compatibility equations expressed in terms of stress, to obtain, after algebraic processes, the fourth order ordinary differential equation (ODE) – Equation (31) – expressed in terms of the vertical stress fields in the exponential Fourier transform space. The exponential Fourier transformation was similarly applied to the boundary conditions to obtain the boundary conditions expressed in the exponential Fourier transform space as Equations (34) and (35). The fourth order ODE for $\bar{\sigma}_{zz}(\lambda, z)$, vertical stress in the exponential Fourier transform space, was solved using the method of undetermined parameters to obtain the general solution given as Equation (39). The requirements for boundedness of the stresses were used to obtain the bounded solutions for $\bar{\sigma}_{zz}(\lambda, z)$ as Equation (42). The other stresses $\bar{\tau}_{xz}(\lambda, z)$, $\bar{\sigma}_{xx}(\lambda, z)$, in the exponential transform space were obtained from Equation (42) using Equations (21) and (24), as Equations (46) and (49), respectively. Enforcement of boundary conditions yielded the unknown constants of integration as Equations (51) and (55). Thus the stresses become completely determined as Equations (56), (58) and (60) in the exponential transform space variables. Inversion of the exponential transforms for the stresses gave the general expressions for stresses in the physical domain space variables as Equations (67), (74) and (77).

Particular problems of elastic half plane problems under vertical and horizontal point loads at the origin, O, were considered. The stress fields for elastic half plane problems under combined vertical and horizontal point loads applied at the origin were found as Equations (82), (85) and (88). The stress fields for elastic half plane problems under vertical point load applied at the origin were found as Equations (89-91). The stress fields for elastic half plane problems under horizontal point load applied at the origin were found as Equations (92-94). Similarly, the specific problem of an elastic half plane under uniformly distributed line load p_0 applied to one side of the *x*-axis was considered and the stress fields were obtained as Equations (105-107). It was observed that the expressions obtained were identical with expressions obtained by other researchers who used other methods of solution.

CONCLUSIONS

The conclusions of this study are as follows:

(i) The exponential Fourier transform method has been successfully used in this paper to obtain general solutions for the stresses in a linear elastic, isotropic, homogeneous soil medium in the *xz* coordinate plane under boundary loads.

(ii) The exponential Fourier transform method has been successfully implemented in this paper to find solutions for stresses in elastic half plane media due to line loads of constant intensity acting along the *x* axis.

(iii) The exponential Fourier transform method has been successfully implemented in this work to find stresses due to vertical and horizontal point loads applied at the origin O of an elastic half plane medium (on the *xz* coordinate plane) considered linear elastic, isotropic and homogeneous.

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