

## CHAPTER VI

### CONCLUSION AND RECOMMENDATION

#### 6.1. Conclusion

The FAO (1992) in “A New Approach to Sediment Transport in the Design and Operation of Irrigation Canals” states that a profitable and sustainable agricultural production needs an irrigation network that brings water from the source to the fields at the right place, at the right time, in the right quantity, and at the right level. While the problem occurs in the S.15 Ka and S.16 Ka fields (Siti Adi Village, Purwoharjo Village, and Tukung Gedong Village) is the farmers cannot grow their paddy at the same time with the farmers in other fields located in the same group. This problem usually occurs on the early Growing Season 2 of Group I in which those fields are located. For about 2 weeks, the farmers cannot start their soil cultivation in the right time (based on schedule).

Referring to design documents, several deviations were found in the fields. However, analysis that has been conducted showed no significant impact of those deviations to the problem. In fact, the water availability is the main cause of this problem.

In April 1 (first two weeks of April), the required discharge was **11.36 m<sup>3</sup>/s**. That discharge will be used for soil cultivation of Group II, soil cultivation of Group III, and Growth 1 of Group I whereas the operational report from UPTD Unit Sumber Daya Air Kedungsamak (Appendix B), the

highest discharge in April 1, 2012 was  $3.613+3.134 = \mathbf{6.747}$  m<sup>3</sup>/s. It means that Kedungsamak Primary Canal and West Wadaslintang Primary Canal cannot flow sufficient amount of water required by all fields in Kedungsamak Irrigation Area which they should do, i.e.  $11.36 \times 1.18 \times 1.11 = \mathbf{14.88}$  m<sup>3</sup>/s.

The highest discharge that should be provided by Sentul Secondary Canal in the existing condition ( $\mathbf{4.52}$  m<sup>3</sup>/s) is compared to the maximum design discharge ( $\mathbf{2.57}$  m<sup>3</sup>/s). It shows that the discharge in the existing condition is almost twice of the design one. On the other hand, the existing area served by Sentul Secondary Canal is **1918** Ha and the design area is **1878** Ha.

Relating to the results of water surface profile calculation, the existing canal slope in Segment 11 of Sentul Secondary Canal is not a problem because the water is still flowing from upstream to downstream. Even if the upward slope is assumed as downward one, the water surface profile shows that the water will still flow, but the water height is lower which means the discharge will be lower. Therefore, the improper slope in Segment 11 of Sentul Secondary Canal is not the cause of problem.

The total discharge of Segment 11 of Sentul Secondary Canal on 9<sup>th</sup> June 2012 was  $0.8 \text{ m}^3/\text{s} - 0.03386 \text{ m}^3/\text{s} = \mathbf{0.76614}$  m<sup>3</sup>/s. In fact, the required discharge of downstream fields after the flume (S.11 Ka, S.12 Ka, S.13 Ka, S.14 Ka, S.15 Ka, and S.16 Ka) is  $\mathbf{0.761}$  m<sup>3</sup>/s. Thus, the problematic fields will still get sufficient amount of water although there are some cracks at the

Flume 11c. It shows that the leakages happen at the upstream and downstream ends of Flume 11c is not the cause of problem.

## 6.2. Recommendation

Dealing with the water availability, the officers who are responsible for Kedungsamak Irrigation Area should re-calculate the water allocation based on the existing condition. The rainfall pattern and other factors might be different or changed, i.e. evaporation, variety of the crops, and total area of the fields. The water availability is currently far different from the design one. On 1<sup>st</sup> April 2012, West Wadaslintang Primary Canal and Kedungsamak Intake are supposed to provide **14.88** m<sup>3</sup>/s, but they just flowed **6.747** m<sup>3</sup>/s in the existing condition.

The application of grouping system modification might reduce peak diversion requirement. There are 3 (three) groups of Kedungsamak Irrigation Area. Dividing the fields into more groups (i.e. up to five groups) is recommended. This recommendation cannot be discussed further because there is limitation of data, i.e. no rainfall data, but the sketch is shown in Figure 6.1.



Figure 6.1. shows that Kedungsamak irrigation area is divided into five groups. They are Group I (1358 ha), Group II (1461 ha), Group III (1151 ha), Group IV (1349 ha), and Group V (1439 ha).

