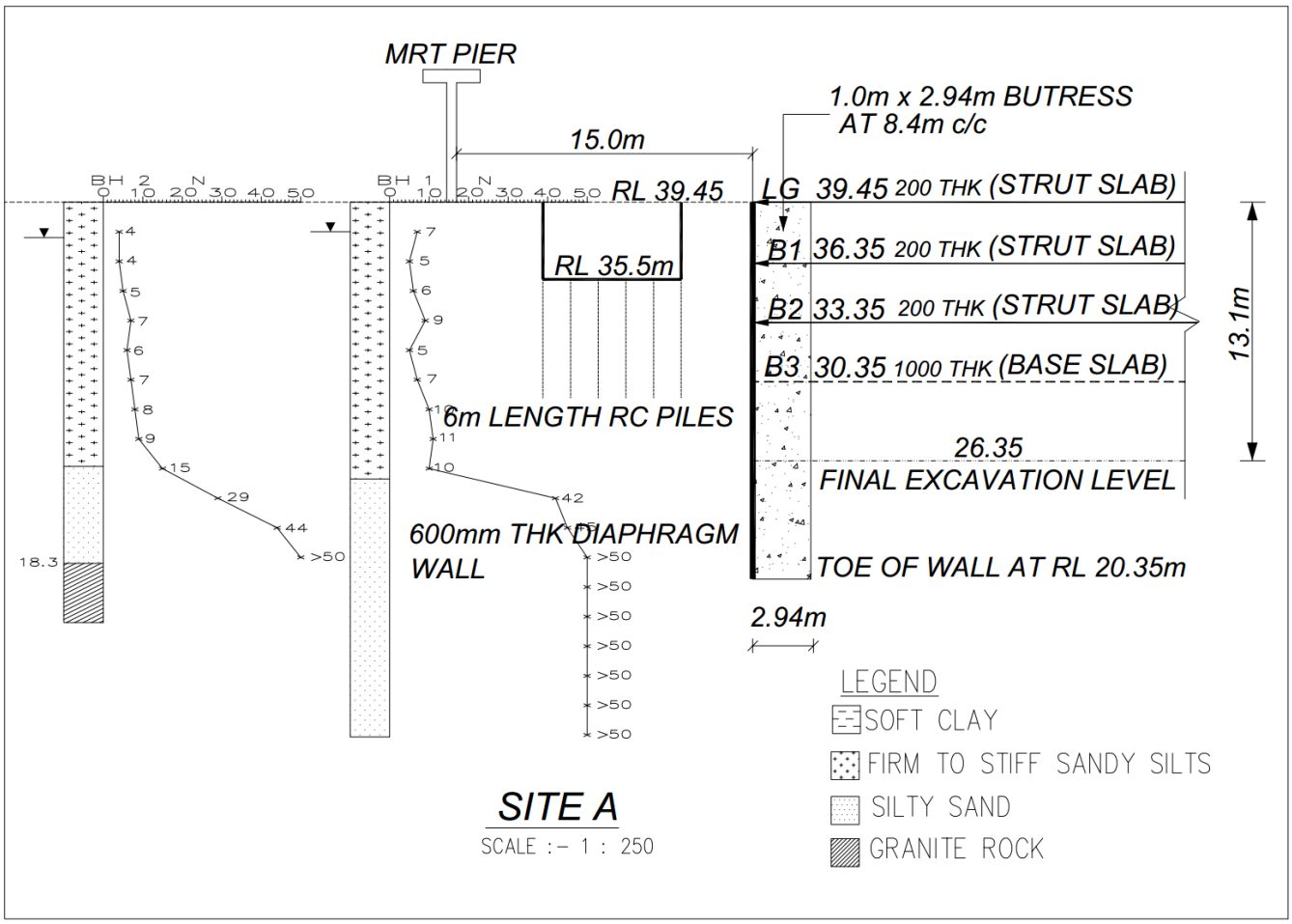


FIGURE 1A CROSS SECTION AT SITE A

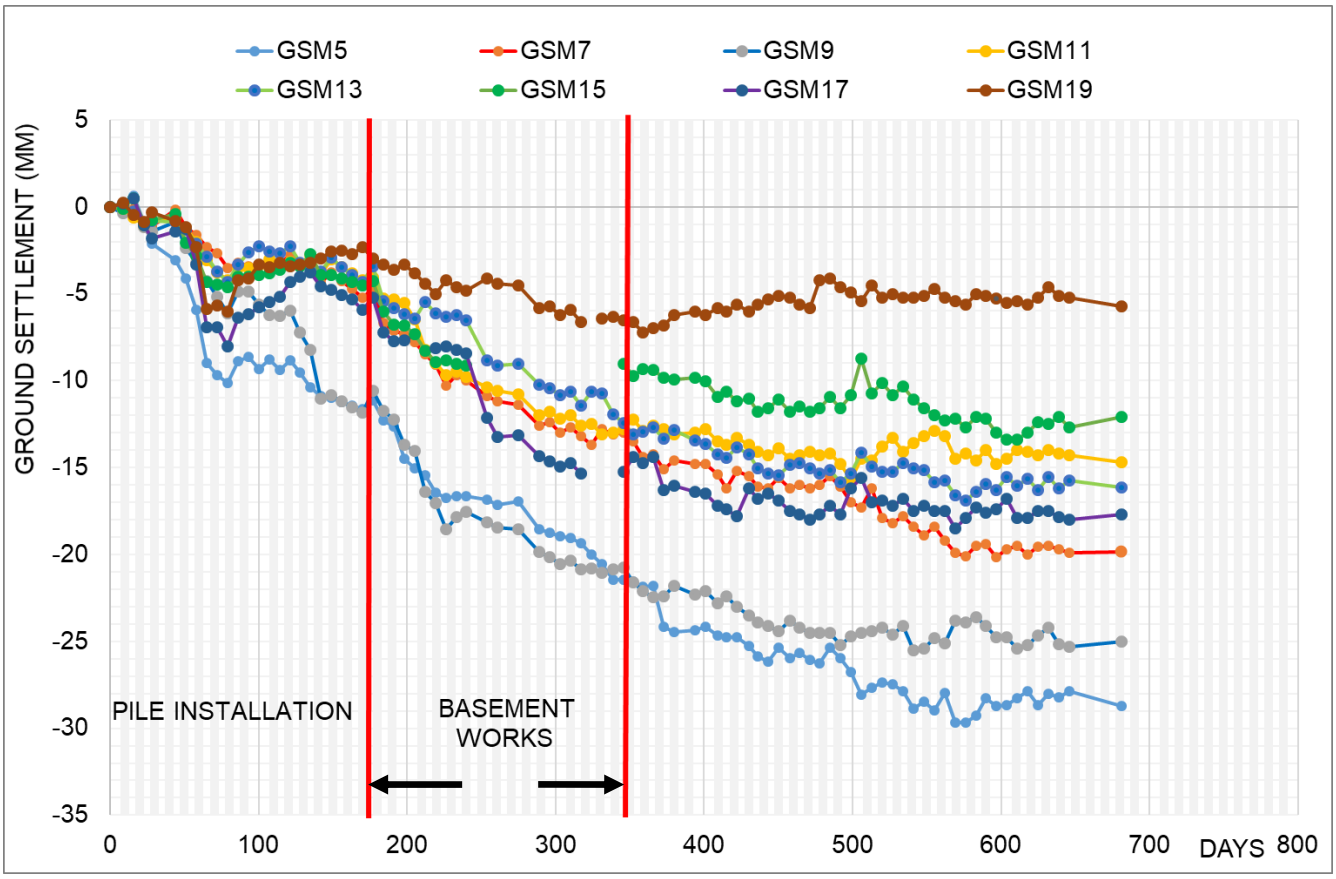


FIGURE 1B SITE A. GROUND SETTLEMENT MARKERS BENEATH MRT PIERS

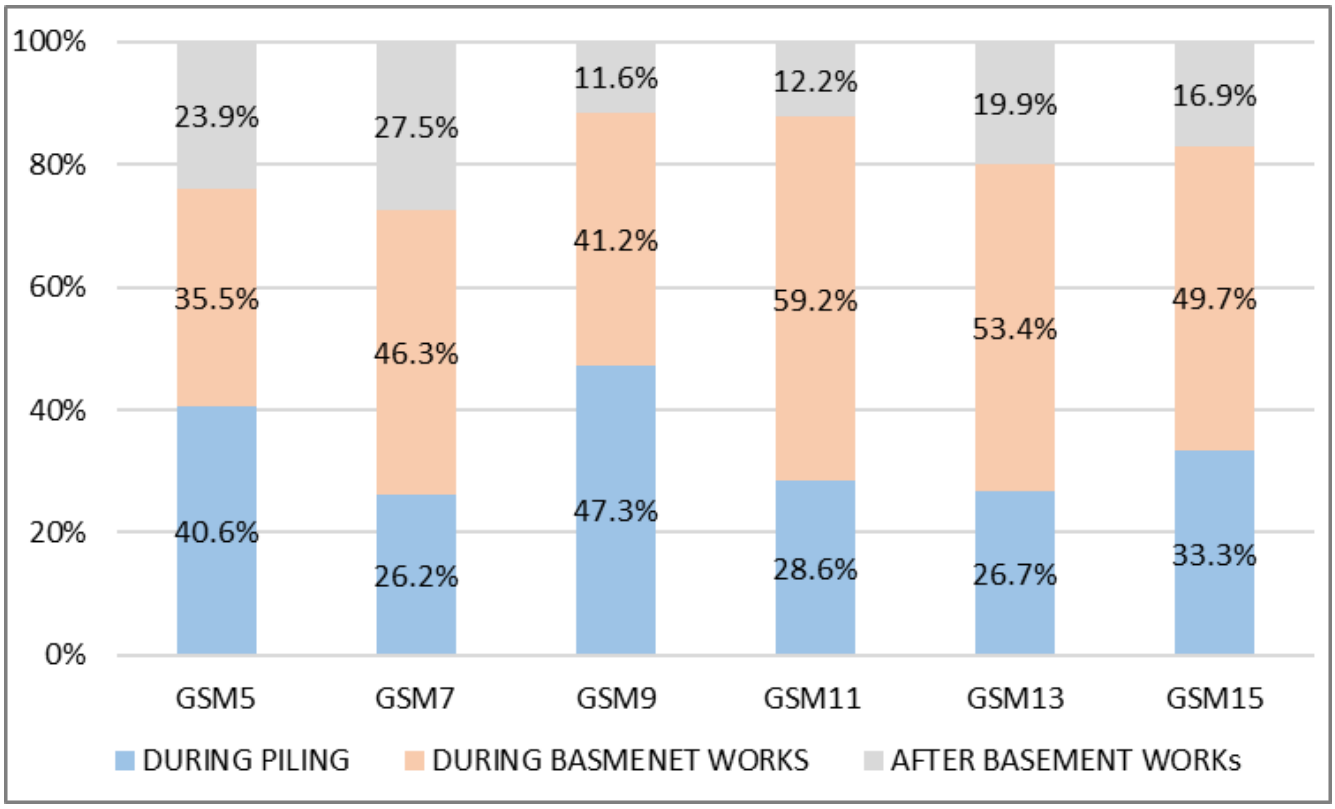


FIGURE 1C COMPONENTS OF SETTLEMENT AT 15 M FROM D-WALL

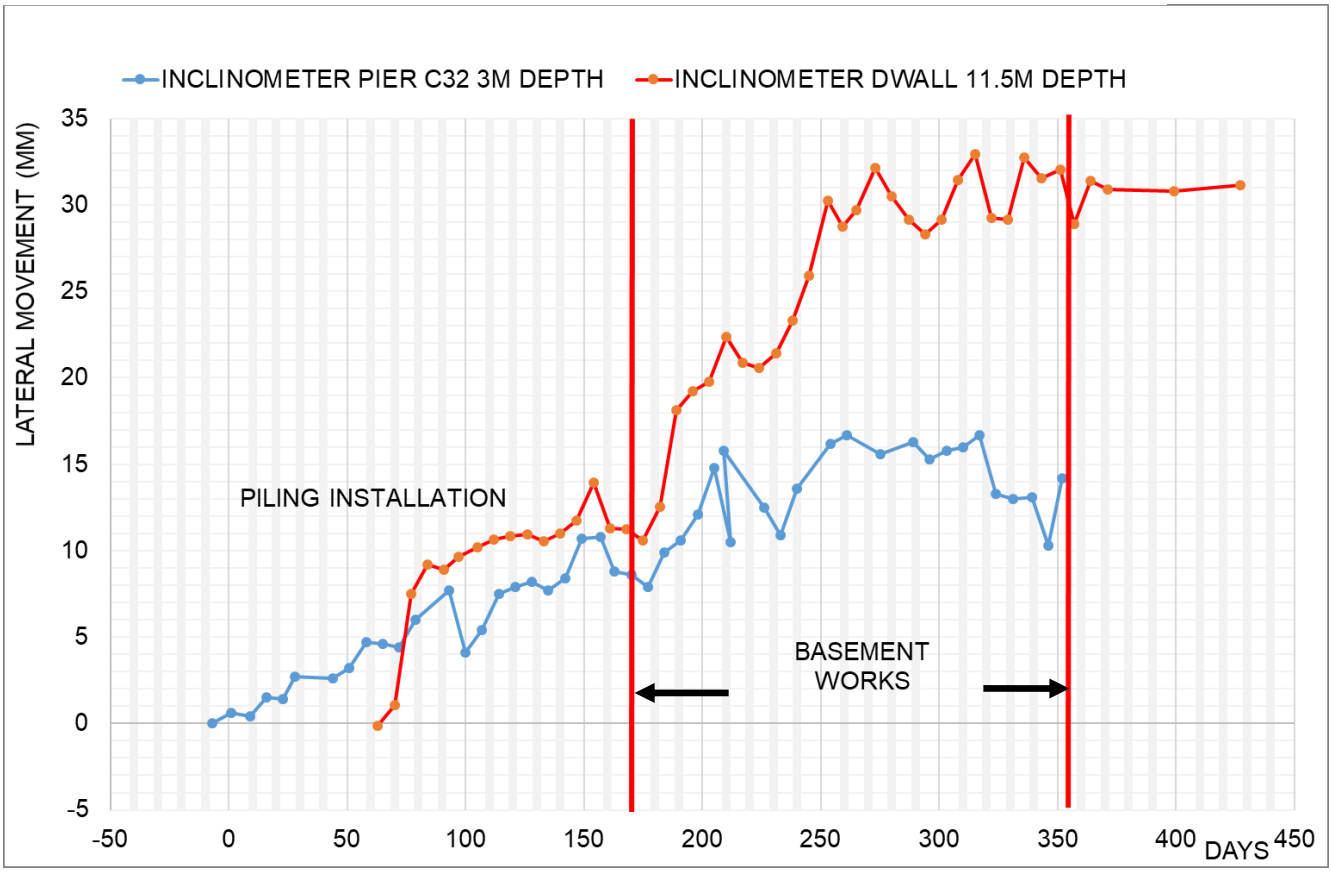


FIGURE 1D SITE A. PIER C32 LATERAL MOVEMENT OVER TIME

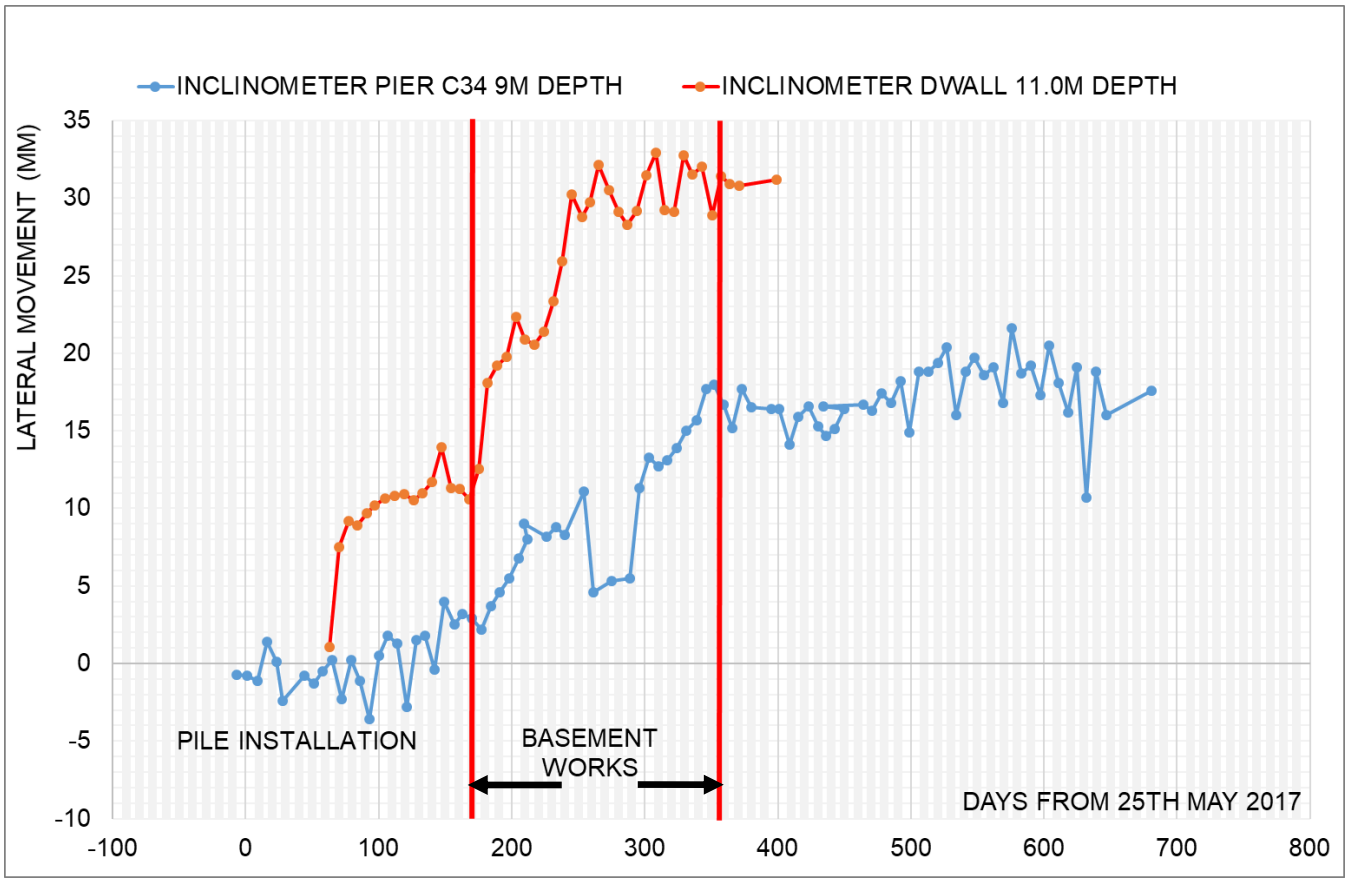


FIGURE 1E SITE A. PIER C34 LATERAL MOVEMENT OVER TIME

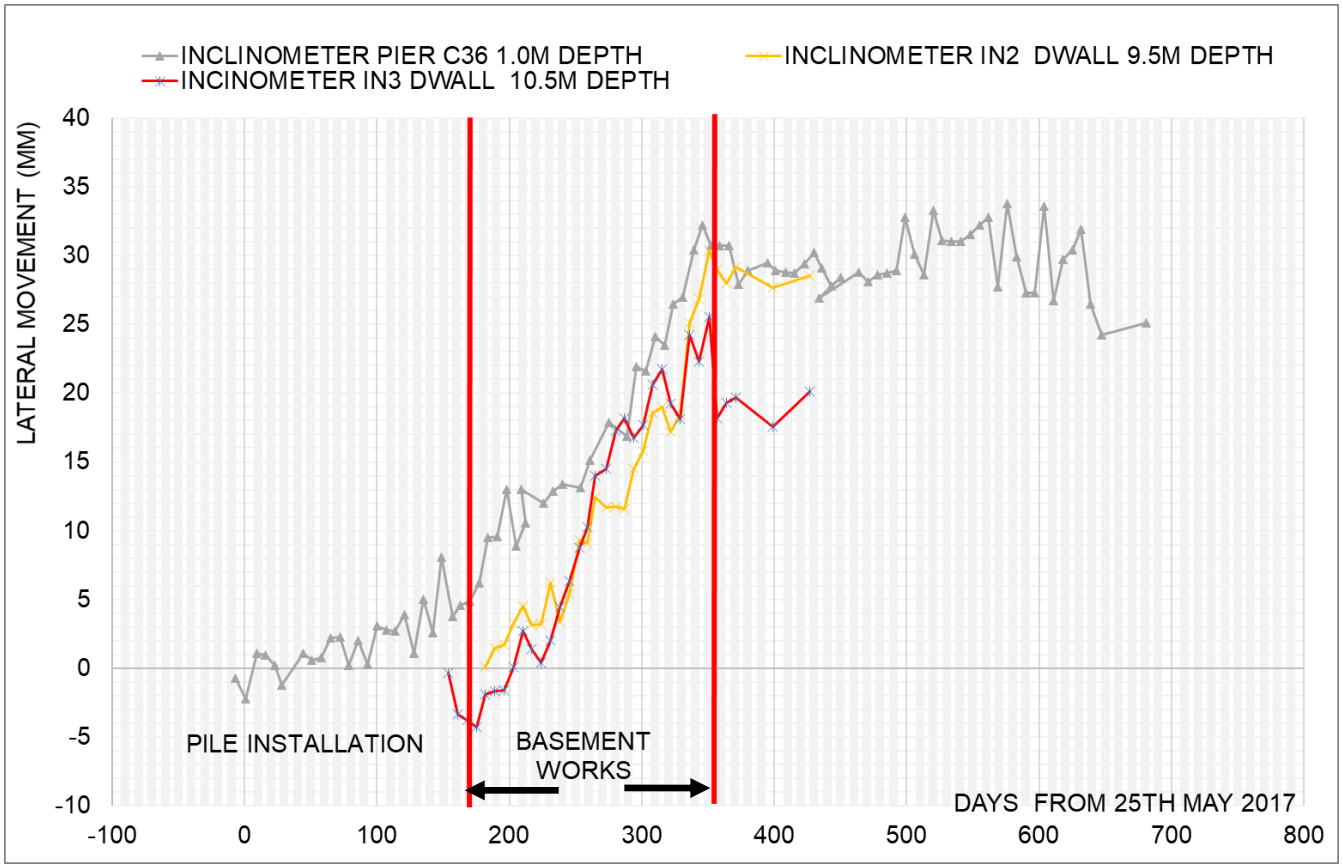


