Indian Standard

CODE OF PRACTICE FOR MEASUREMENT OF SEEPAGE LOSSES FROM CANALS

PART II INFLOW-OUTFLOW METHOD

1. SCOPE

1.1 This standard (Part II) deals with measurement of seepage losses in open canals by inflow-outflow method.

FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 30 January 1980, after the draft finalized by the Canals and Canal Linings Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Irrigation project design, operation and maintenance, and canal lining research and development require accurate and economical measurement of seepage rates. The possible benefits from canal lining are saving in water, elimination of water logging, and reduction in ~maintenance cost. Hence, correct assessment of seepage losses from unlined canals is very important for evaluation of benefits from lining and field observations are the best means to make realistic assessment.

0.3 The loss of water by seepage from unlined canals in India generally varies from 0.3 to 7.0 $m^3/s/10^6$ m^2 depending on the permeability of soil through which the canal passes, location of water table, distance of drainage, bed width, side slope and water depth inside the canal. In addition, flow velocity, soil and water temperature, atmospheric pressure and stratification of the underlying soil also affect the seepage rate.

0.4 The seepage losses from unlined canals can be calculated by analytical methods or determined by direct measurements on the canals. The analytical calculations of seepage losses based on coefficient of hydraulic conductivity of soil and the boundary conditions of the flow system, are of particular value for the canals which are in the planning stage. The method of direct measurement of seepage losses are applicable to the existing canals.

0.5 Currently, accepted methods for direct measurement of seepage losses from existing canals are the inflow-outflow, ponding and seepage meter. In addition, there are special methods such as tracer technique, electrical logging or resistivity measurement, piezometric surveys and remote sensing. The inflow-outflow and ponding methods are applicable regardless of canalor soil conditions. The seepage meter cannot be used where the channel has rocky bottom or heavy weed growth. The tracer technique is best , suited to canals in homogeneous and istropic formations.

0.5.1 The code of practice for measurement of seepage losses from canals is being published in two parts, Part I dealing with ponding method and Part II dealing with inflow-outflow method.

0.6 Valuable assistance has been rendered by Dr A. S. Chawla, Professor, Water Resources Development and Training Centre, Roorkee in the preparation of this standard.