The leakages happen at the upstream and downstream ends because the bond between the canal lining (stone masonry) and the old flume (concrete) is getting weaker. The discharge through cracks of Flume 11c in Segment 11 of Sentul Secondary Canal is  $0.03386 \text{ m}^3/\text{s}$ . Therefore, the Flume 11c should be “sealed with rubber sheets to ensure no leakage from the sides” (Alhamid, 1996). Constructing a new flume is suggested if there is fund.

The Government should support the farmers by providing a good irrigation system. The Government and farmers should maintain the irrigation structures regularly in order to prevent any damages.

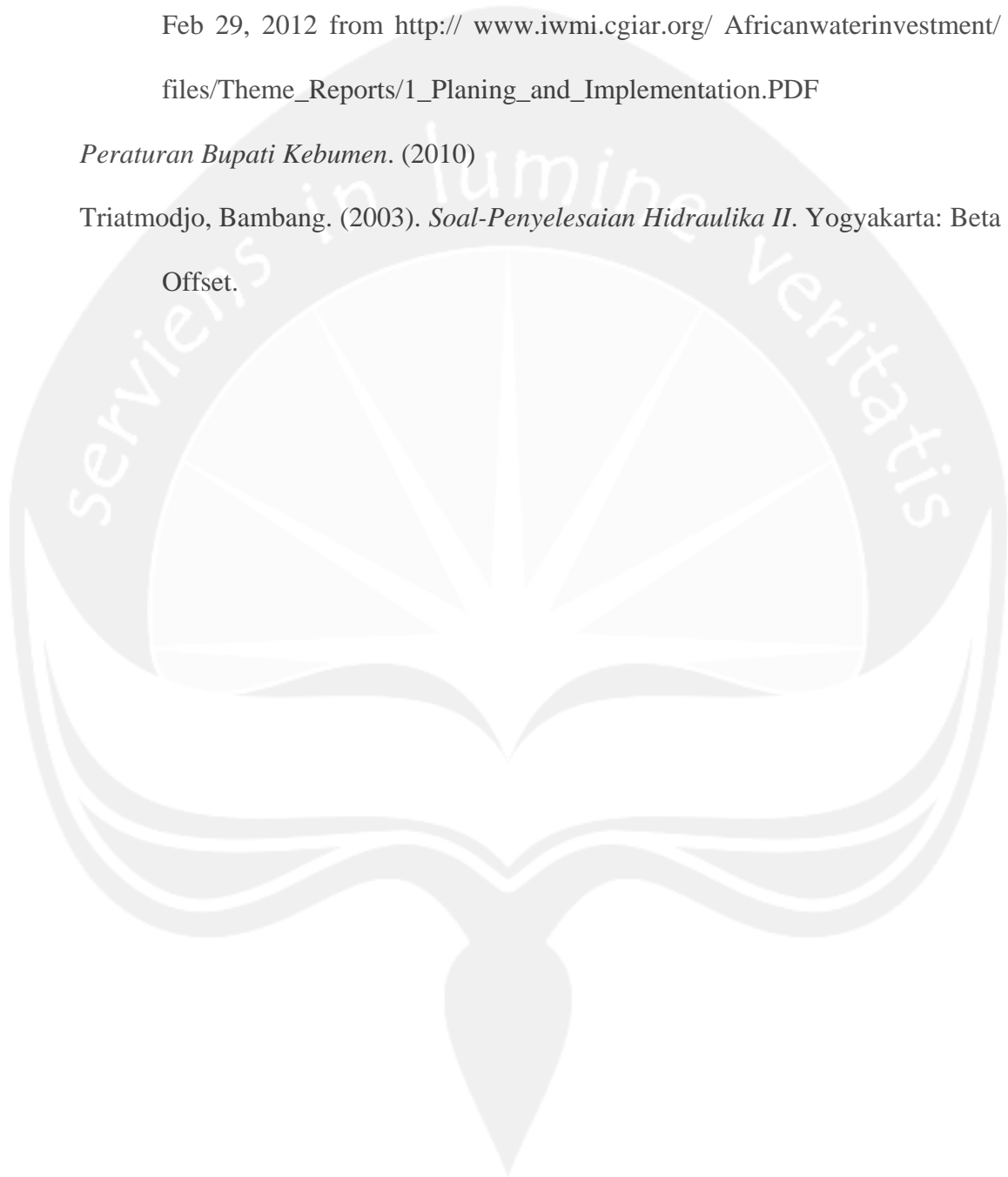
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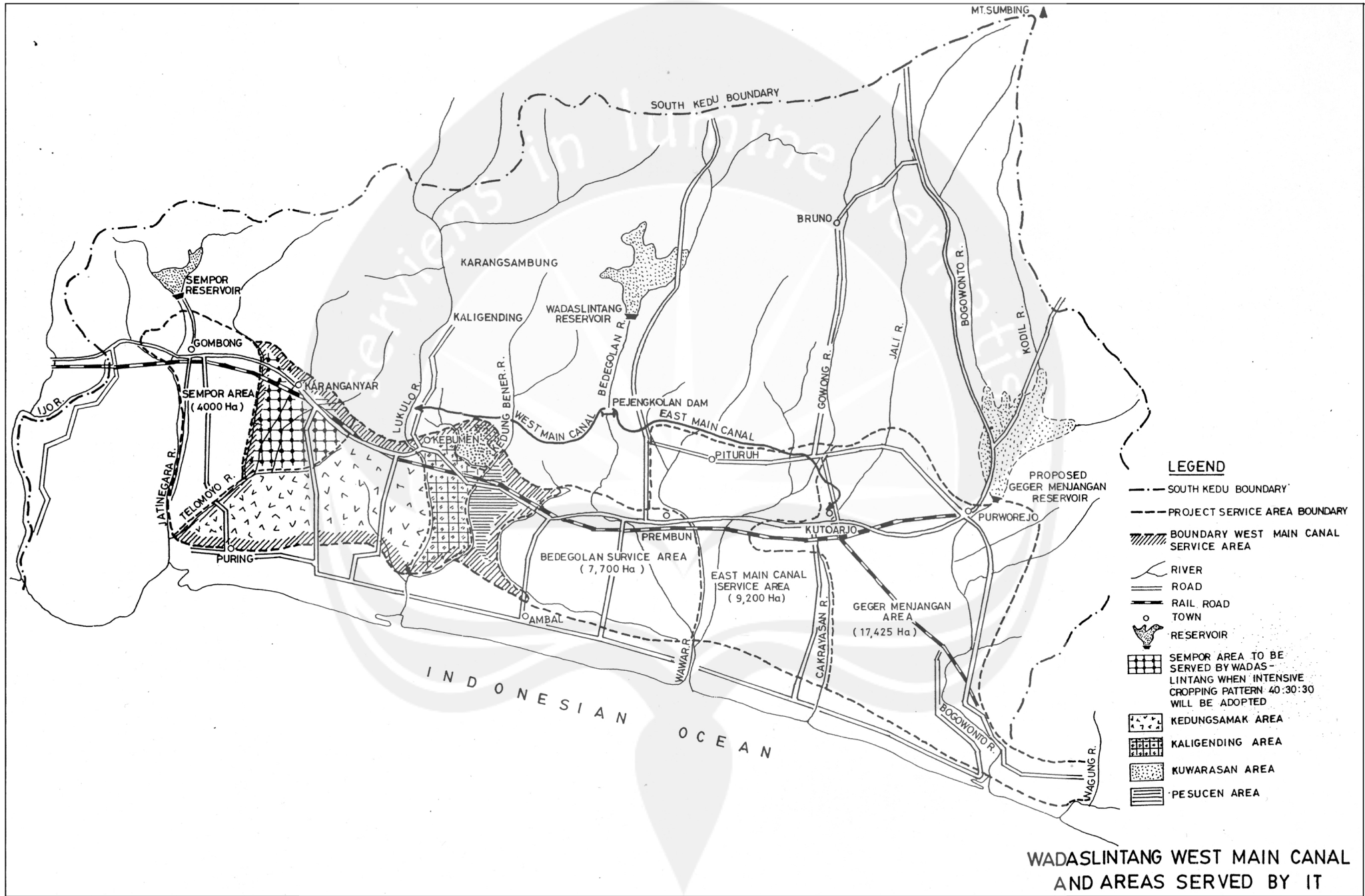
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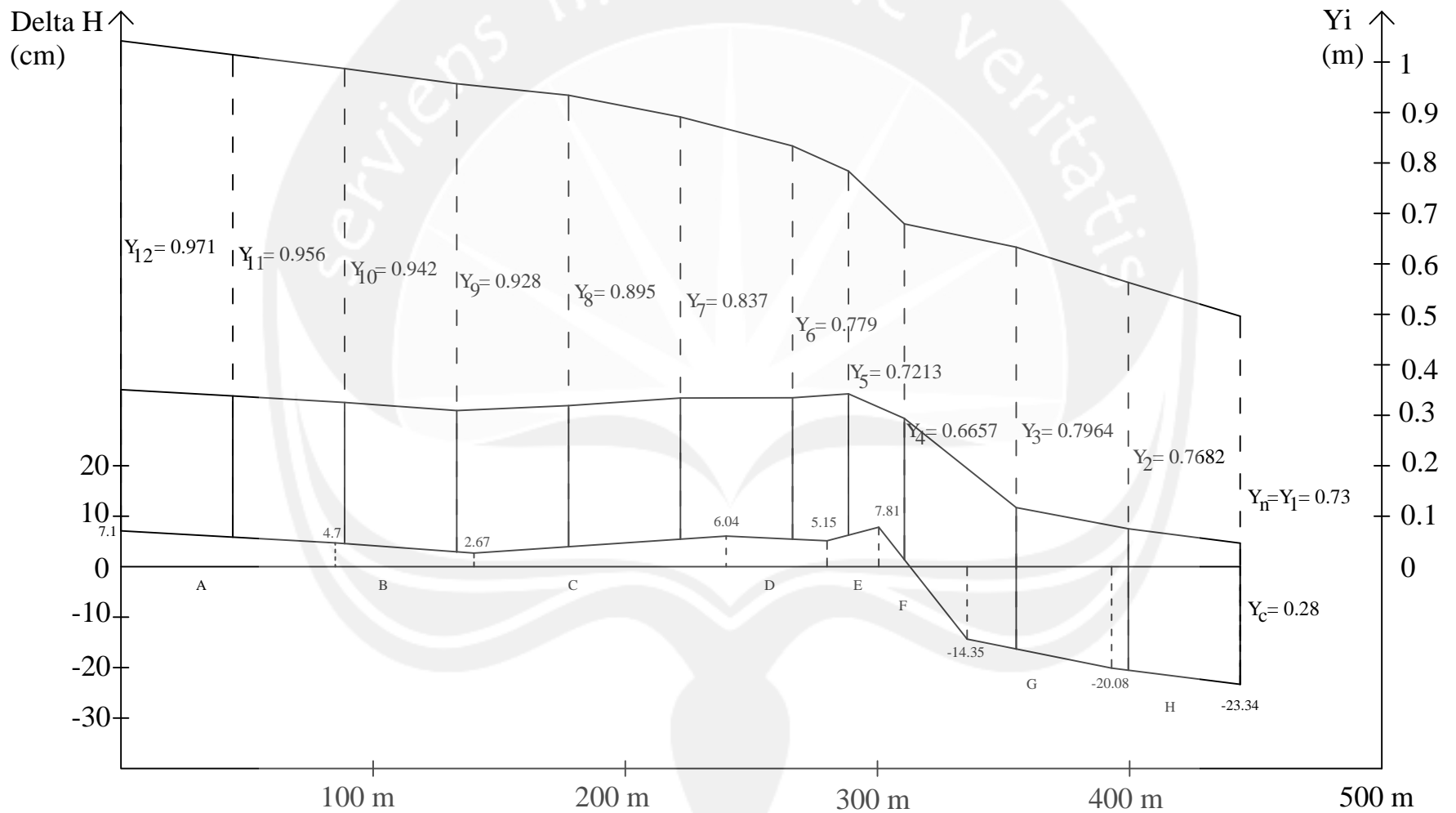




- LEGEND**
- SOUTH KEDU BOUNDARY
  - - - PROJECT SERVICE AREA BOUNDARY
  - ▨ BOUNDARY WEST MAIN CANAL SERVICE AREA
  - ~ RIVER
  - == ROAD
  - RAIL ROAD
  - TOWN
  - ◊ RESERVOIR
  - ▣ SEMPOR AREA TO BE SERVED BY WADASLINTANG WHEN INTENSIVE CROPPING PATTERN 40:30:30 WILL BE ADOPTED
  - ▤ KEDUNGSAMAK AREA
  - ▥ KALIGENDING AREA
  - ▦ KUWARASAN AREA
  - ▧ PESUCEN AREA

WADASLINTANG WEST MAIN CANAL AND AREAS SERVED BY IT





Scale  
H=1:20; V=10:1

Figure 5.1. Water surface profile of Segment 11, Sentul Secondary Canal