STRESS ANALYSIS OF LAYERED FOLDED PLATES RESTING ON ELASTIC FOUNDATION: APPLICATION TO CANAL LINING

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ABSTRACT

The lining of canal is an important feature of irrigation projects as it improves the flow characterizes and minimized the loss of water due to seepage. Lining is an impermeable layer provided for the bed and sides of canal. Selection of a particular type of lining, keeping in consideration the general requirements, as well as site specific requirements including structural stability, economy, availability of construction materials, machinery and equipment, skilled and unskilled labor, subsequent repeatability, ability to prevent weed growth, resistance against burrowing animals, structural stability during and after construction. The water lost through seepage in an unlined canal can be saved by construction of appropriate canal lining. The rigid lining, semi-rigid lining, flexible lining and combination lining. Combination lining includes Geo-membrane with Geo-textile in the old and new concrete line on sides, selecting the type of lining. The type of lining selected should not only e economics in initial cost, but also in repair and maintenance cost.

The cylindrical bending of elastic plates subjected to the mechanical transverse loading response under plain strain condition a complete analytical solution is presented for the cylindrical bending of multilayered orthotropic plates with simply supported edge conditions based on resister mandolin's first order shear deformation theory (FOST) gives an analytical solution of numerical investigation for normalized transverse displacement (w) are validate with ABAQUS SOFTWARE. The type of soils with various sub grade reactions plays an important role for cracks and buckled with deflection and stress at canal lining bed and side slopes of canal.

The study evaluate at Dudhganga Right Bank Canal, District Kolhapur, Maharashtra, India for exiting M10 concrete lining and composite geo-membrane with geo-textile and new concrete layer for canal lining. There is no seepage loss of water after provision of composite geo-membrane lining. The deflection and stress calculate with ABAQUS Software various types of soils and types of concrete exiting and newly composite geo-membrane lining. The loading applied with hydrostatic load, empty condition, pot holes and erosion. The deflection and stress should be maximum in Black cotton soil, Murum, sandy and loose soils as compared to clayey soil and hard rock.

KEYWORDS: *Canal Lining, Flexible Lining, Combination Lining, Geo-Membrane, Geo-Textile, Types of Soils, Cylindrical Bending, Deflection, Stress, ABAQUS Software, Hydrostatic Load, Empty Condition, Pot Holes, Erosion. Seepage, Maintenance and Economy*