FIGURE 1F SITE A. PIER C36 LATERAL MOVEMENT OVER TIME

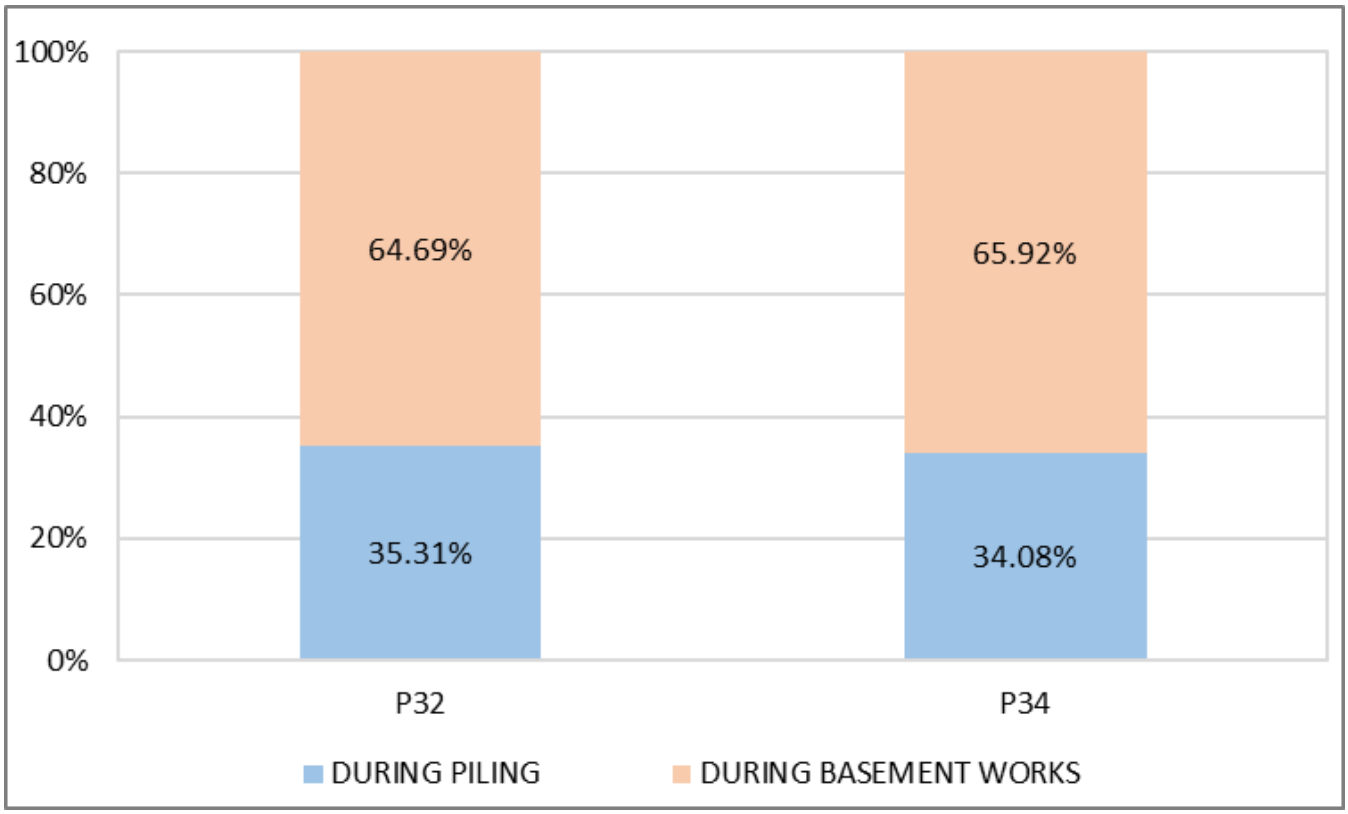


FIGURE 1G SITE A. PROPORTIONS OF LATERAL MOVEMENTS FROM INCLINOMETERS WITHIN D-WALL

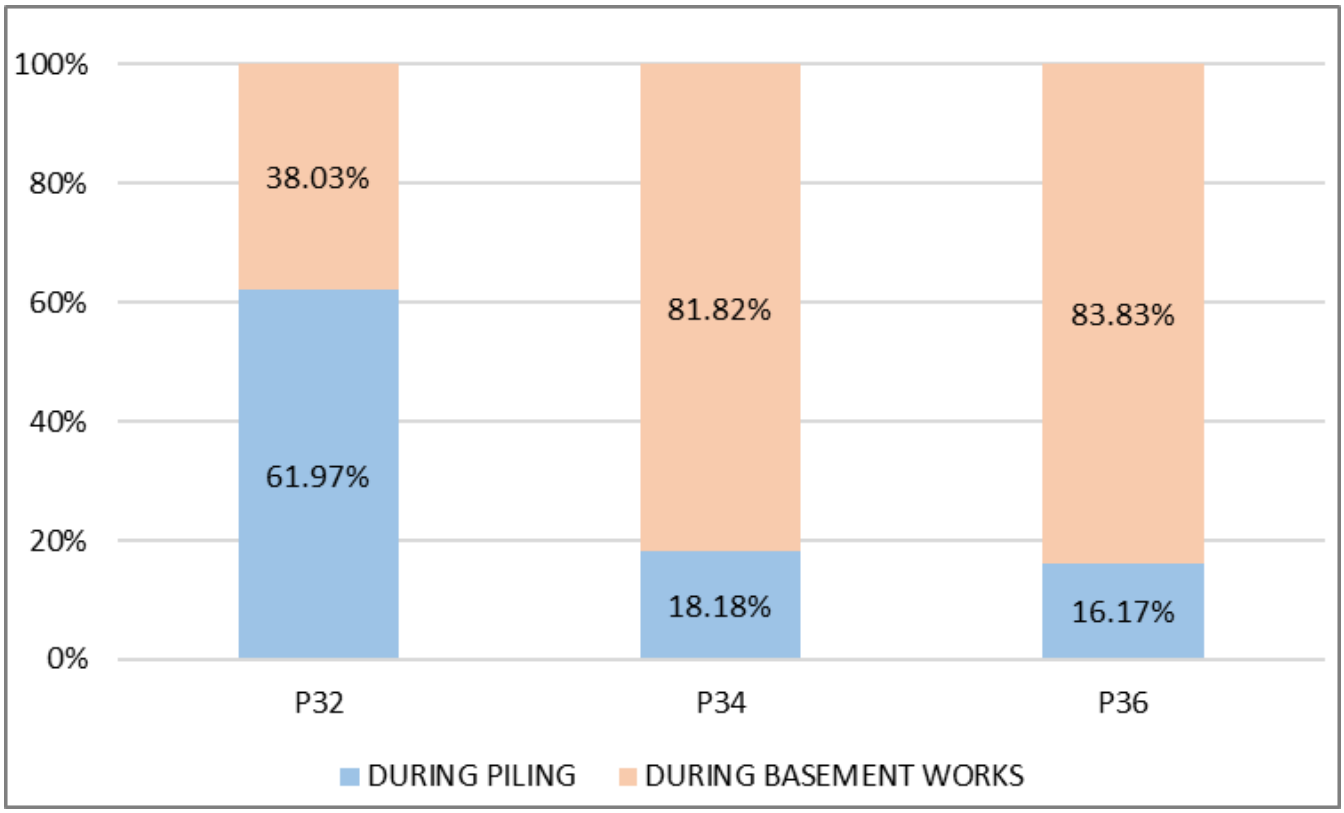


FIGURE 1H SITE A. PROPORTIONS OF LATERAL MOVEMENTS FROM INCLINOMETERS NEXT TO MRT PIERS 15 M FROM D-WALL

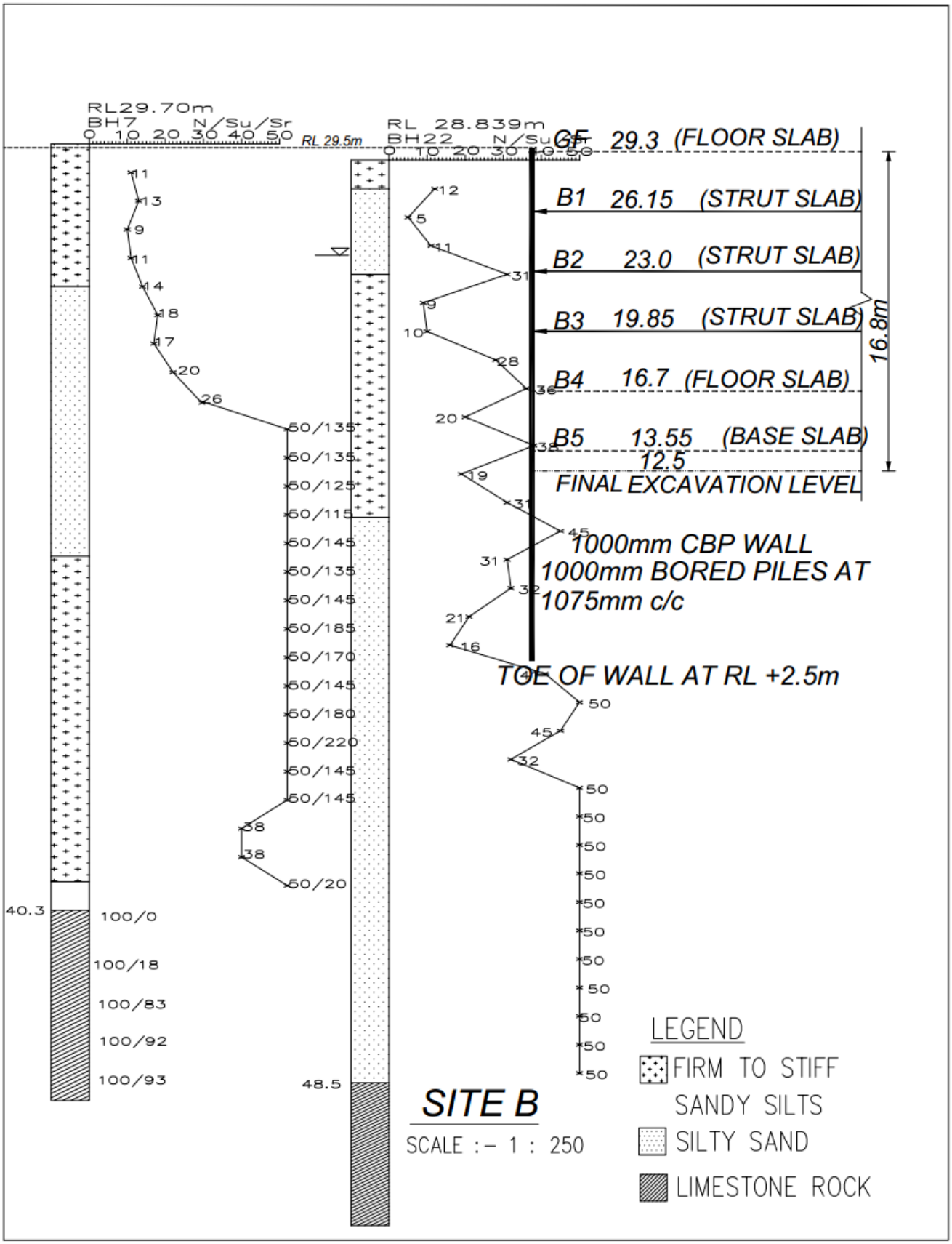


FIGURE 2A CROSS SECTION AT SITE B

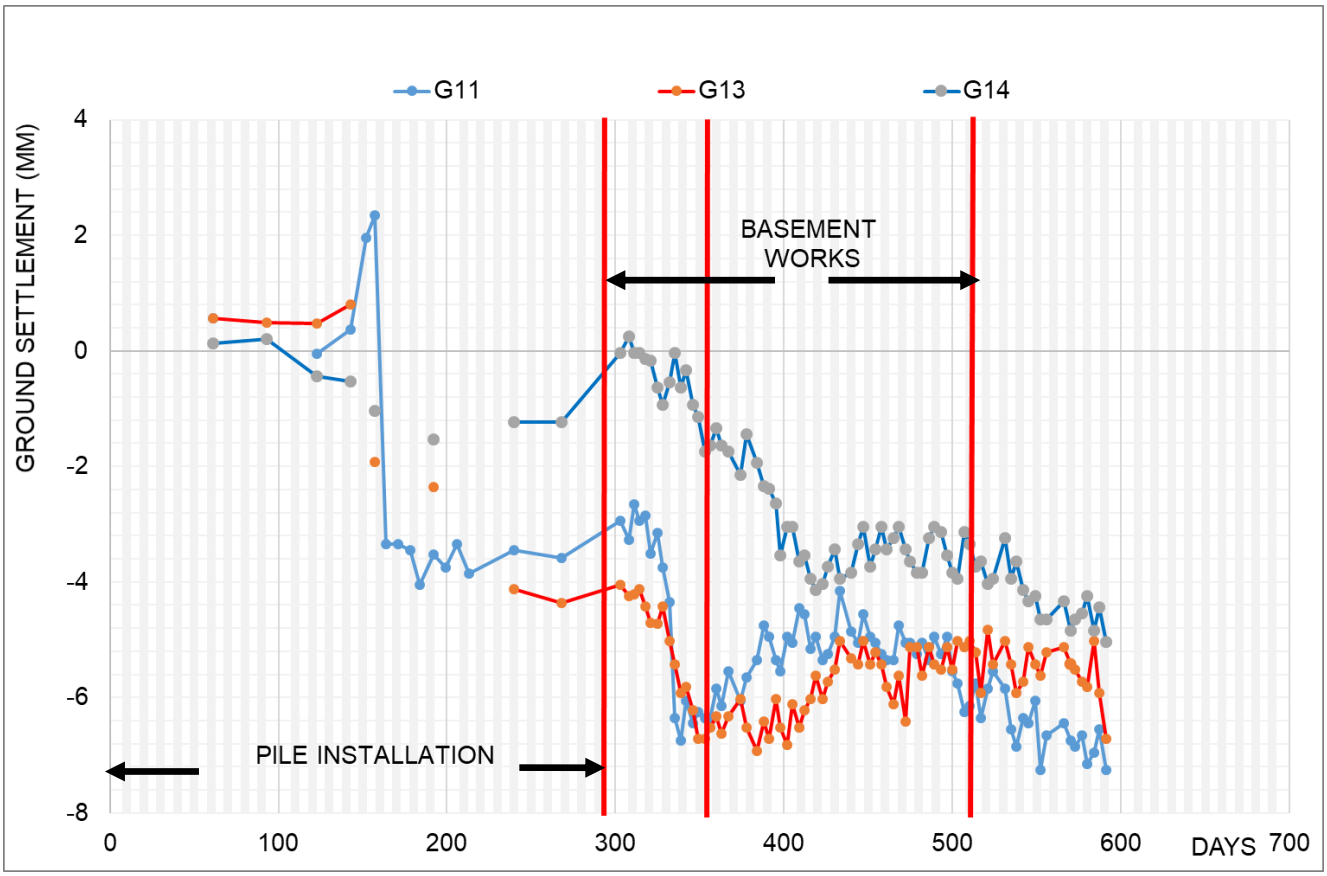


FIGURE 2B SITE B. GROUND SETTLEMENT

