



The Quality Development of the By-product from the Construction Sand Production Process for Substituting Raw Material in the Glass Industry, Case Study: Ban Lad Construction Sand Plant, Ayuthaya Province

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Background

Problem 1: The huge amount of the tailing from sand Construction Sand Production Process

- low cost
- hi contaminant (low %Si, hi %Fe, hi%Al₂O₃)
- burden to management

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Background

Problem 2 : The reducing of silica sand reserve

- high trend of conservation of natural resources and environment
- the potential silica sand area is developing to serve the tourist industry (hi investment cost to mining)

Background

**Hi amount of the tailing
from construction sand industry**



Upgrade by the mineral processing



The difficulty of the silica sand supply



Objective

to find the process in laboratory scale to development quality of by-product from construction sand process for substitution silica sand in glass industries



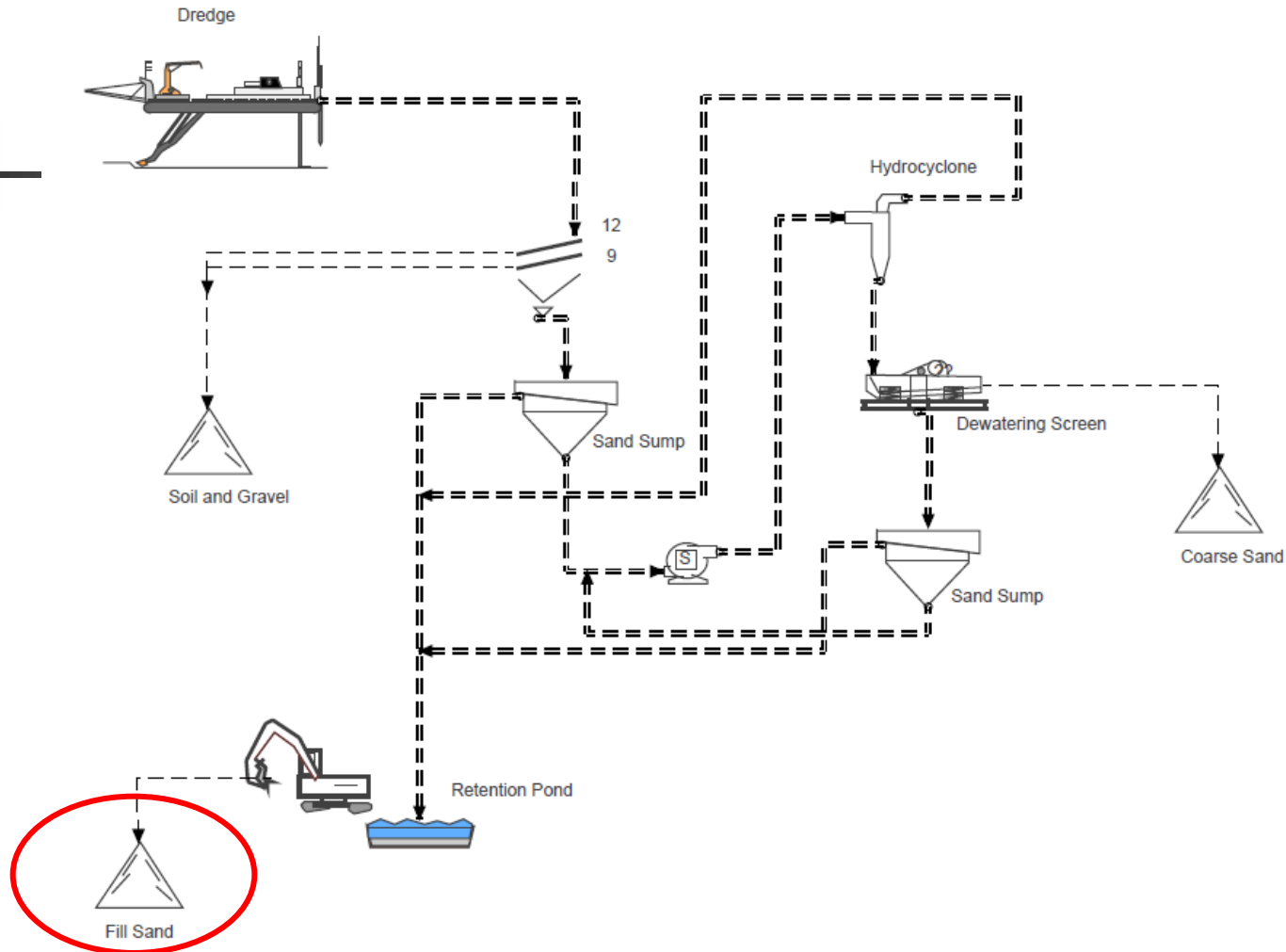
DPIIM cooperates with SCCO have initiated idea for development fill sand to silica sand.

