

# Publication of second revision of JSCE Recommendations for Concrete Pumping – 2012 Concrete Library No. 135

## 1. Introduction

The Recommendations for Concrete Pumping – 2012 by the Japan Society of Civil Engineers (JSCE) were published in June 2012 as publication No. 135 of the Concrete Library series. These recommendations, the second revision of the publication, prescribe the pumps to be used for transporting concrete and methodologies for placing the concrete. This report provides an overview of the history of these recommendations and changes made to them up to the present, as well as the key points of this revision.

## 2. History of the Recommendations

The original “Recommendations for Concrete Pumping, Concrete library No. 57” were introduced in 1985. The first revision was completed in 2000, as shown in Fig. 1, and published as No. 100 in the Concrete Library series. The first revision sold over 300 copies in 2010, second only to the Standard Specifications for Concrete Structures – 2007 although more than ten years have passed since original publication. The concrete pumping method presented in that revision is one of the most important basic techniques needed to construct better concrete structures.

The pumpability of concrete and the need for evaluation of trial mixes for pumpability have remained unchanged since the first revision. The new recommendations consist of guidelines for concrete pumping methods and they reference state-of-the-art reports covering the latest concrete pumping technology and techniques.



Fig. 1 Three Covers of original, first revision and second revision of the recommendations

## 3. Key Points of New Recommendations

The original and first revision dealt primarily with rigid pipelines. In the second revision’s “New Recommendations”, both rigid and flexible pipelines are discussed, as shown in Fig.2.

The second revision also addresses the following five points not addressed in the first revision:

1) Unification of the technical terminology and editing of the text and the commentary language to be consistent with the Recommendations for Practices of Placing Concrete by Pumping Methods by the



Rigid pipelines



Flexible pipelines

Fig. 2 Rigid and flexible pipelines

Architectural Institute of Japan (AIJ) and the Guideline 2009 of Concrete Pumping Method and Explanation by JCI, in order to clarify the situation for engineers and workers engaging in pumping concrete.

2) Improvement of the discussion of security and the environment.

Table 1 Mechanical Efficiency

Sort of aggregate	Slump (cm)	Piston Pump	Squeeze Pump
Normal aggregate	6-11	0.65-0.70	
	12-17	0.70-0.90	0.75-0.90
	18-21	0.85-0.90	0.85-0.90

Table 2 Working Efficiency

Sort of member for pumping concrete	Derivery by one truck agitator	Derivery by two truck agitators
Slab	0.56	0.85
Beam	0.50	0.75
Column and wall	0.45	0.65
Jonit and PC structures	0.40	0.40

3) Revision of the method used to select the number and type of concrete pumps, taking into account mechanical efficiency (or concrete pumping rate) and working efficiency (concrete delivery rate) for several types of construction as shown in Table 1 and Table 2. The procedure used to determine the number and type of pumps is shown in Fig. 3 and the relationship between working hours and the volume of concrete placed per day is shown in Fig. 4

4) Use of booms to support the concrete placing pipeline through which the discharge from the concrete pump passes. Materials are prescribed for cleaning and grouting the entire pipeline before concrete placing begins, and an improved description is given for placing concrete with a flexible hose nozzle hanging vertically to the horizontal floor on site.

5) Revision of the text and commentary language according to the Standard Specifications for Concrete Structures – 2007, Materials and Construction.

#### 4. Conclusions

The purpose of the second revision was to provide concrete pumping recommendations that are safer and more appropriate with regard to the environment. The recommendations also attempt to minimize misunderstanding and disagreement across the competent authorities, private company engineers, contractor engineers and workers engaged in actual pumping on real construction sites, while preserving the thoughtfulness and purpose of the original recommendations and the first revision.

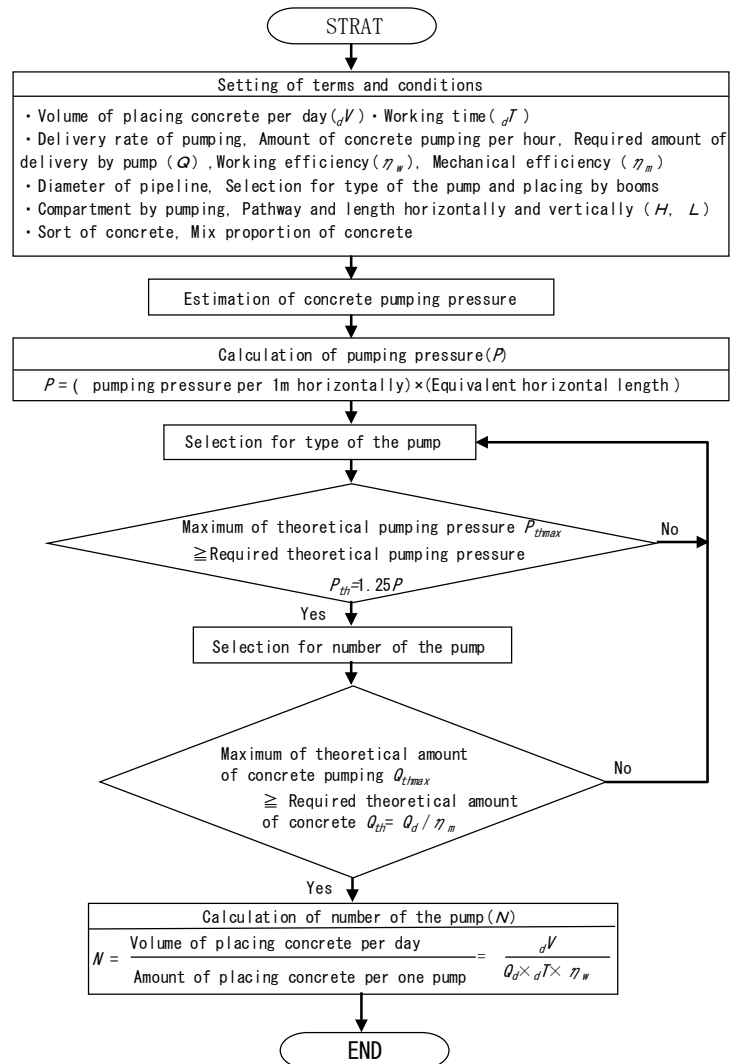


Fig. 3 Flow of decision of the number and type of the pump

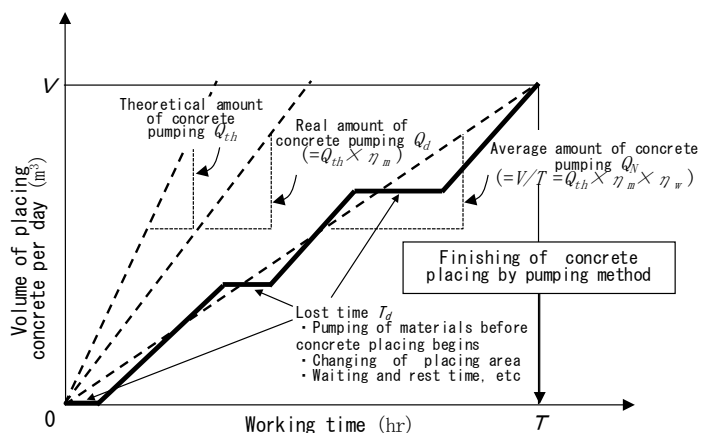


Fig. 4 Relationship between the working time and the volume of placing concrete per day