mineral Exploration of Iran.

Tirrul R, Bell IR, Griffis RJ and Camp VE. 1983. The Sistan suture zone in eastern Iran, Geol. Am. Bull. 94: 134-150.