Oscillatory flow along a rough boundary is a fundamental component in a range of oceanographic processes due to tidal and wave forcing. Laboratory experiments examining the oscillating flow over a 2D region of roughness of finite extent suggest mechanisms for increased transfer of mass and momentum. Particle imaging velocimetry along with flow visualization reveal that large scale residual patterns are generated near the region of roughness. Two flow regimes are observed for differing ratios of along-boundary excursion length, L, to the length of the roughness region, D. For \( L/D > 0.5 \), a weak inflow is produced in the vicinity of the roughness region, with a corresponding along-boundary flow away from the region. For \( L/D < 0.5 \), a strong outflow jet is established near the center of the roughness region. The two flow regimes result from flow structure interactions and rely on eddies being long-lived relative to the period of oscillation. A phenomenological model is developed that accounts for the contrasting flow regimes. Effects of stratification and slope on flow structure are examined using a numerical model.