
DECISION SUPPORT SYSTEM FOR MAINTENANCE OF PIERS STRUCTURE

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ABSTRACT

Maintenance of piers structures in harbor was absolutely required to be taken by the management in order to ensure and facilitate ships' activities. It is used in order to keep the structures in good condition during their planned service life. The objective of this study is to construct a structure evaluation method or system, which is for piers structures, by obtaining each score of the piers structure component and providing alternatives for allocated maintenance fund that gives priority based on the component score. The score was obtained by using the Analytical Hierarchy Process (AHP) as a supporting method.

The AHP method was used for obtaining score for the 2nd level criteria, such as the structural, functional, architectural, and cost; as well as for the piers structure components, such as pile, apron pavement, fender, bollard, pile, printed concrete, bulkhead, and catodic protection.

The results of the scoring shown:

$$Y_{\text{Piers Structure}} = 0,554.STR + 0,248.FGS + 0,126.ARS + 0,073.BIA$$

$$Y_{\text{Piers Structures}} = 0,197.TP + 0,169.PA + 0,147.FD + 0,137.BL + 0,139.TB + 0,059.BC + 0,092.TR + 0,059.KP$$

After these results were applied and tested to the piers structure, the followings showed the resulted scores:

- a. Dermaga Samudera for Tanjung Emas Harbor in Semarang showed an index of 6.585 (given by the researcher) and 6.554 (score based on the questionnaire). These figures showed that the piers structure was considered in "fair" category.*
- b. Dermaga Terminal Peti Kemas in Semarang showed an index of 7.328 (score given by the researcher) and 7.544 (score based on the questionnaire). These figures indicated that the piers structure was categorized as "fair".*
- c. Piers Structure in Sampit Harbor showed an index of 7.491 (score given by the researcher) and 7.50 (score based on questionnaire). These features showed that the piers structure was categorized as "fair".*

Keywords: *Piers Structure, Analytical Hierarchy Process (AHP), score, index condition*