

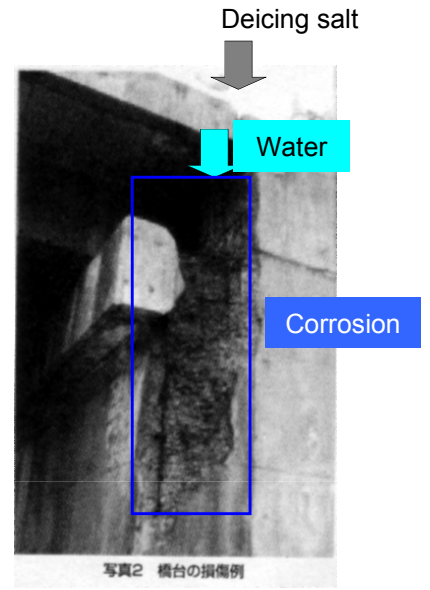
Stagnation Of Liquid Water/ Chloride Ion Penetration and Application of The Knowledge To Concrete Classification

Kishi Lab.

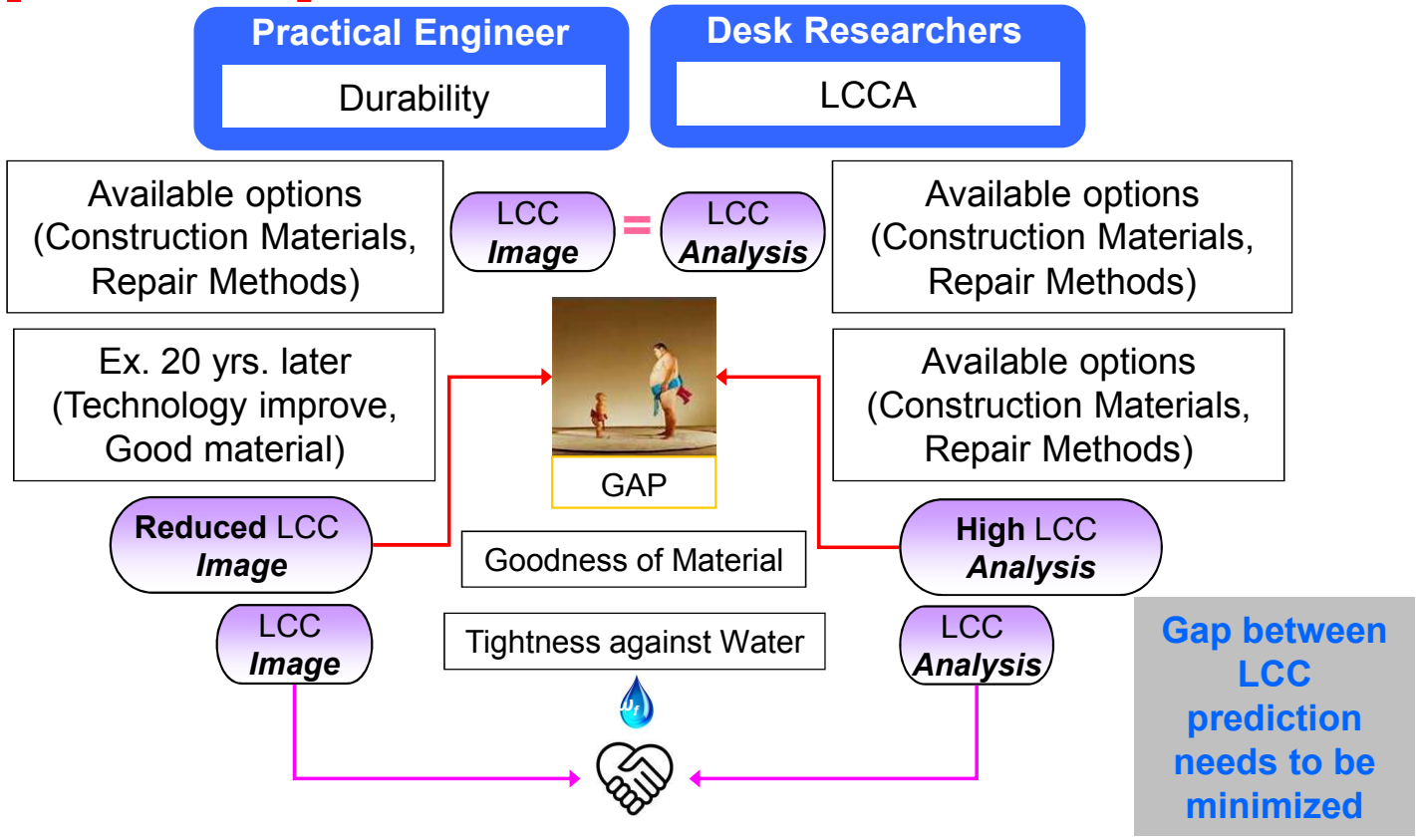
[PROBLEM]

Water is threat for infrastructure that helps foreign deleterious materials to penetrate inside concrete to initiate corrosion of reinforcement