Ban Lad construction sand plant

- located in Ayuthaya province
- 80 Kms, ahead north from Bangkok.
- Sand reserve more than 20 Million ton



Ban Lad Sand Plant



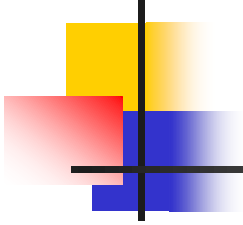
**fully controlled by Siam City Concrete Company
(SCCO)**

Fill Sand



Sieve no	upper Layer Percent passing	Lower Layer percent passing	ASTM C-33 percent passing
3/8 inch (9.50 mm.)	98.88	94.40	100
No.4 (4.75 mm.)	96.03	94.31	95 -100
No.8 (2.36 mm.)	91.30	86.36	80 -100
No.16 (1.18 mm.)	81.63	72.01	50 - 85
No.30 (0.60 mm.)	65.16	54.81	25 - 60
No.50 (0.30 mm.)	34.81	29.62	10 - 30
No.100 (0.15 mm.)	12.69	14.18	2 - 10
FINESS MODULUS	2.19	2.50	2.15 – 3.38

The by-products sand (Fill Sand) ~15,000 tpm





Ban Lad Sand Plant

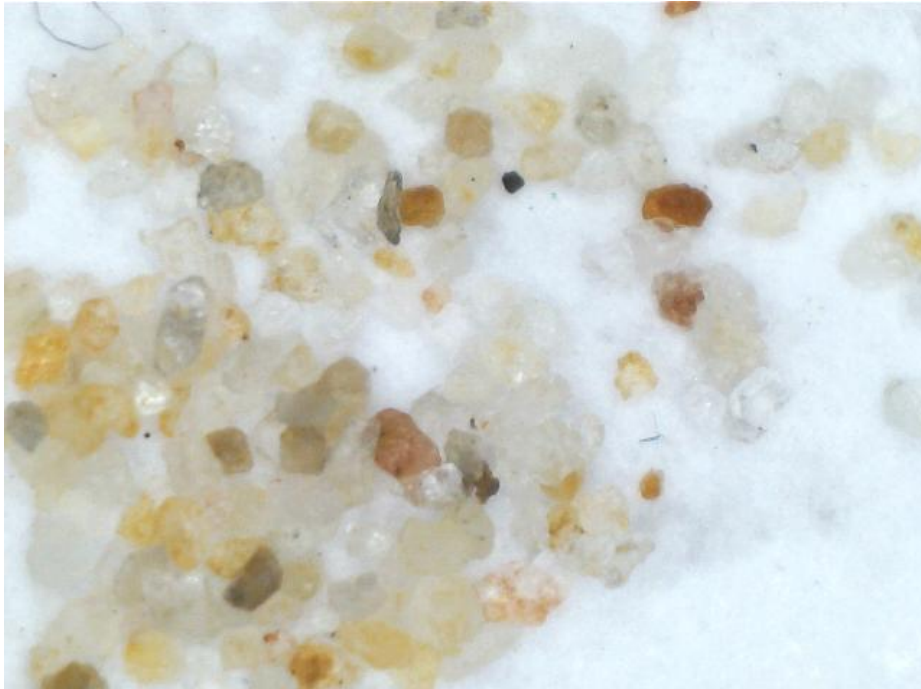
Sample	Chemical Composition (% weight)		
	Fe_2O_3	Al_2O_3	SiO_2
Ban Lad Fill Sand	1.67	5.71	90.51
Standard Sand in Glass Industry	0.03	0.1-0.5	98.5