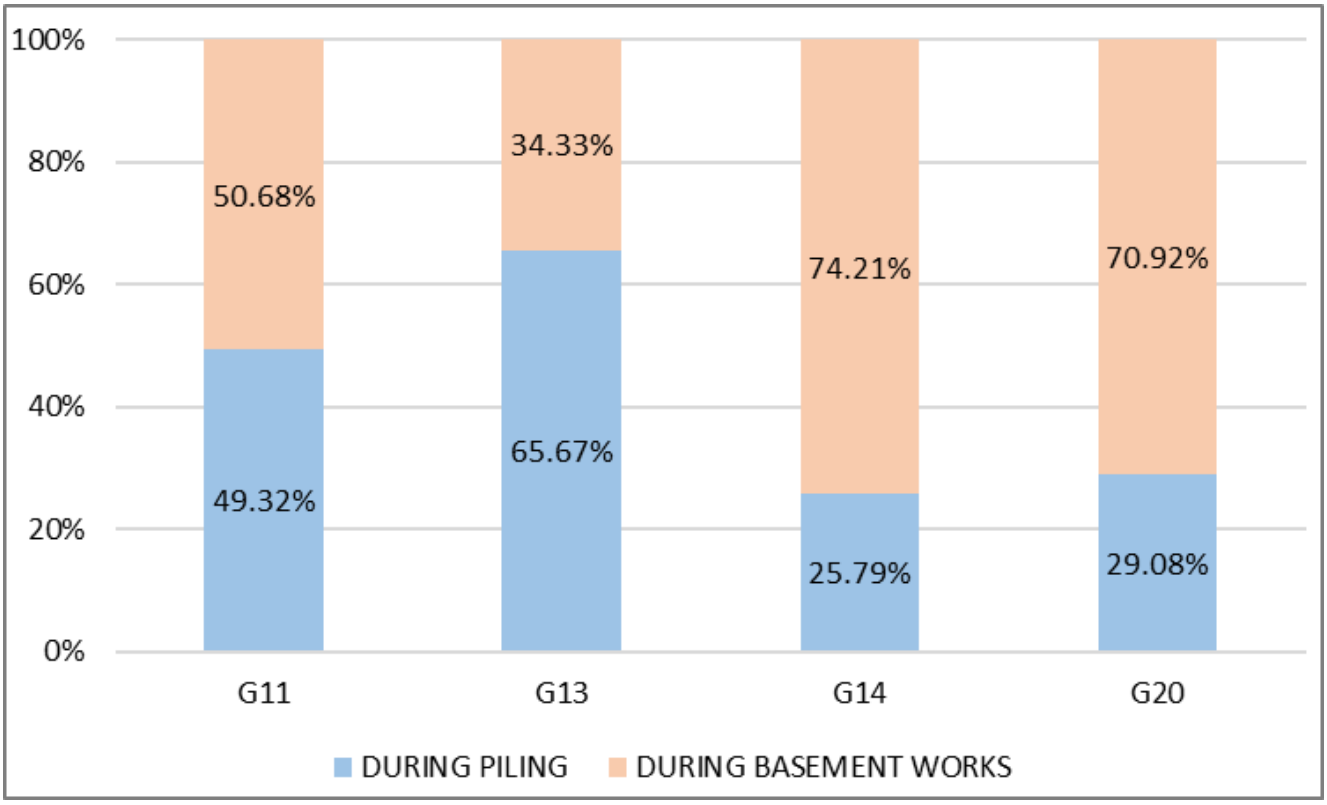


FIGURE 2C SITE B. PROPORTIONS OF GROUND SETTLEMENT DURING BORED PILE INSTALLATION AND BASEMENT EXCAVATION

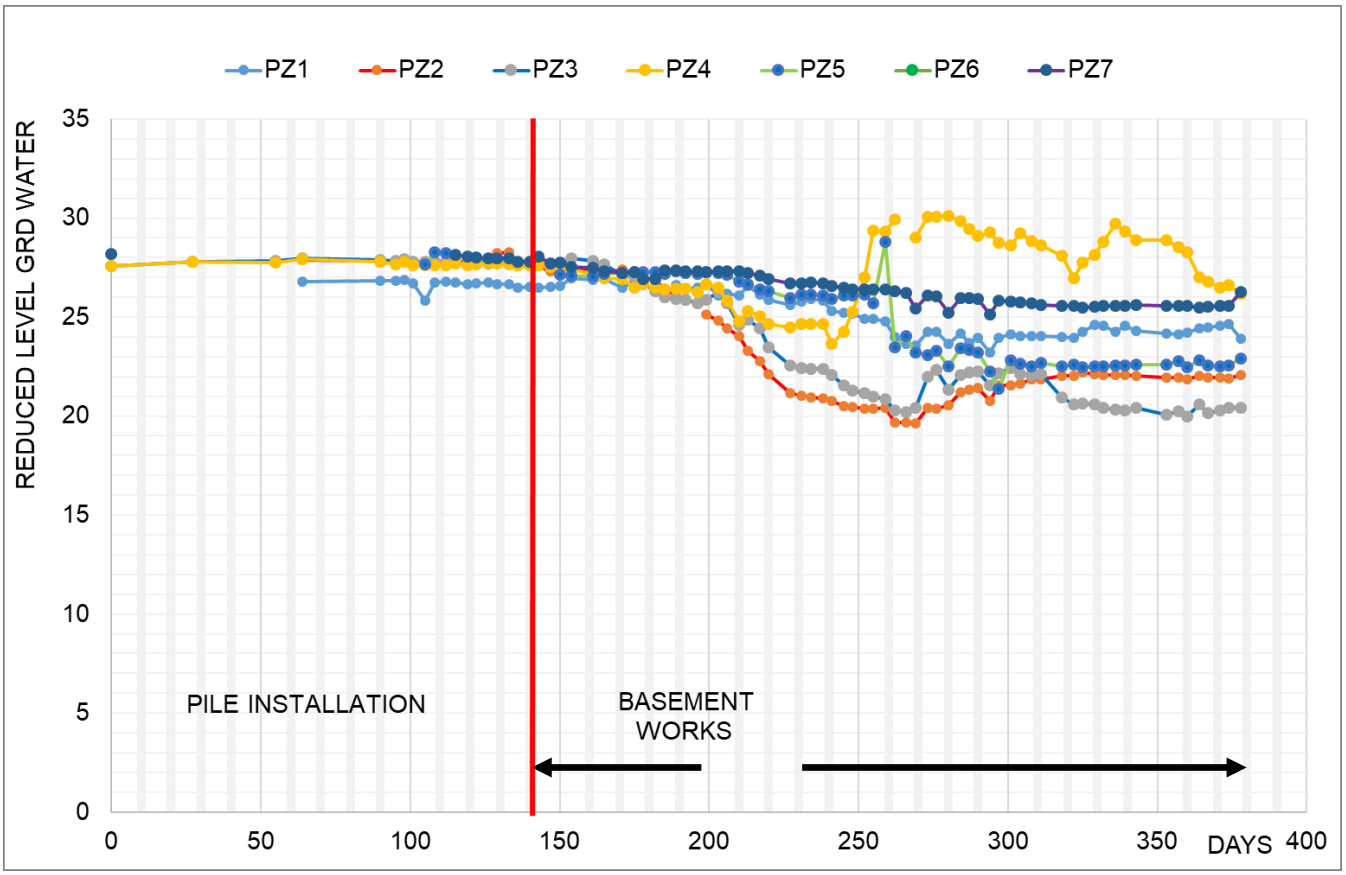


FIGURE 2D SITE B. MEASURED GROUND WATER

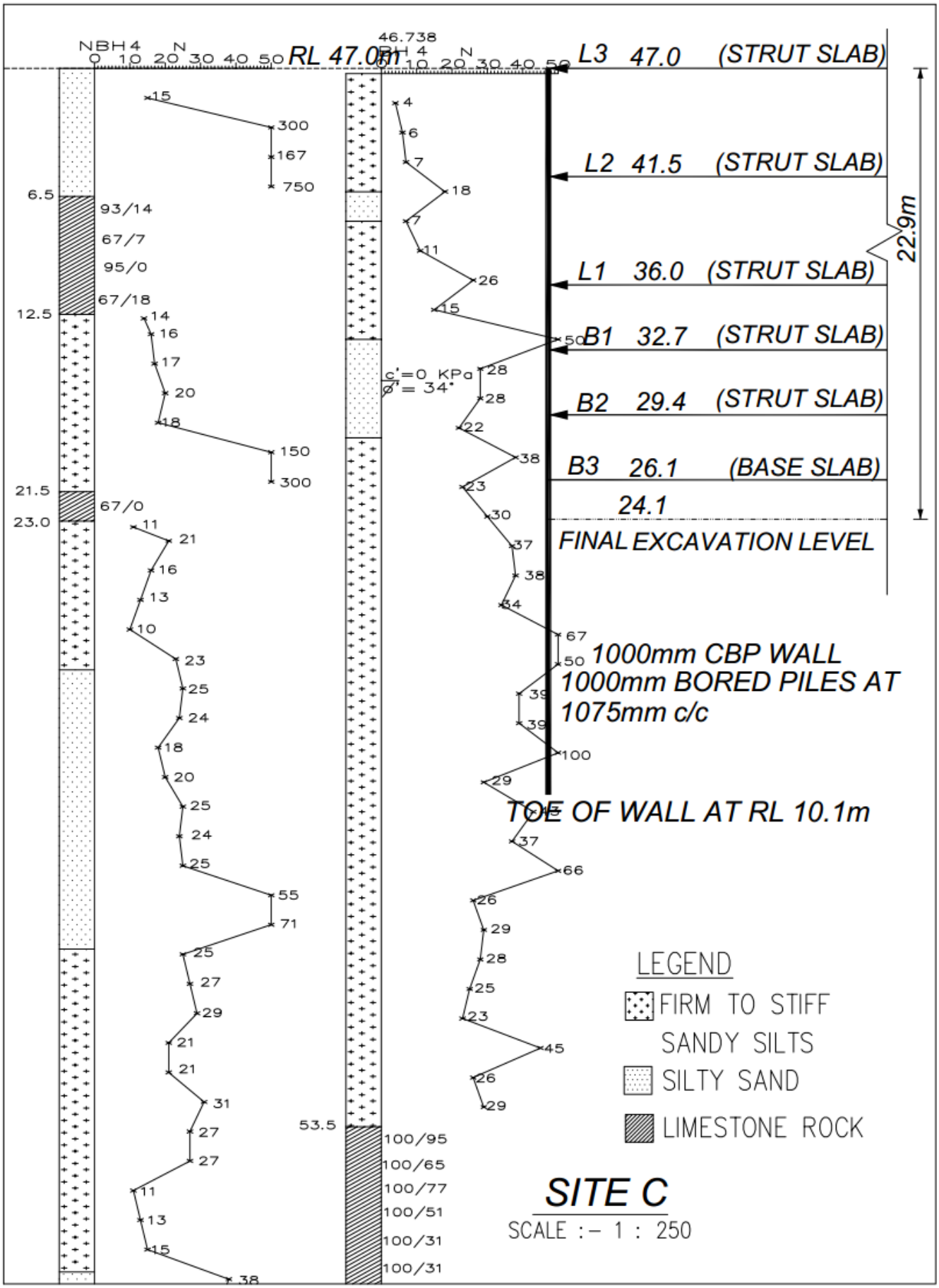


FIGURE 3A CROSS SECTION AT SITE B

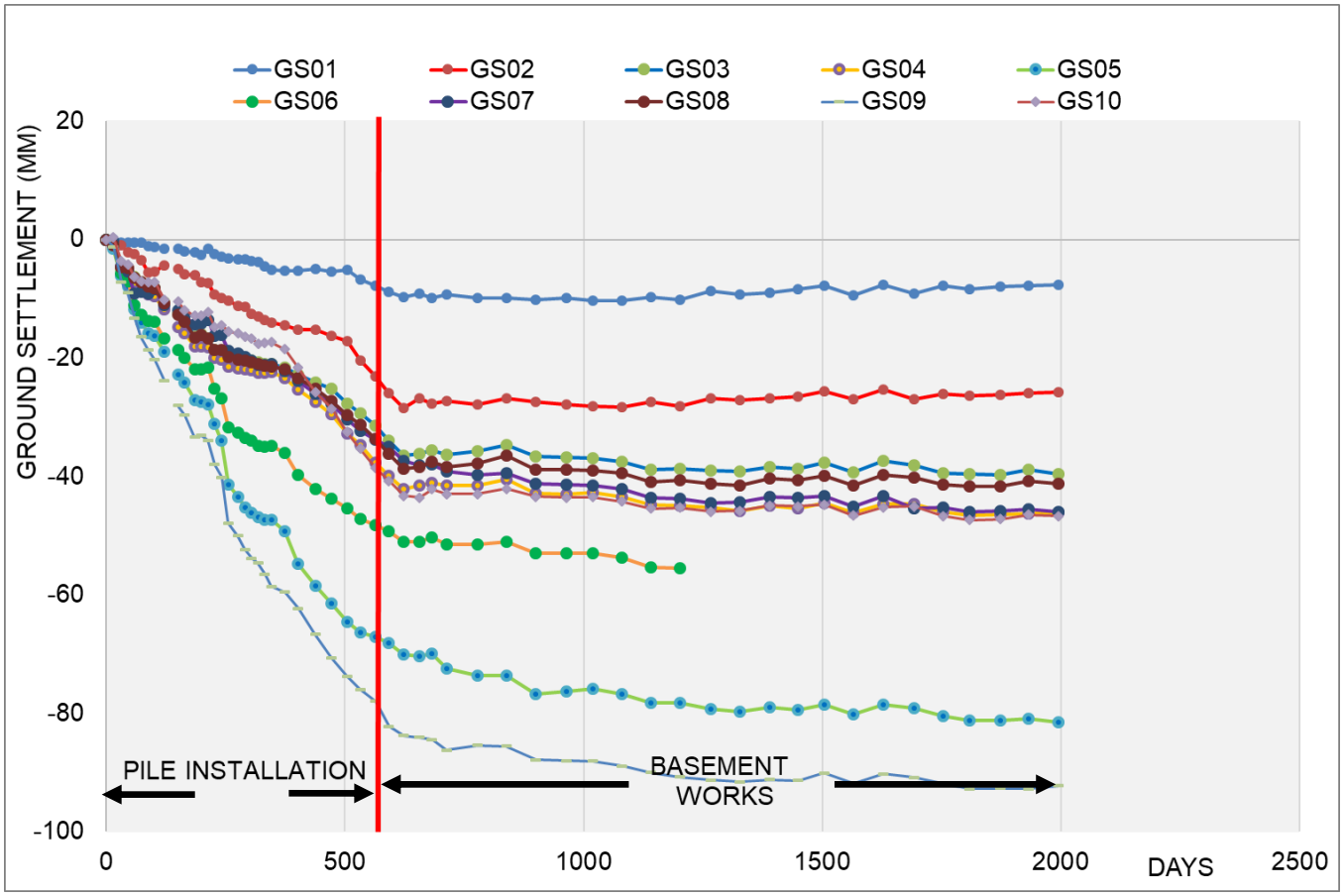


FIGURE 3B SITE C. GROUND SETTLEMENT

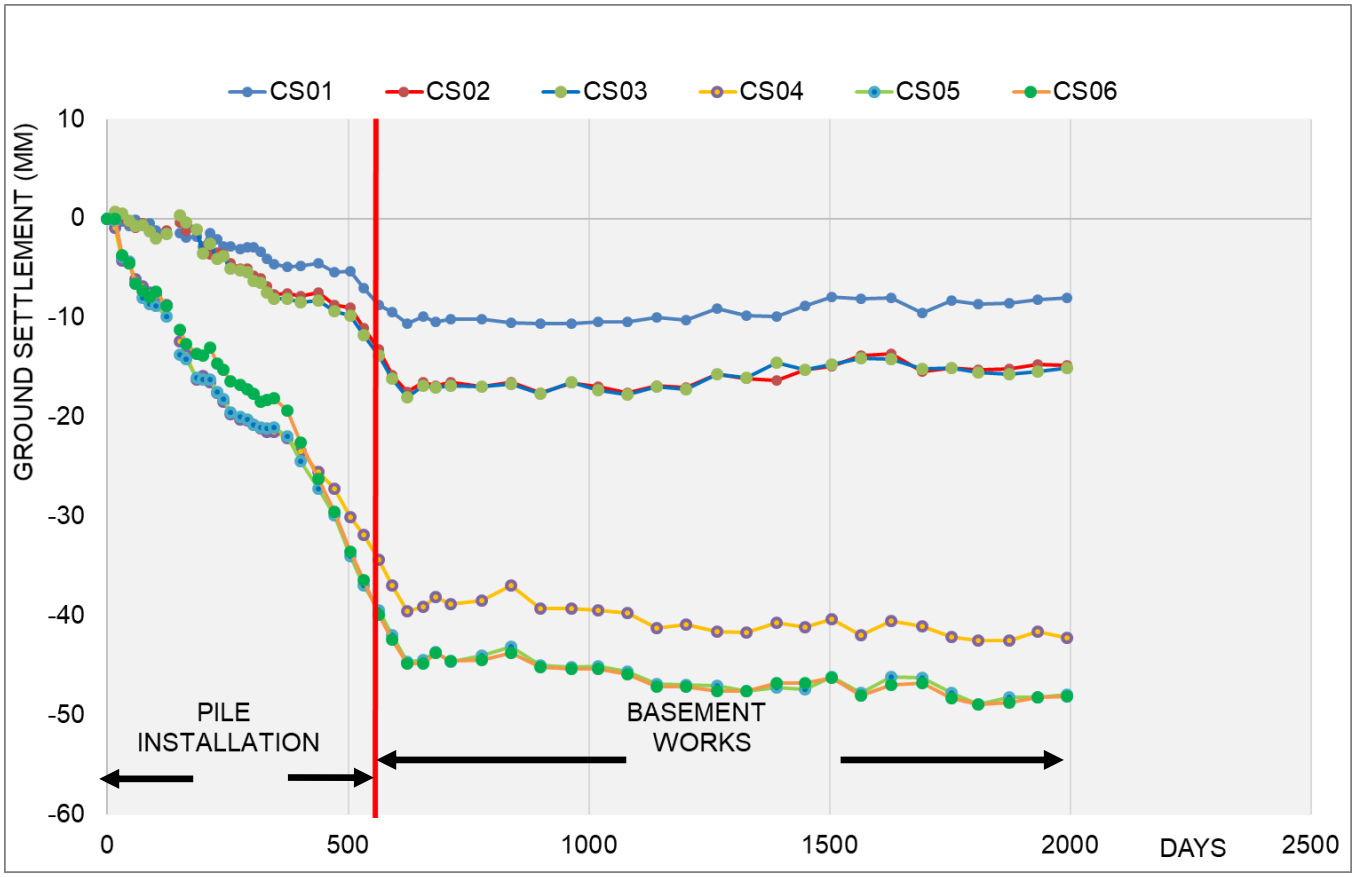


FIGURE 3C SITE C. BUILDING SETTLEMENT

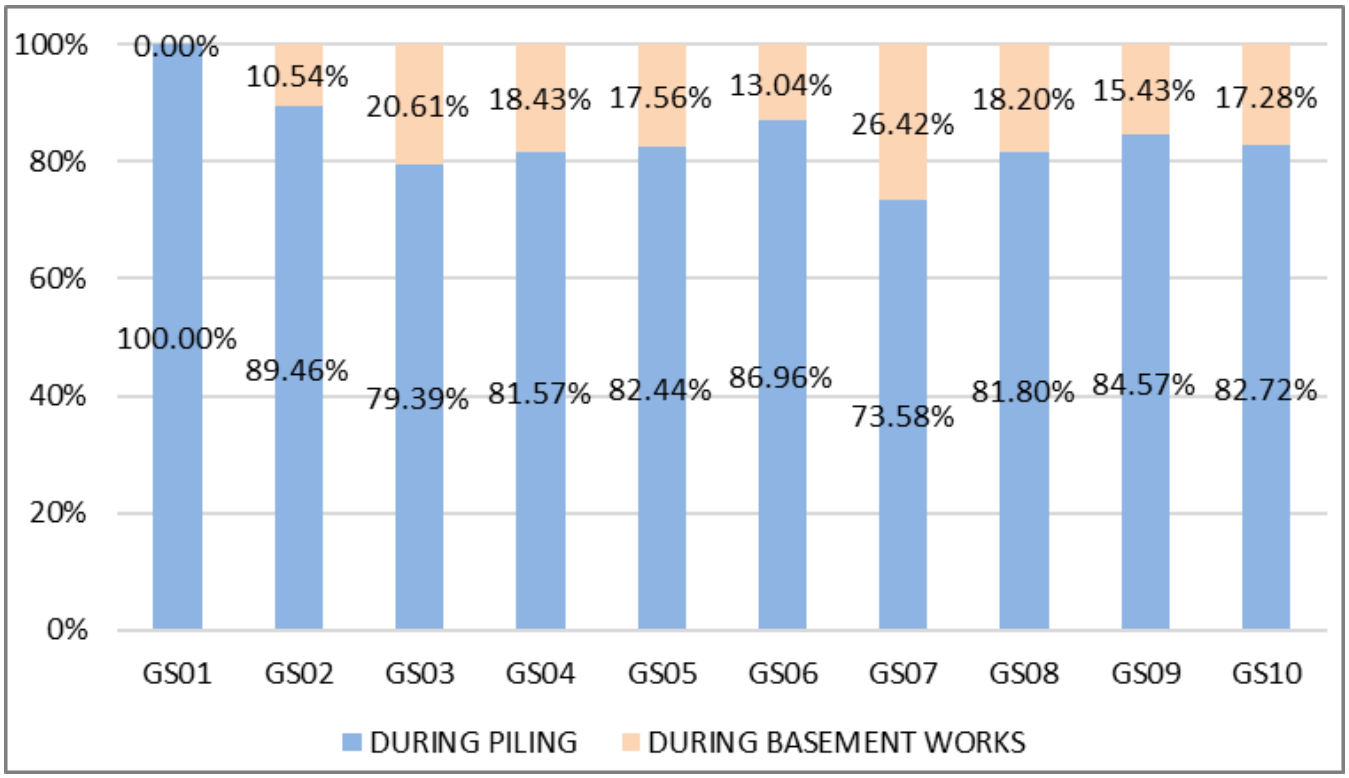