But in conventional Fick law, there is no place to account liquid water front as a parameter that may decrease *service life* and increase *LCC* for infrastructure as well



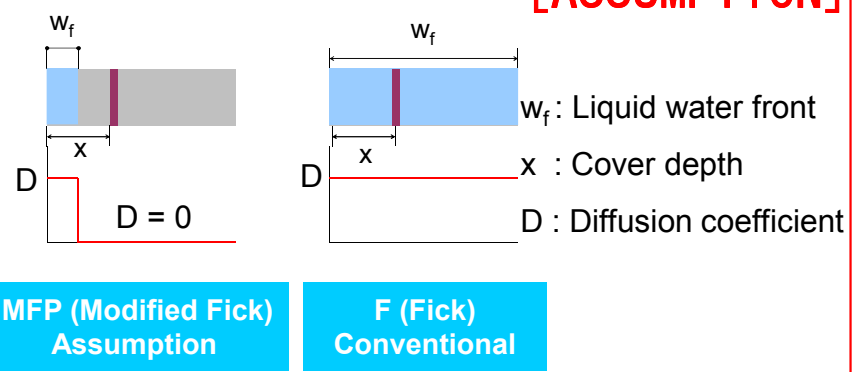
[BACKGROUND]



[OBJECTIVE]

Bridge up the Gaps between professionals regarding LCCA by incorporating Liquid water front as a parameter

[ASSUMPTION]



MFP (Modified Fick) Assumption

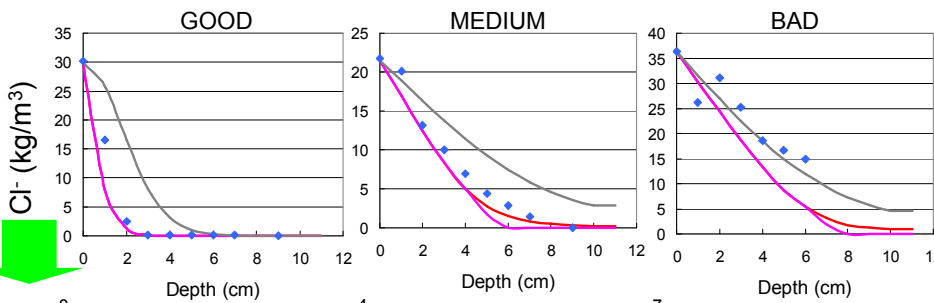
F (Fick) Conventional

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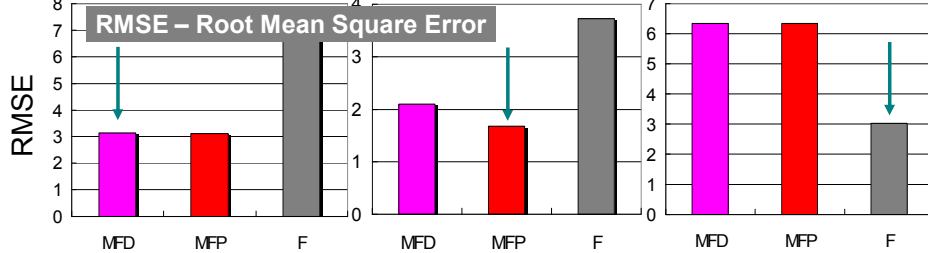
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[PROFILE BY DIFFERENT METHODS]

MFD MFP F Actual



Methods	Liquid Water Front (cm)	
	Mean	Standard Deviation
MFD	Actual	No
MFP	Actual	Actual
F	Independent of water front	



Method of analysis [MFD or MFP or F] selects based on RMSE from Actual data

[LCC BY DIFFERENT METHODS]

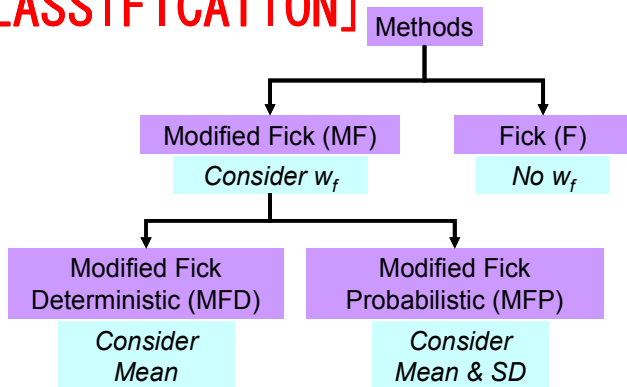
Type	Practical Engineer	Normalized cost by Methods			Desk Researcher	
	Cost				Considers Method (F)	Base Method
Bad	H	MFD	MFP	F Base	H	H
Medium	M	MFD	MFP Base	F	H	M
Good	L	MFD Base	MFP	F	H	L

Three types of concrete are analyzed by each of the three methods

The method that cause minimum RMSE shows the matching of LCC between two professionals

H – High Cost
M – Medium Cost
L – Low Cost

[CLASSIFICATION]



[CONCLUSION]

Suitable method of analysis based on durability classification of concrete can bridge up the gap between practical engineer and desk researchers