By product from
construction sand plant



Silica Sand

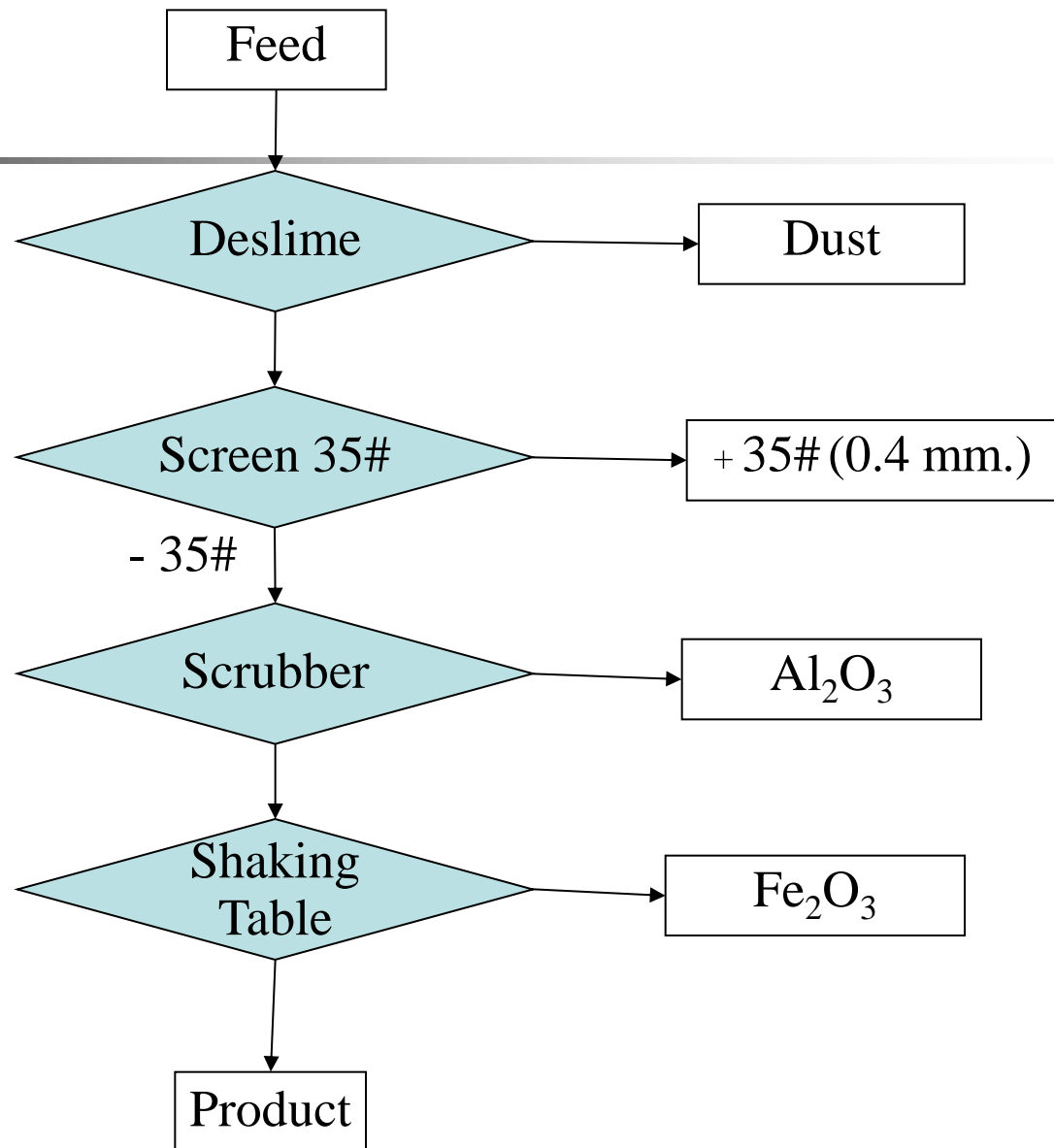


By product from
construction sand plant



Silica Sand

Experiment flow chart





Scrubber
to reduce Al_2O_3



Shaking table
to reduce %Fe

Result



Sand from
Construction
sand plant



After the scrubber



Heading from
shaking table



Result

Sample	Chemical Composition (% weight)		
	Fe ₂ O ₃	Al ₂ O ₃	SiO ₂
Ban Lad Fill Sand	1.670	5.710	90.510
Product	0.019	0.099	99.033
Standard Sand in Glass Industry	0.03	0.1-0.5	98.5



Discussion & Conclusion

1. By-product from construction sand process mainly used as land filled or waste sand can be upgraded to the quality by mineral processing technology for substitution natural silica sand in glass industries



Discussion & Conclusion

2. It should expand the experiment to the pilot scale and promote the glass producer to use the upgrades by product sand instead of the silica sand.
3. It should have experimental study of the upgrading quality of the by-product sand from construction sand process at the other potential deposits because each deposit may have different physical and chemical compositions.



Discussion & Conclusion

4. It should have the experimental study of taking the upgraded quality by-product for substitution silica sand in the other industries using silica sand as raw material such as chemical industry and ceramic industry. This is to support the usage of the upgraded quality by-product for substitution silica sand in industries using silica sand as raw material



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