FIGURE 3D SITE C. PROPORTION OF GROUND SETTLEMENT DUE TO PILE INSTALLATION AND BASEMENT EXCAVATION

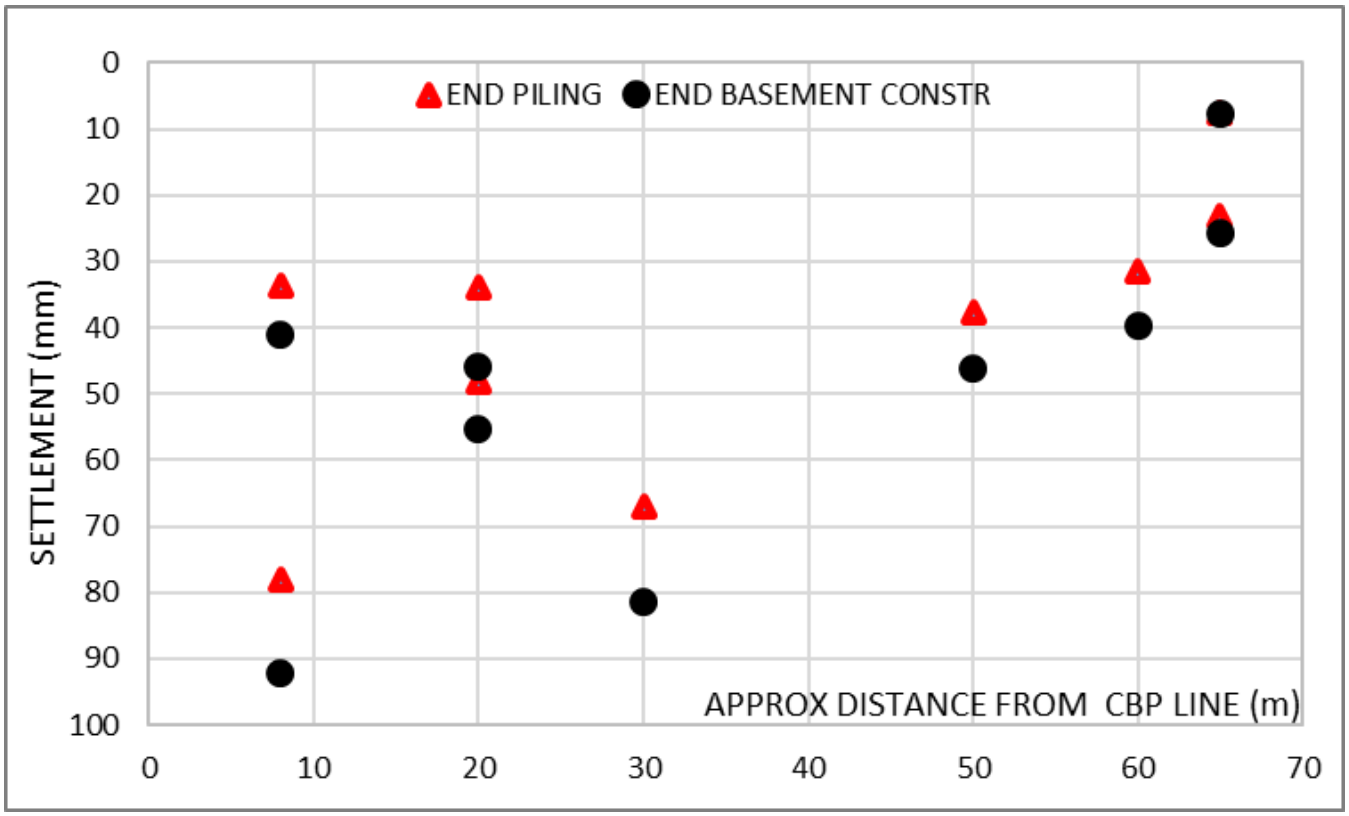


FIGURE 3E SITE C. GROUND SETTLEMENT VERSUS DISTANCE

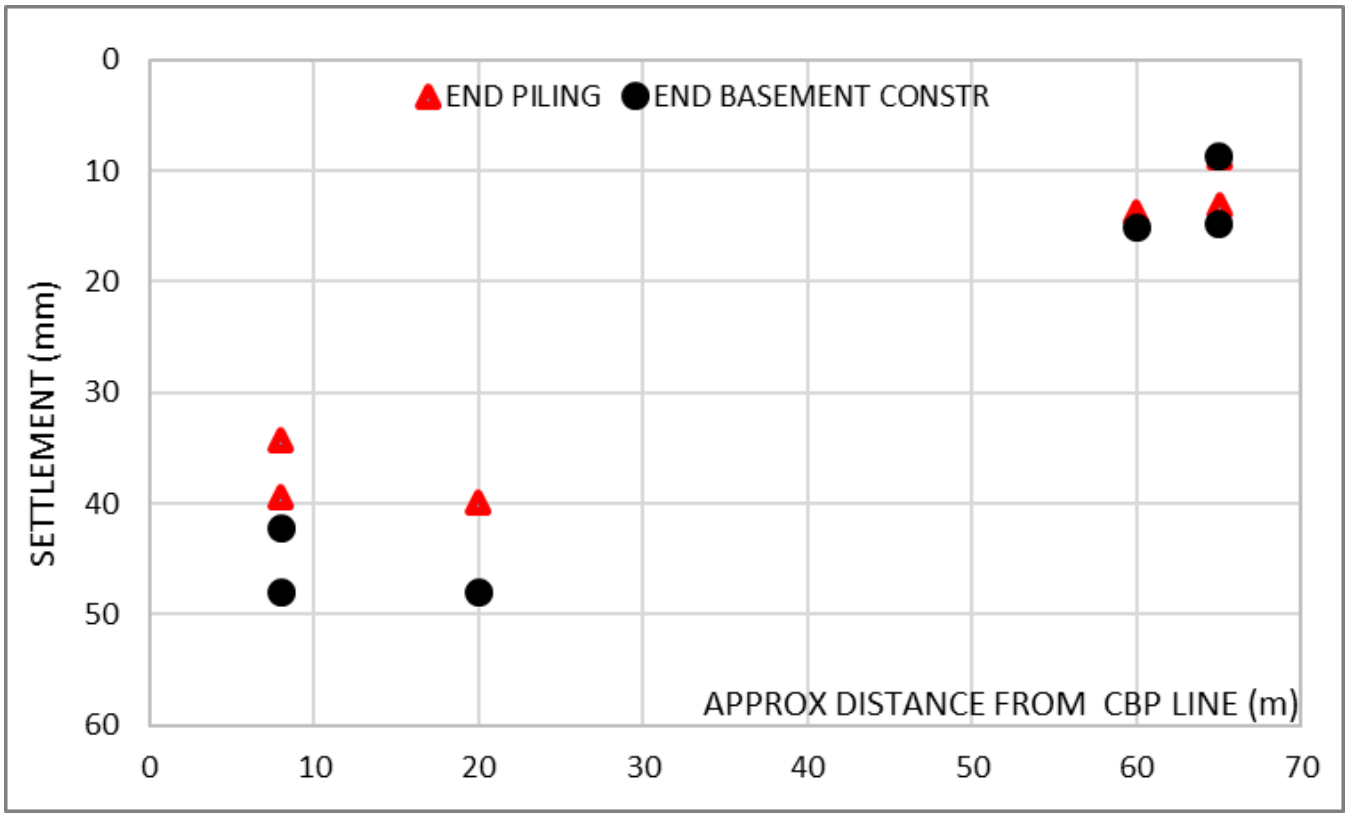


FIGURE 3F SITE C. COLUMN SETTLEMENT VERSUS DISTANCE

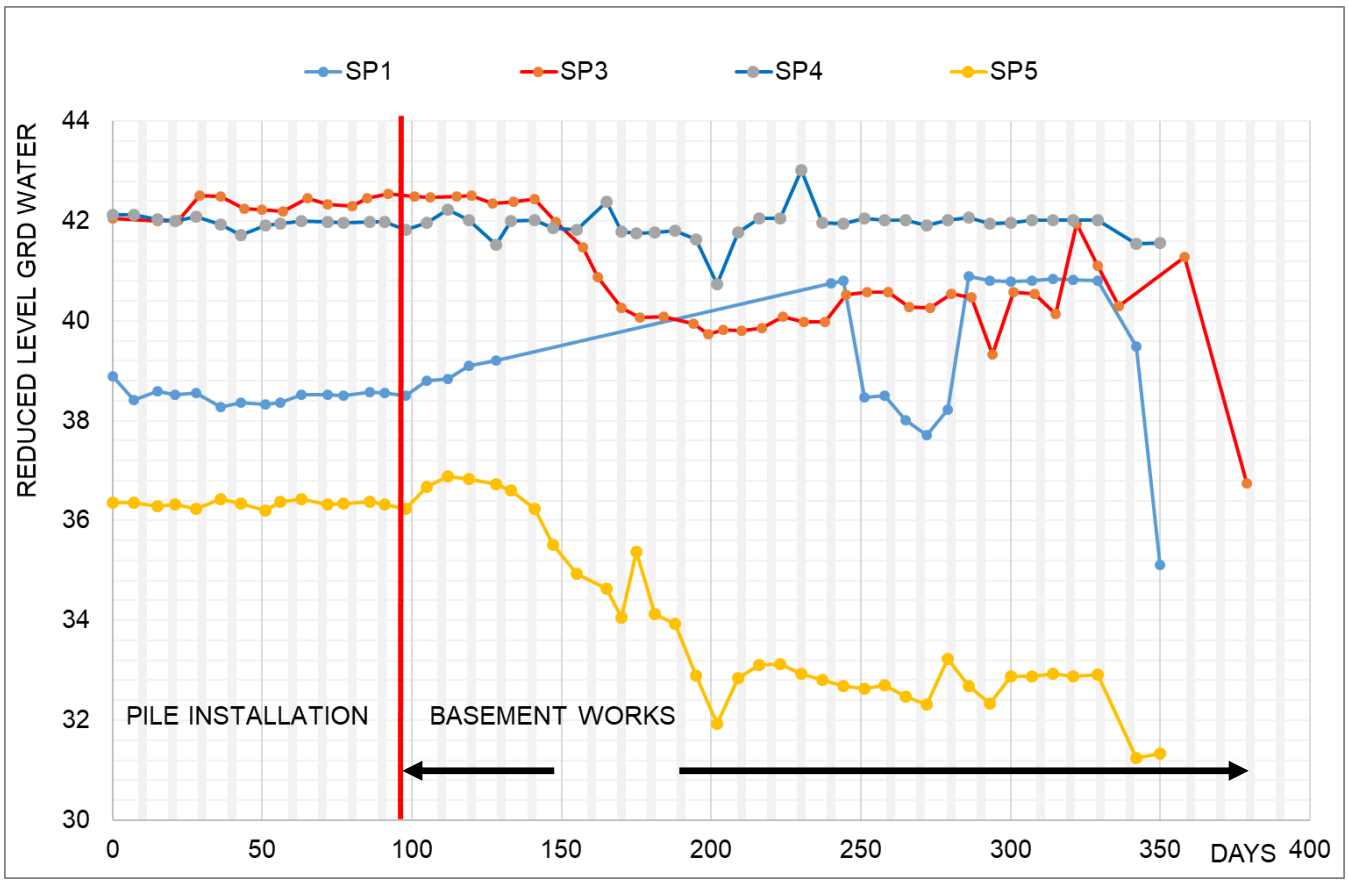


FIGURE 3G SITE C. MEASURED GROUND WATER TABLE

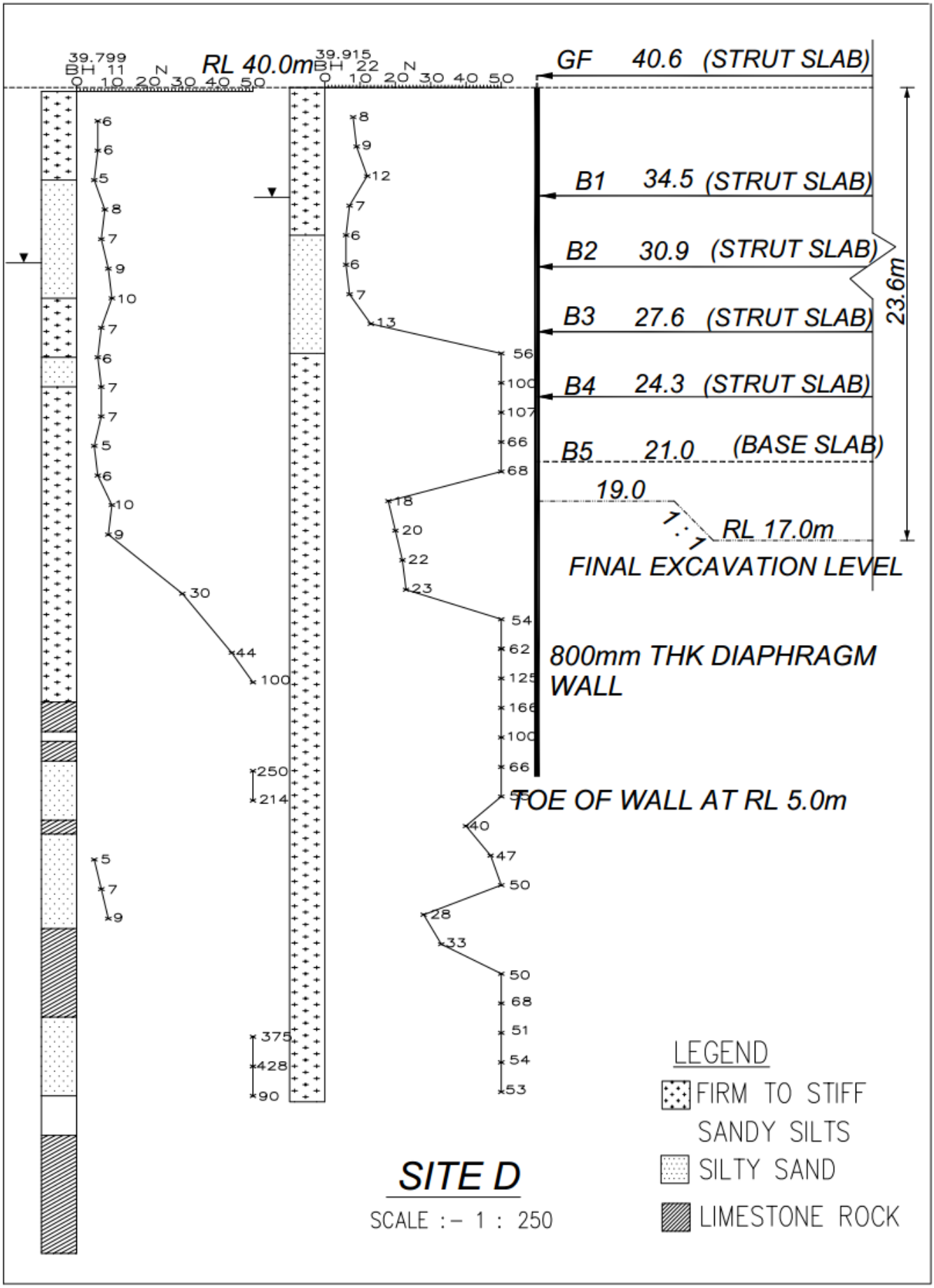


FIGURE 4A SITE D. CROSS SECTION

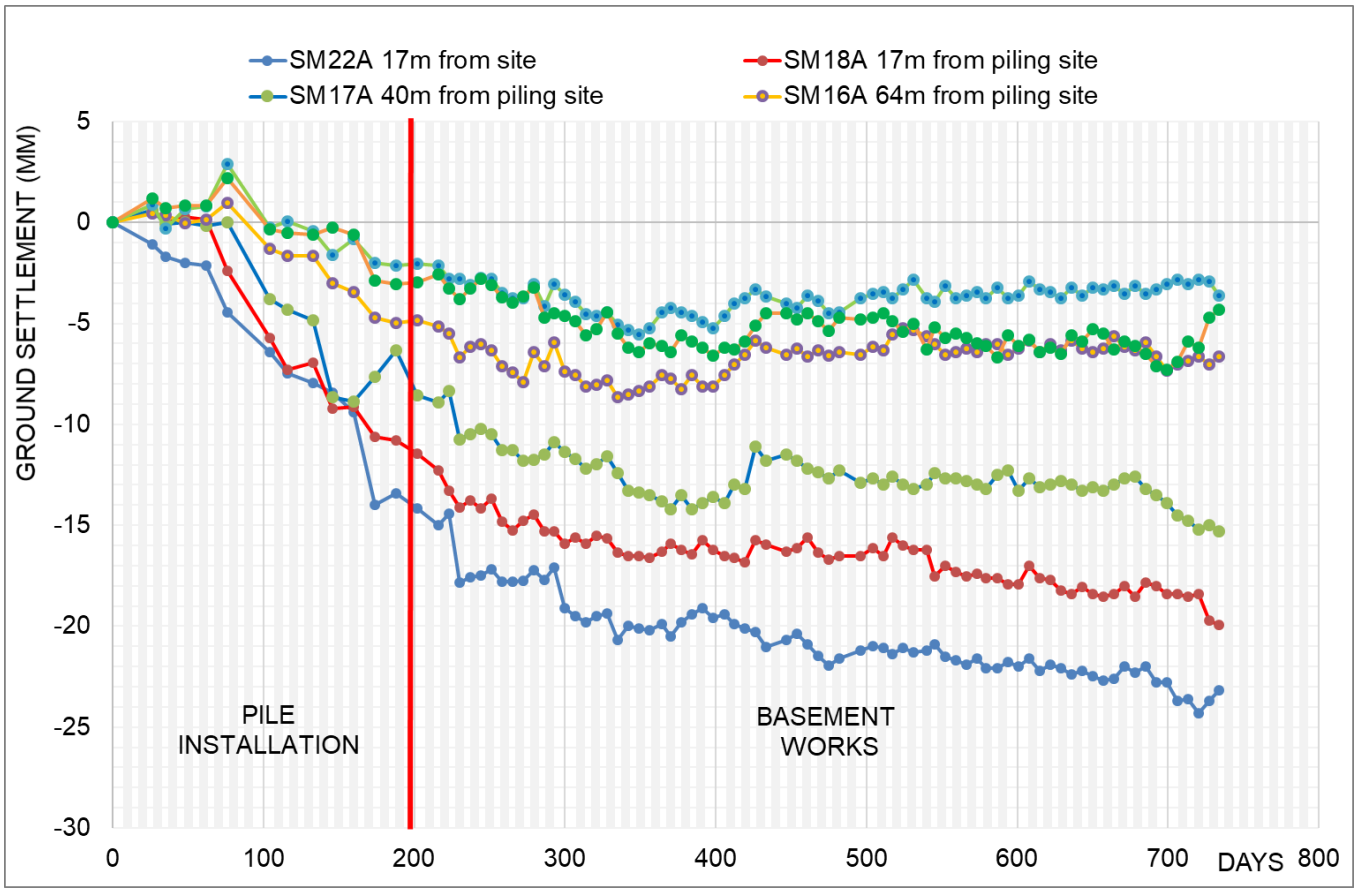


FIGURE 4B SITE D. SETTLEMENT OF ADJACENT BUILDING ON SHALLOW FOUNDATIONS

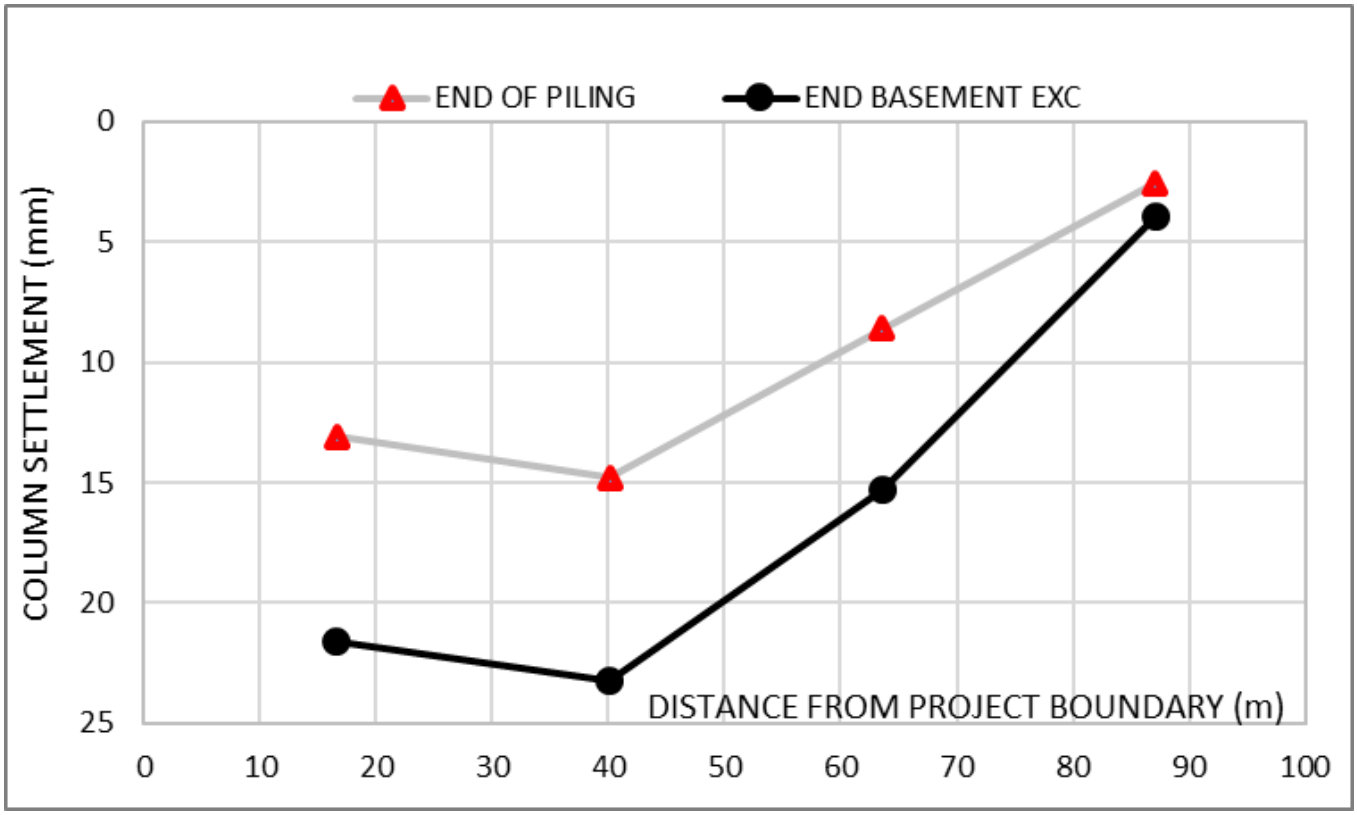


FIGURE 4C SITE D. SETTLEMENT WITH DISTANCE

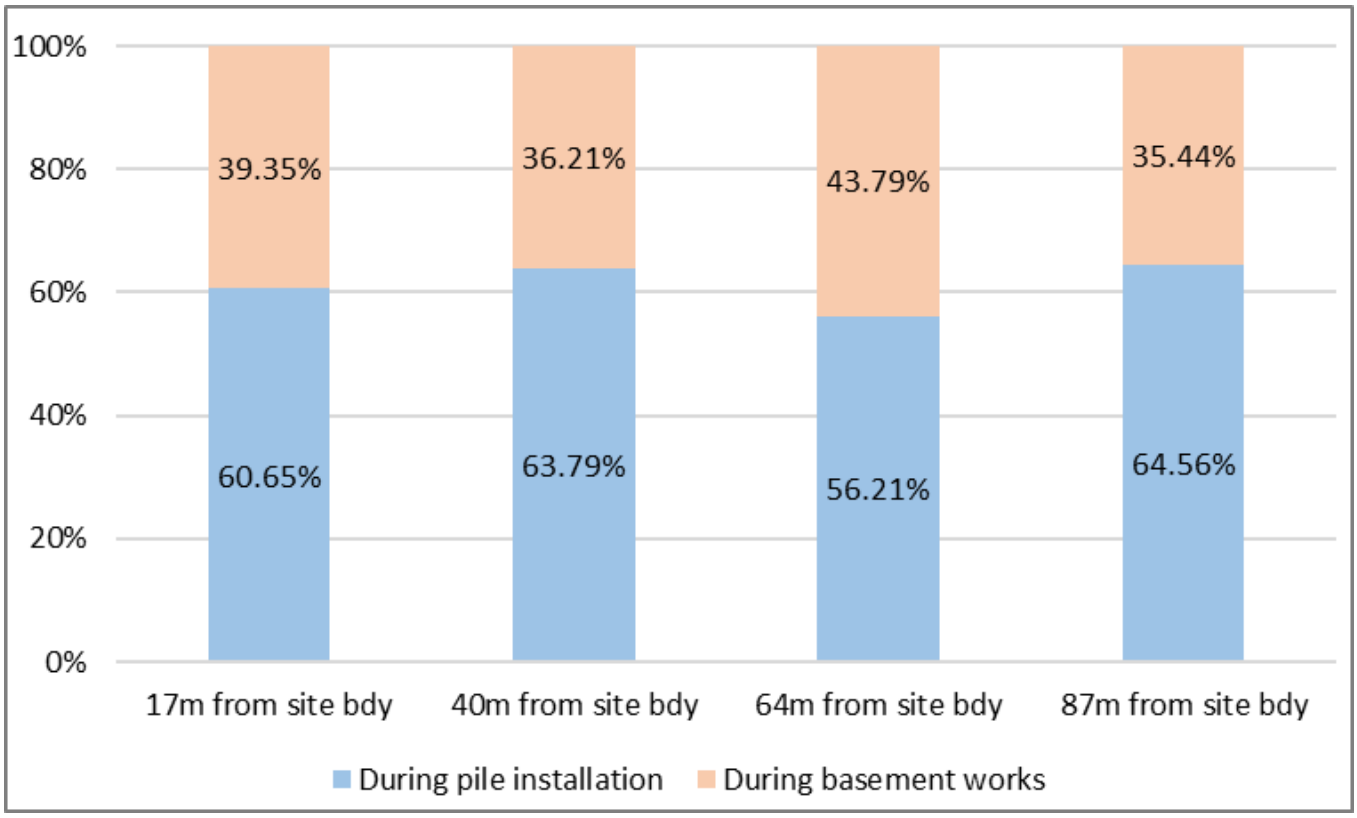


FIGURE 4D SITE D. PROPORTION OF SETTLEMENT DURING PILE INSTALLATION AND BASEMENT EXCAVATION

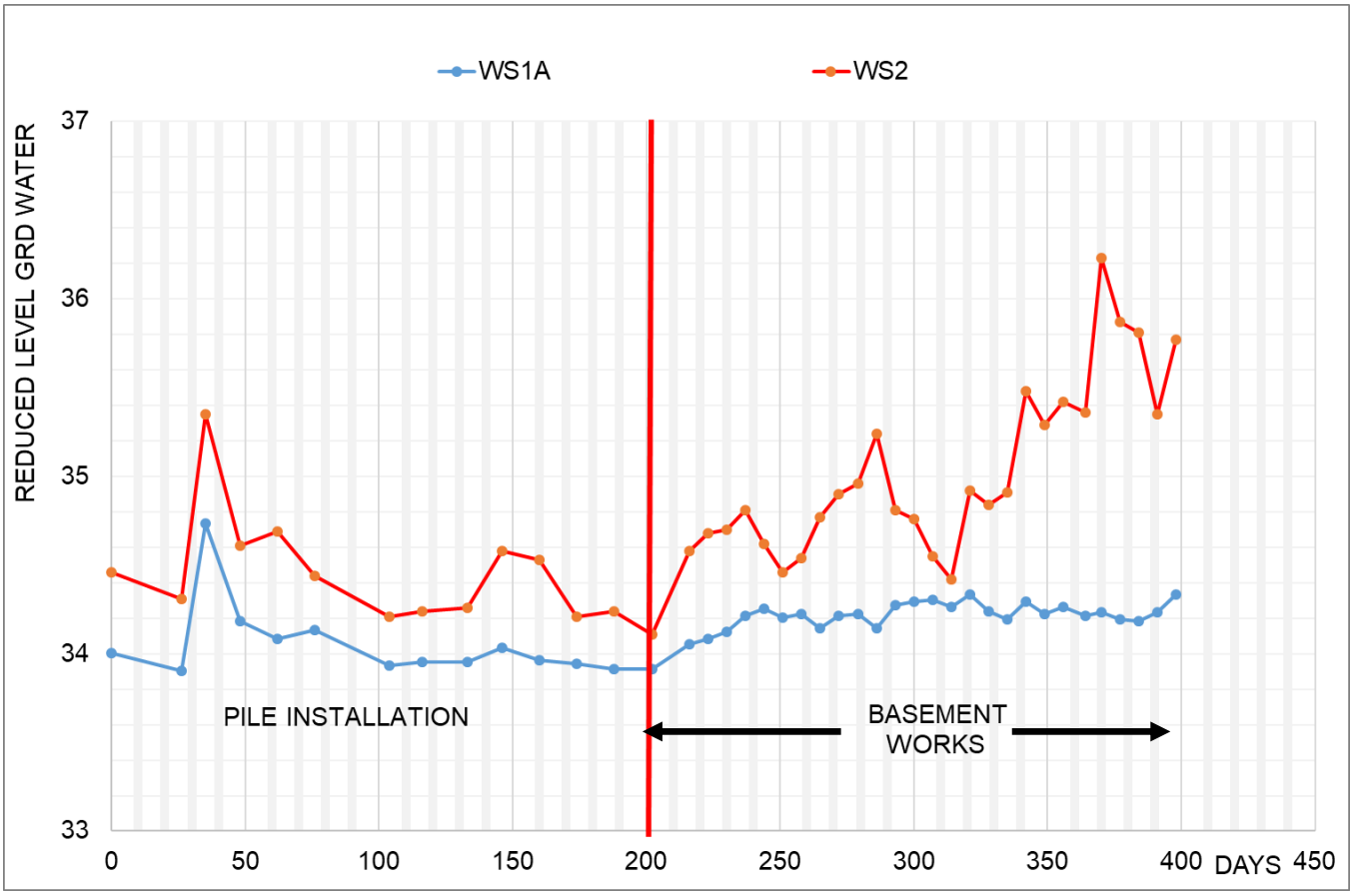


FIGURE 4E SITE D. MEASURED GROUND WATER TABLE

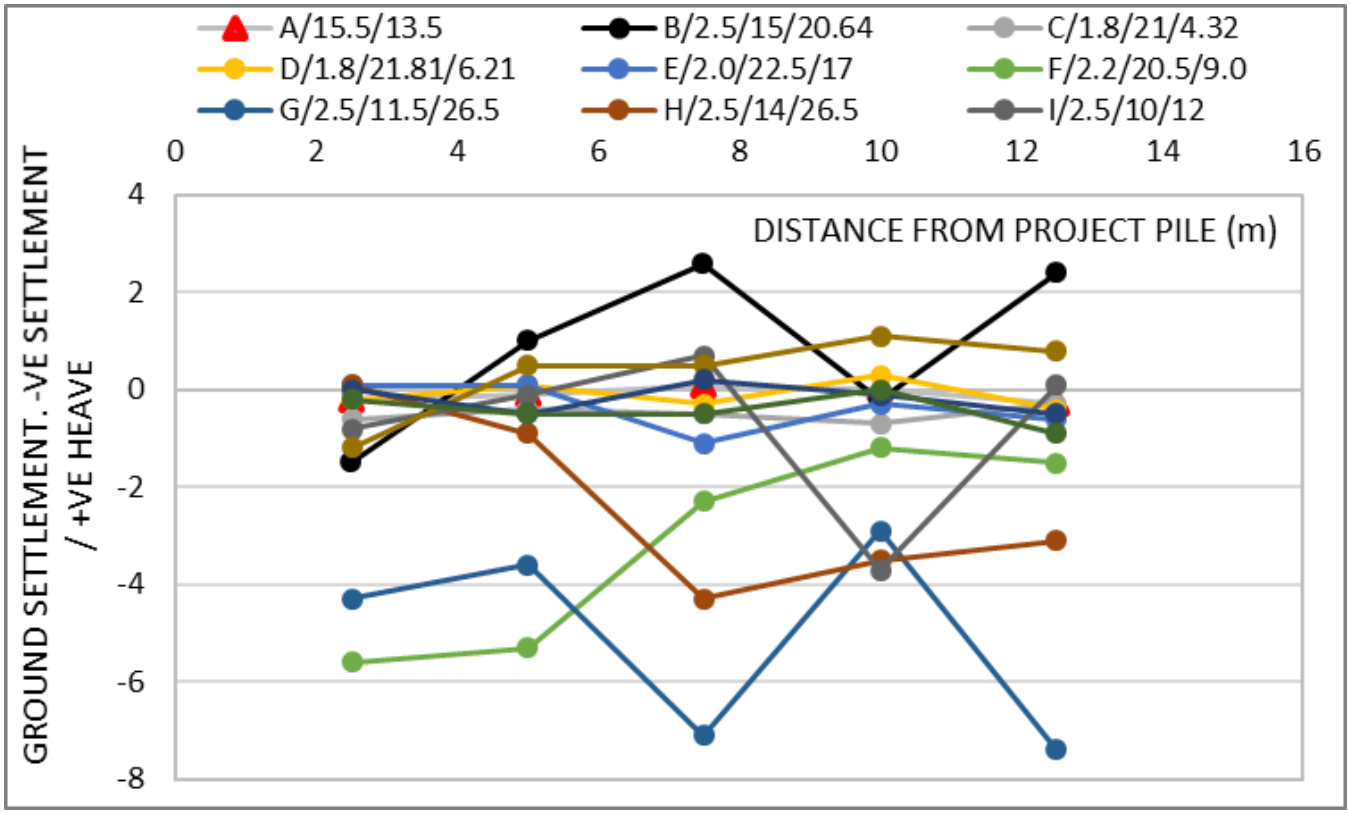


FIGURE 5. SITE E. GROUND SETTLEMENT DURING BORED PILE INSTALLATION

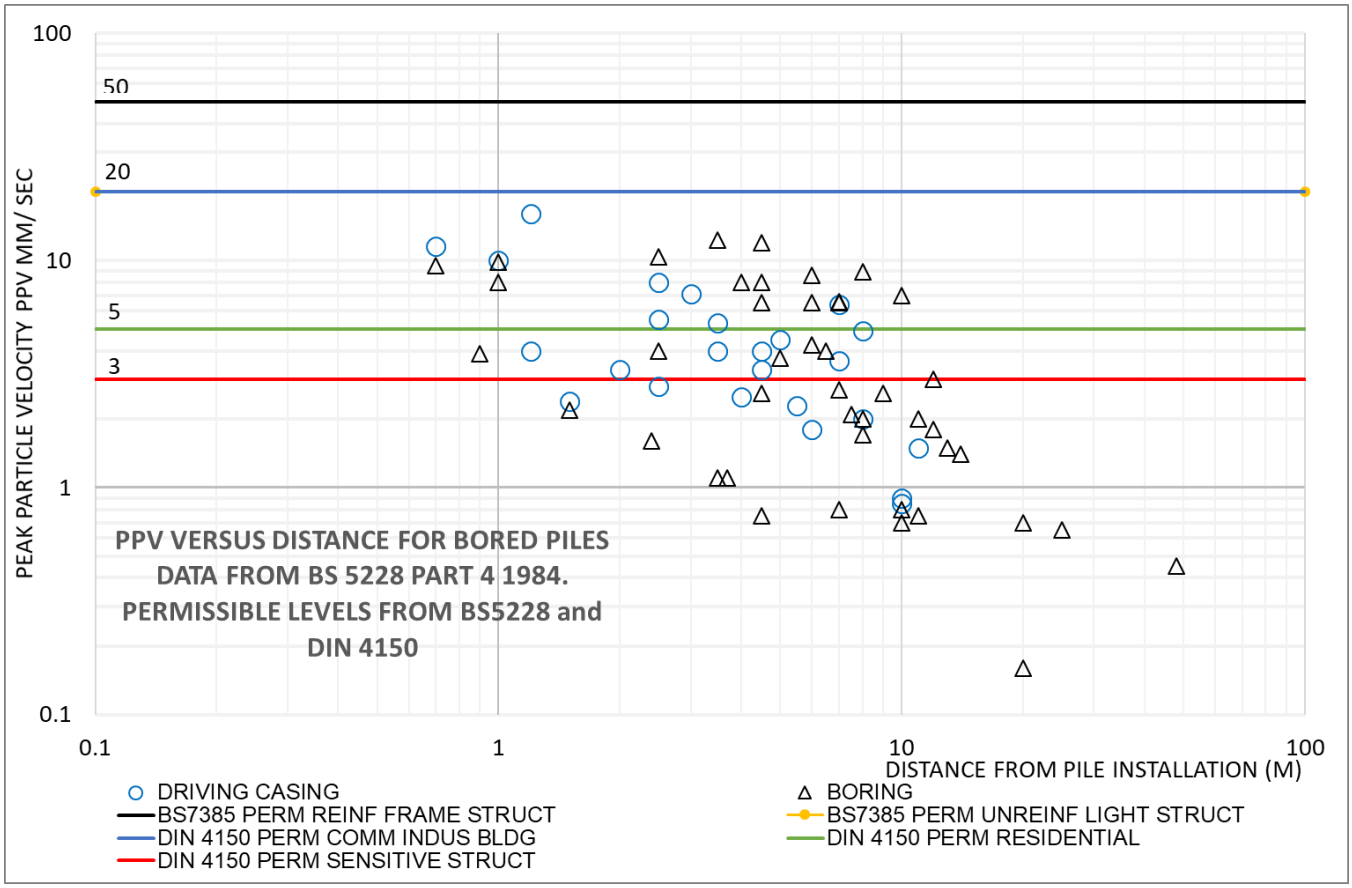


FIGURE 6 PPV VERSUS DISTANCE FROM BORED PILES FROM BS 5228 PART 4 1984

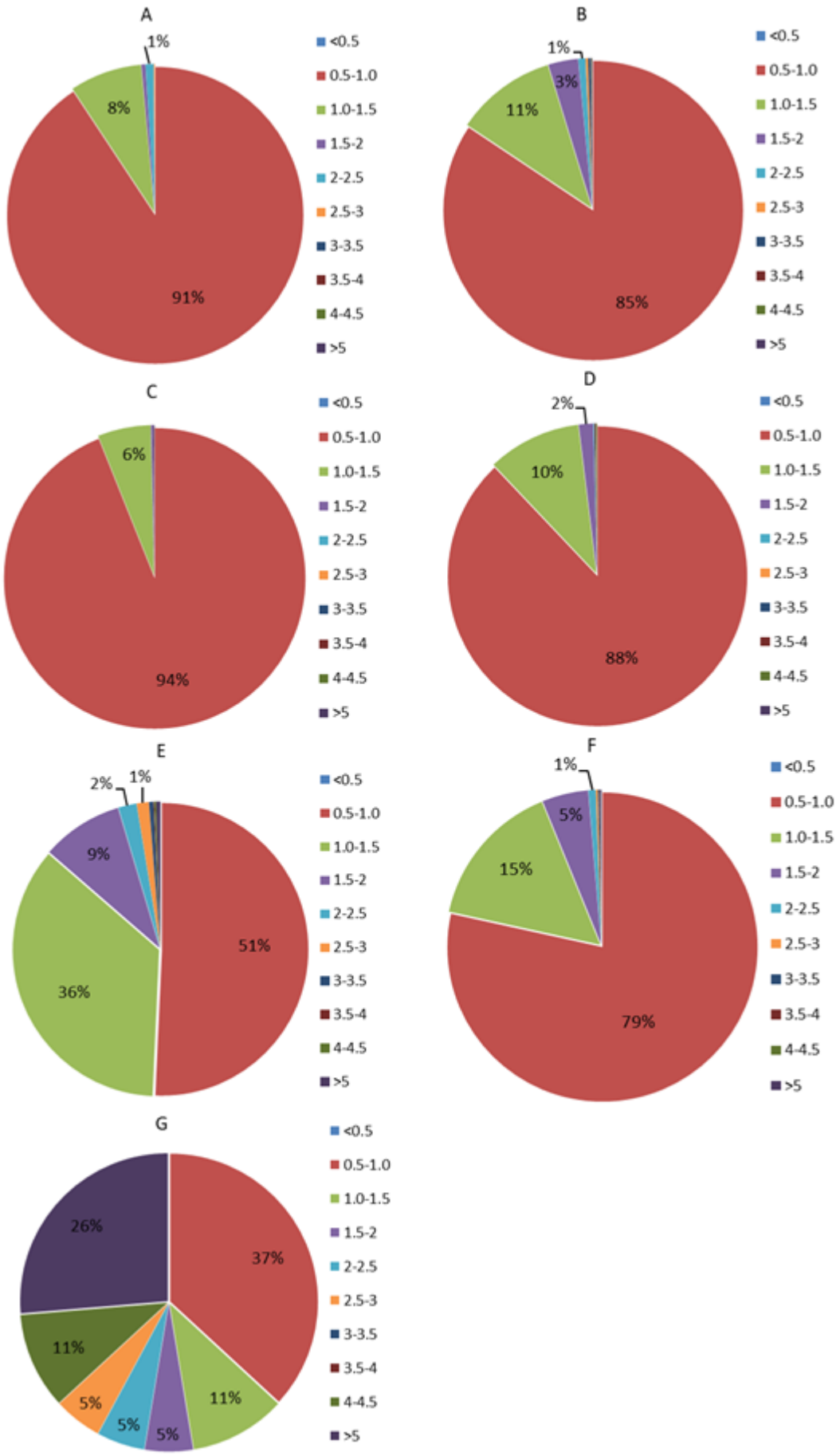


FIGURE 7 DISTRIBUTION OF PPV (M/S) MEASURED AT SITE E DURING INSTALLATION OF BORED PILES

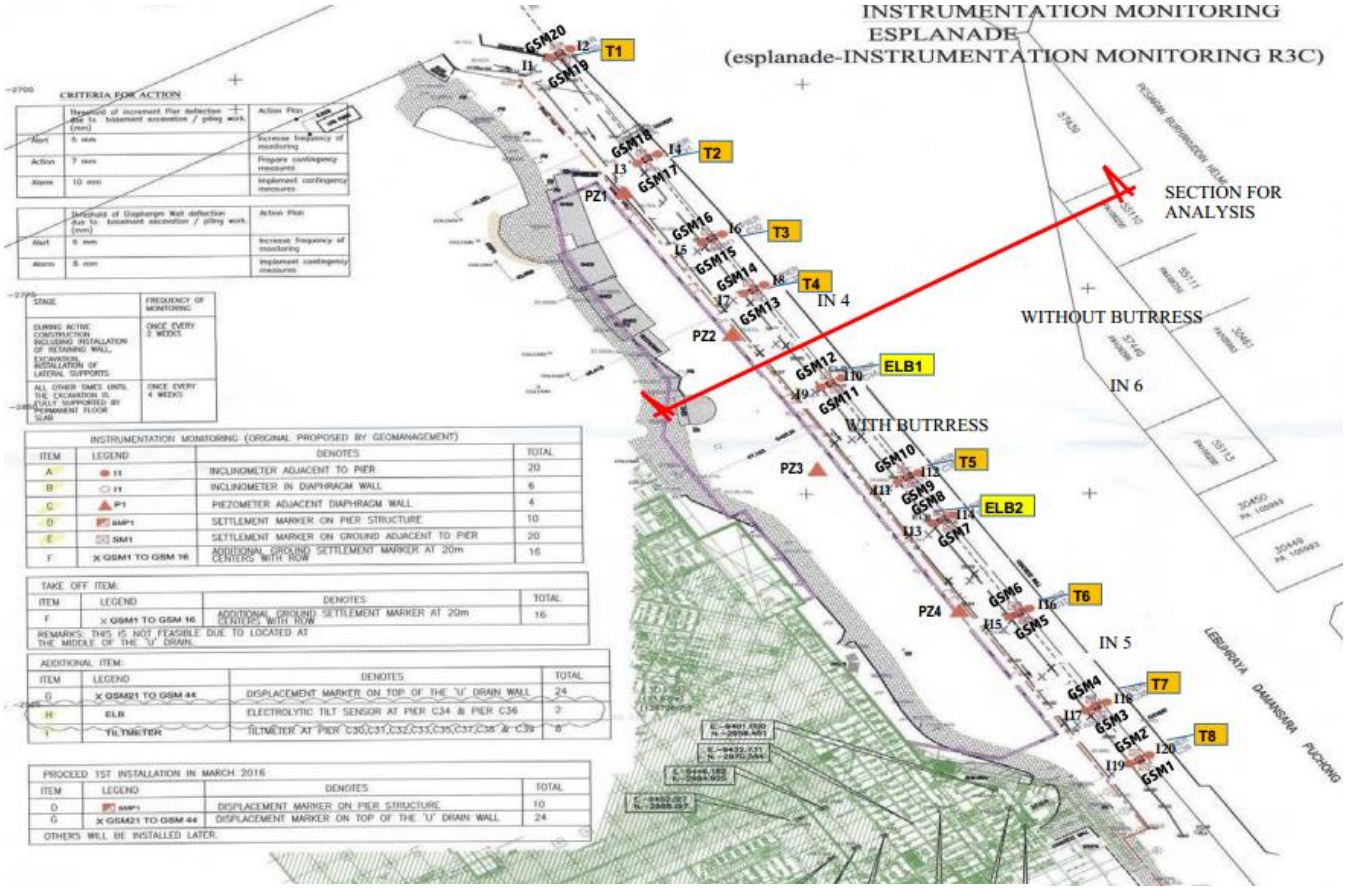


FIGURE 8A SITE A. INSTRUMENTATION LAYOUT PLAN

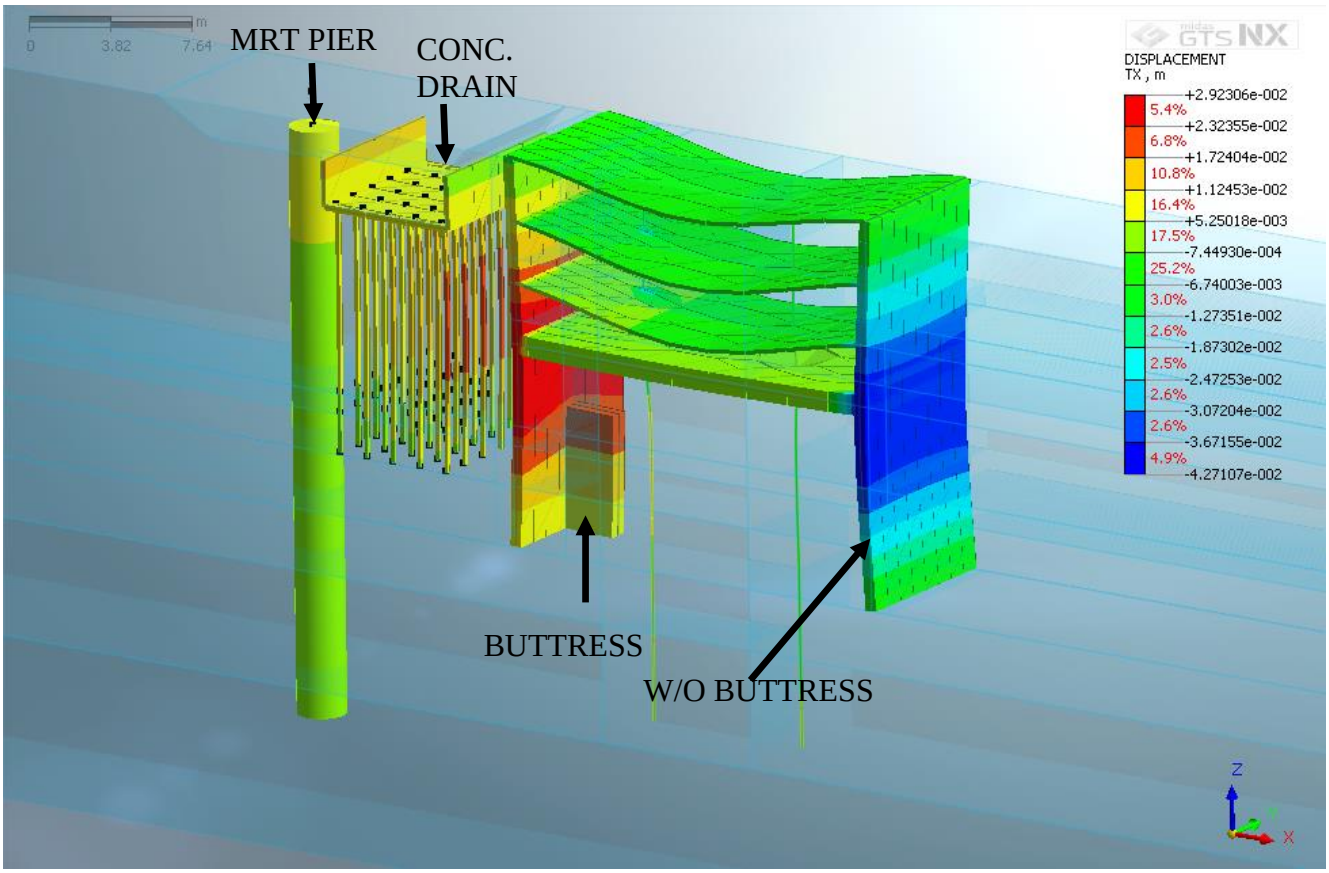
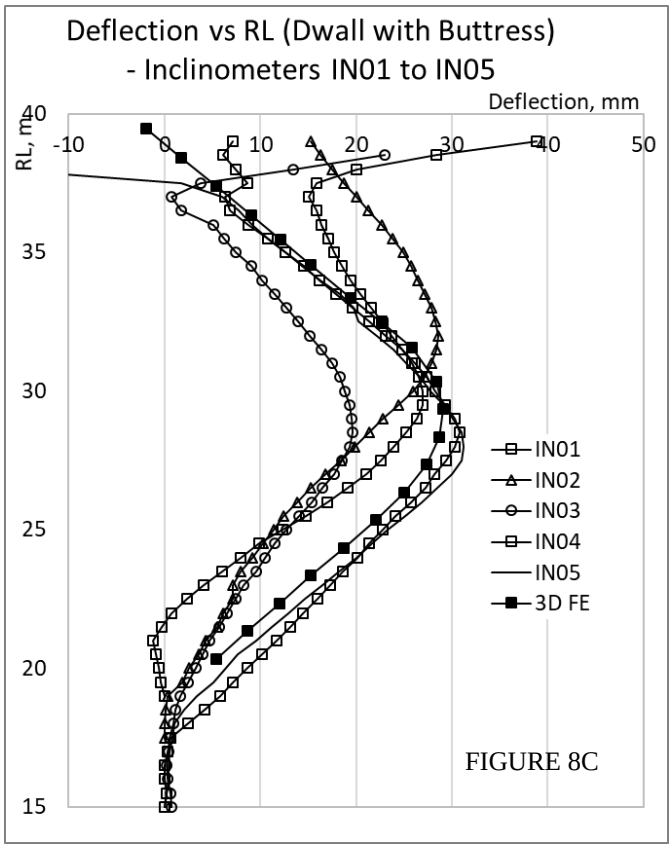
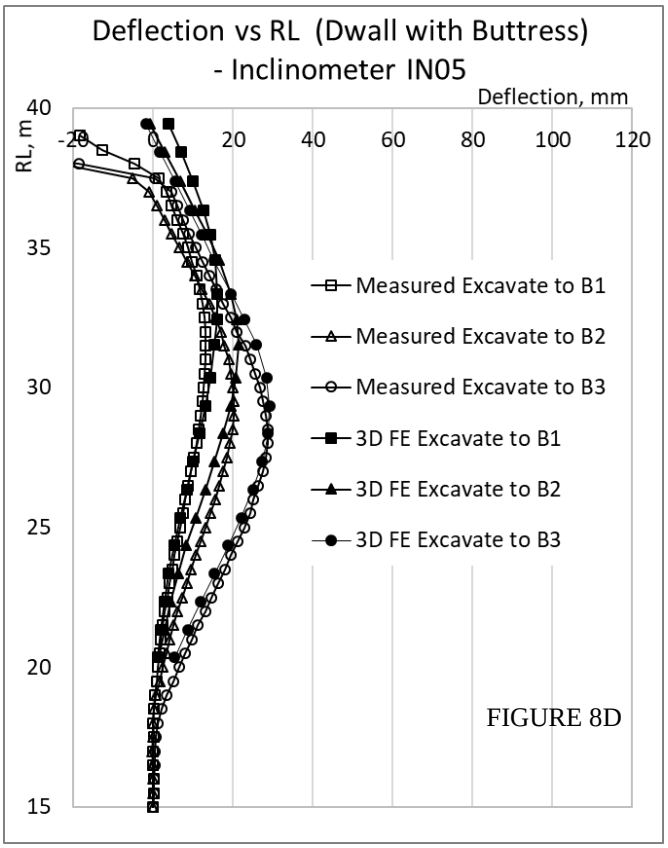
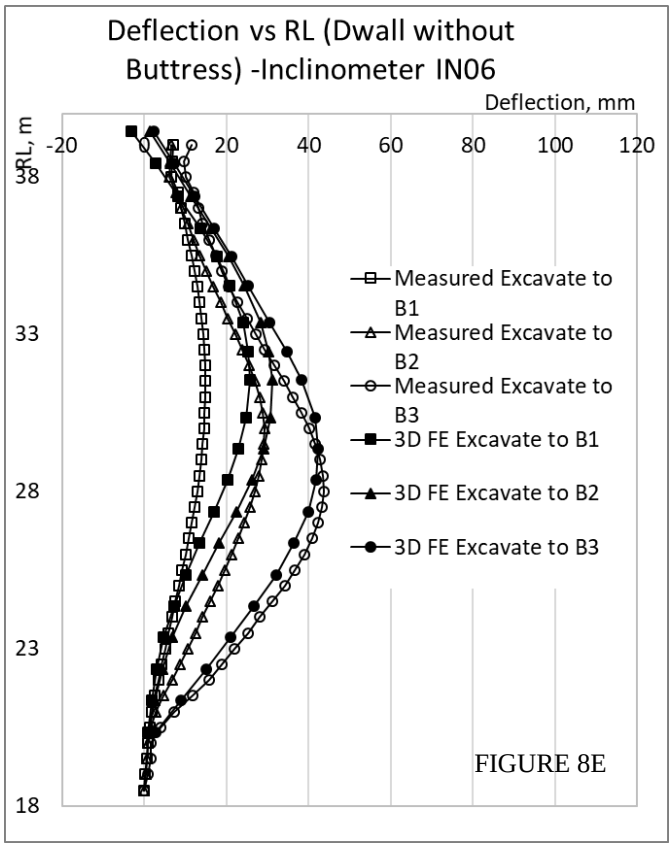


FIGURE 8B SITE A. DEFORMED MESH AFTER COMPLETION OF BASEMENT EXCAVATION







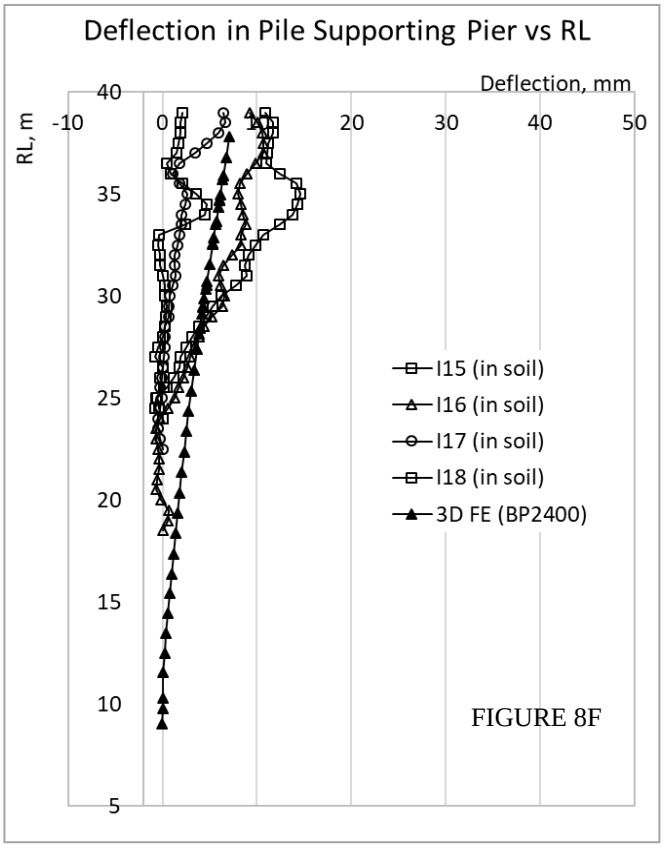


FIGURE 8C TO 8F SITE A. COMPARISON OF MEASURED AND COMPUTED DEFLECTION

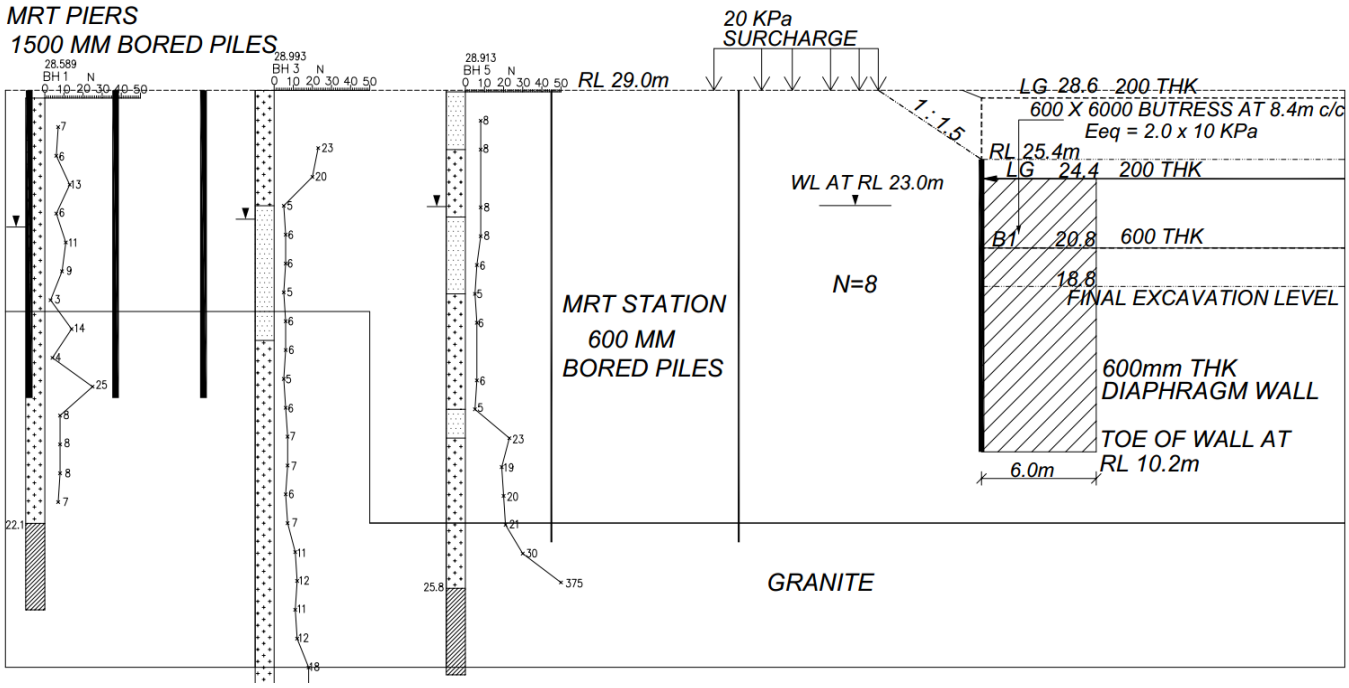


FIGURE 9A SITE G. CROSS SECTION

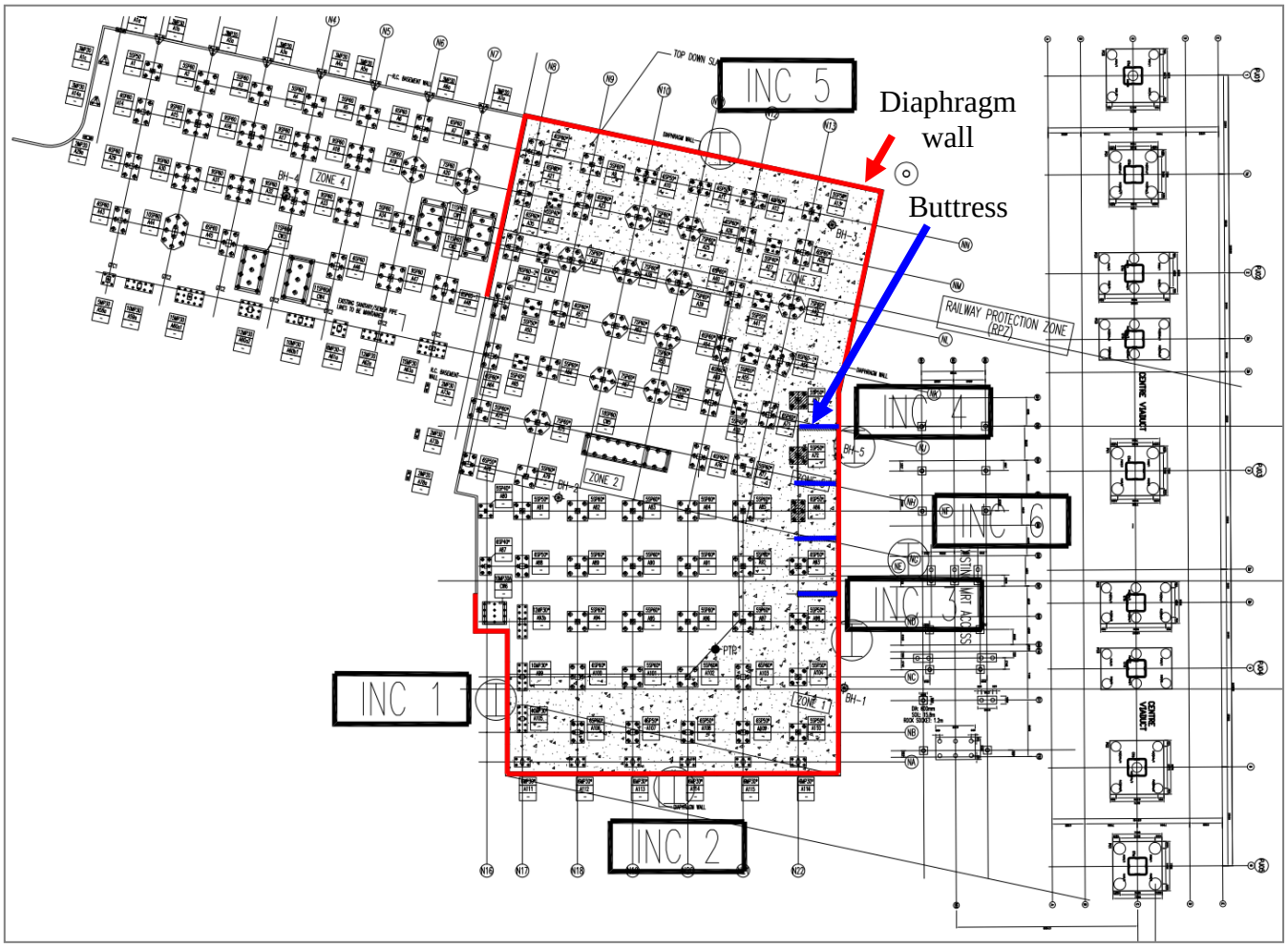


FIGURE 9B SITE G. LAYOUT OF INCLINOMETERS

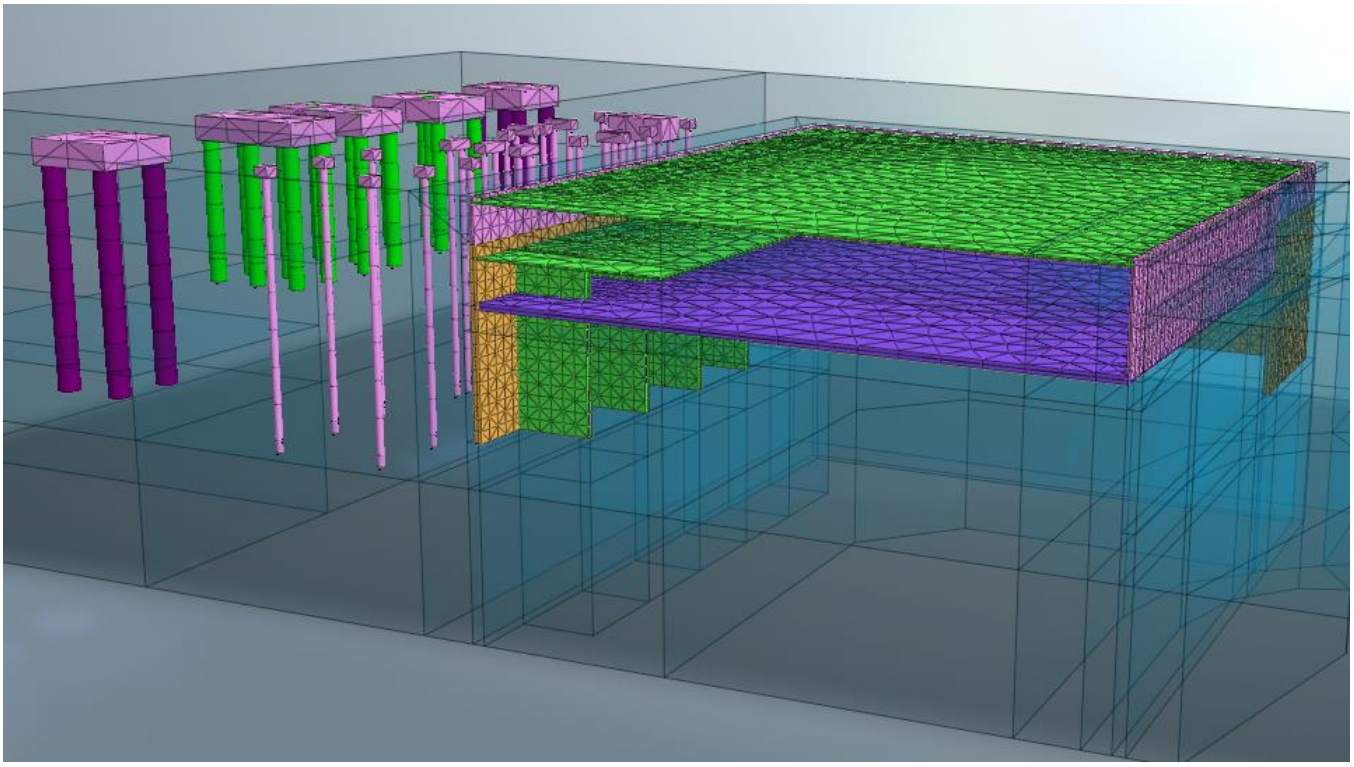
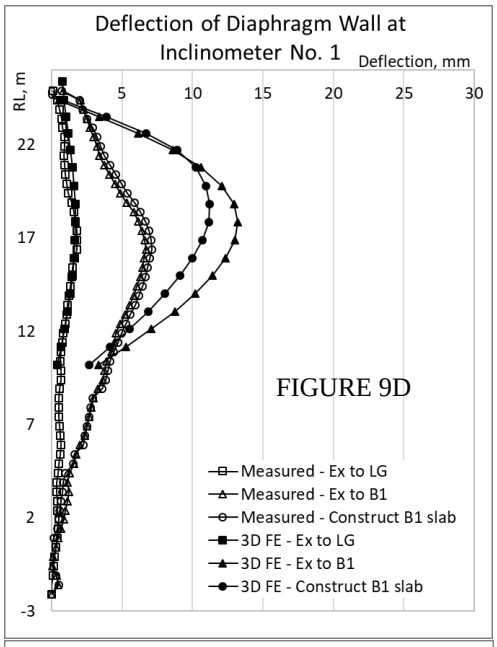
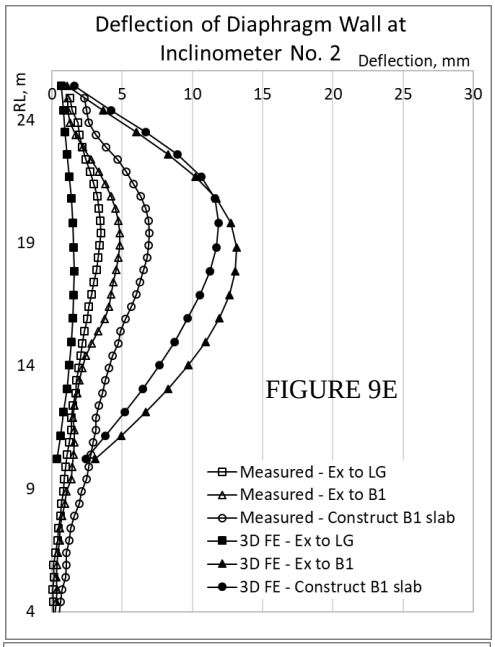
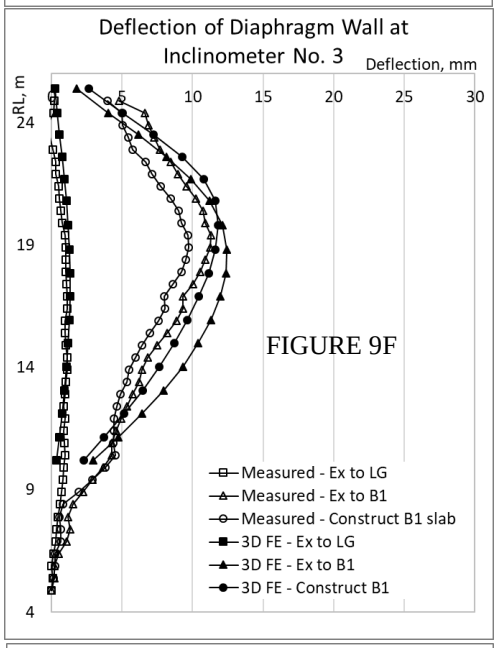
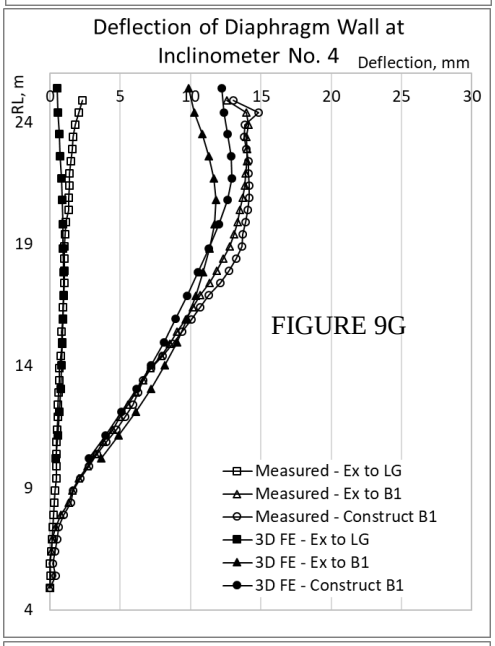


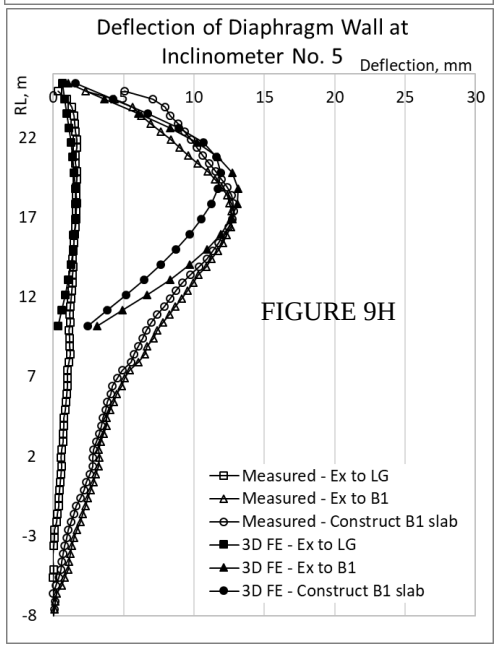
FIGURE 9C SITE G. FINITE ELEMENT MODEL











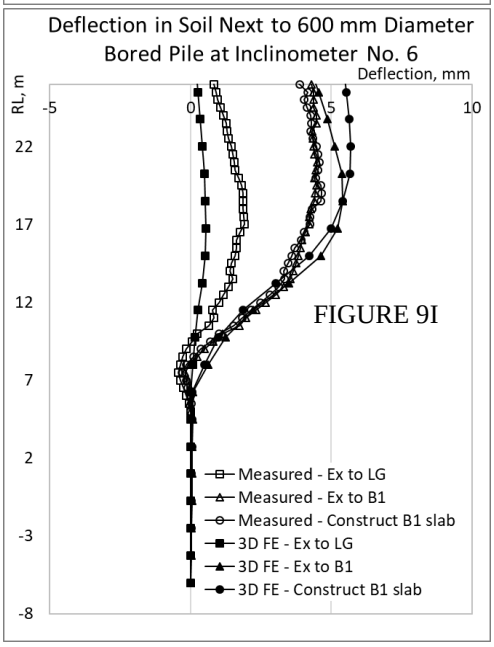


FIGURE 9D TO 9I. SITE G. COMPARISON OF MEASURED AND COMPUTED DEFLECTION

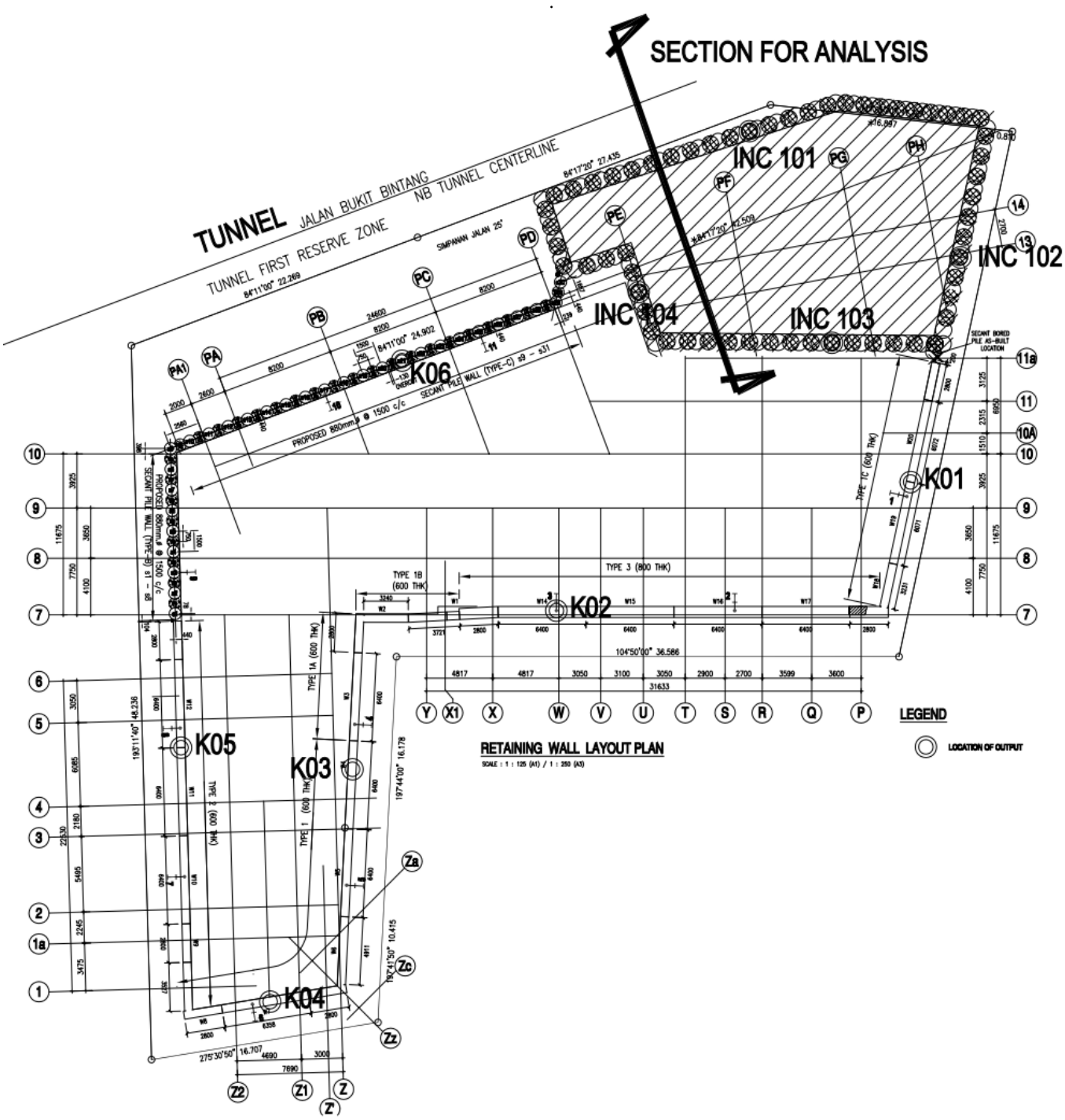


FIGURE 10A SITE H. LAYOUT PLAN

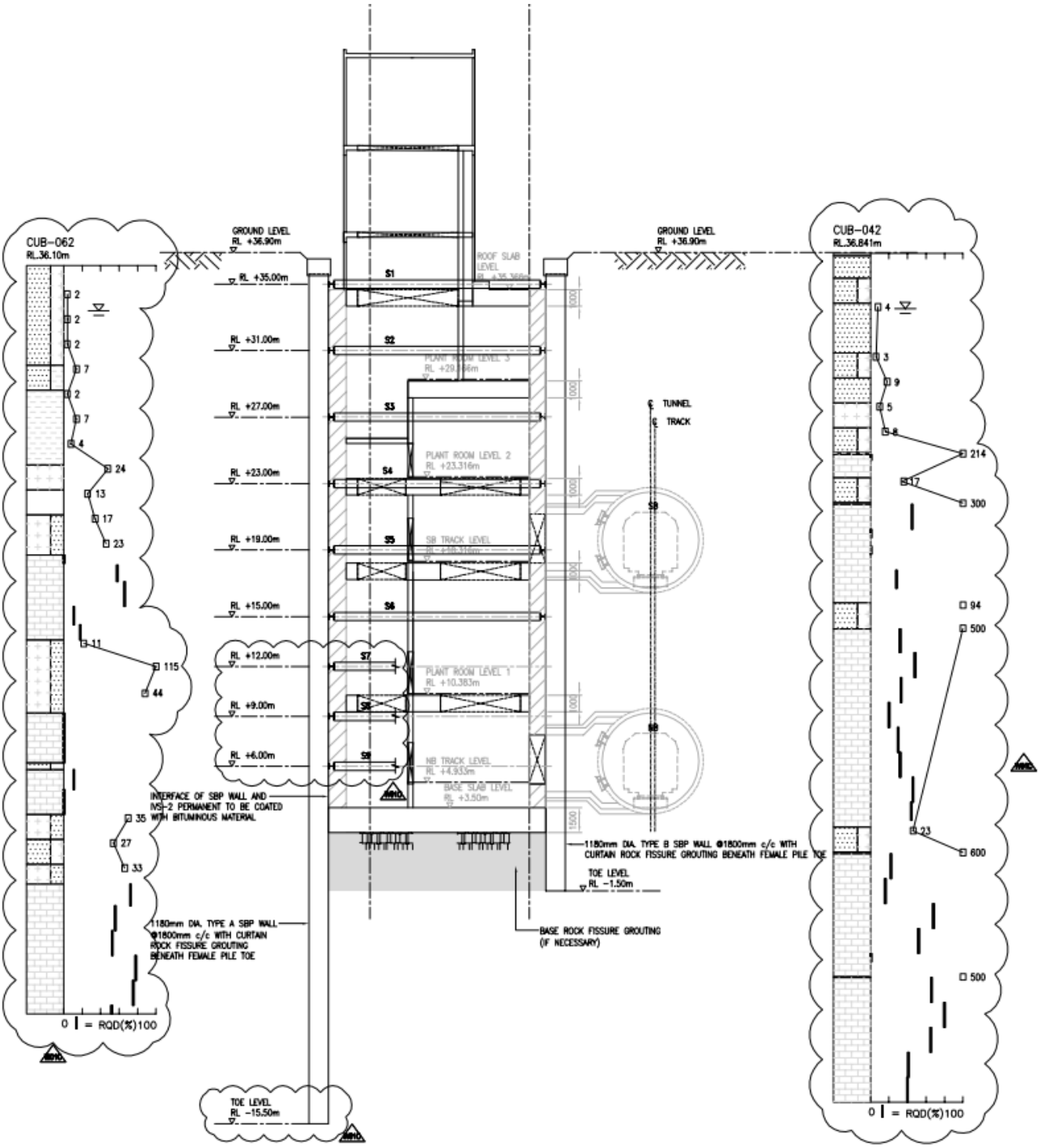


FIGURE 10B SITE H. CROSS SECTION

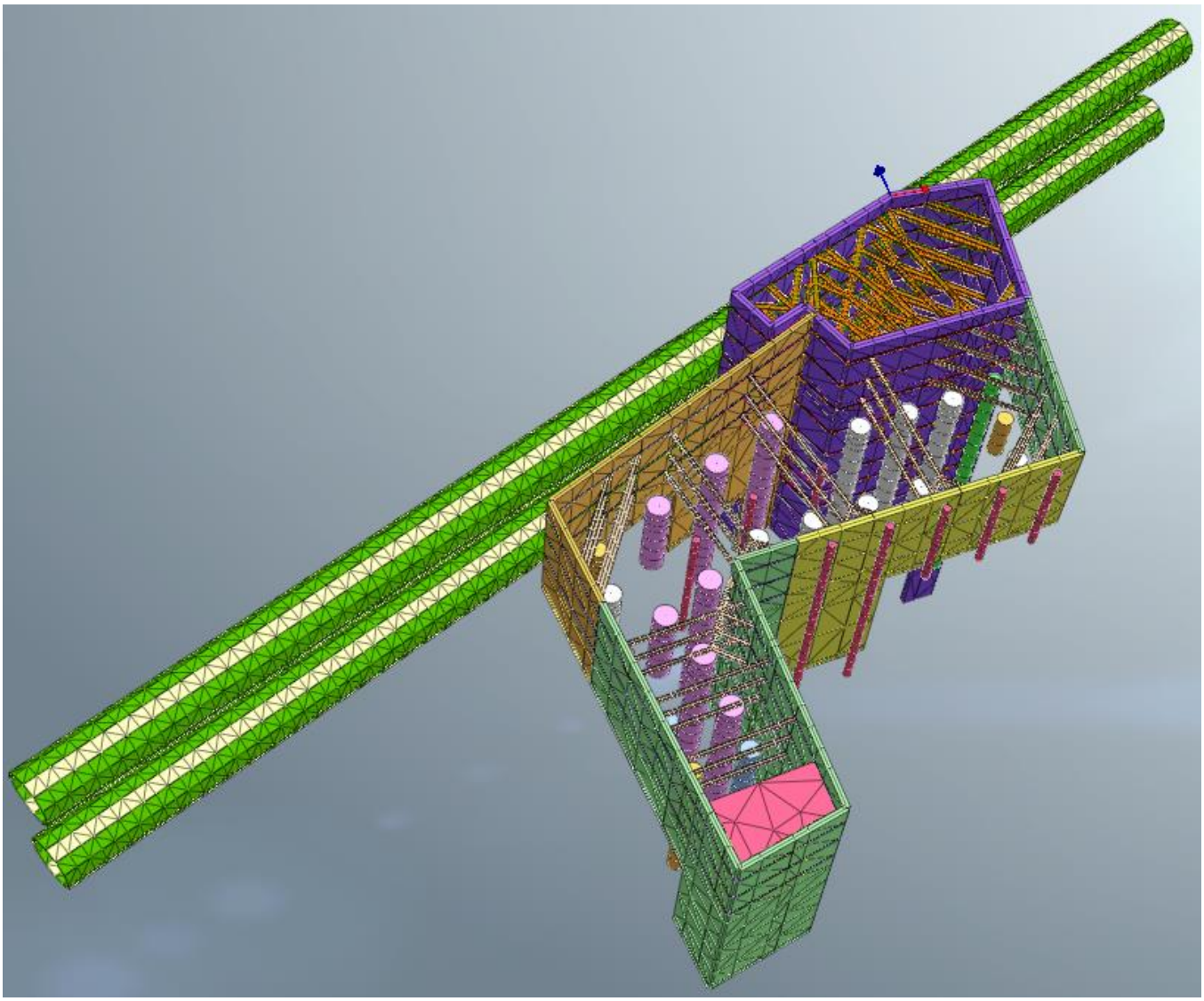


FIGURE 10C SITE H. FINITE ELEMENT MODEL

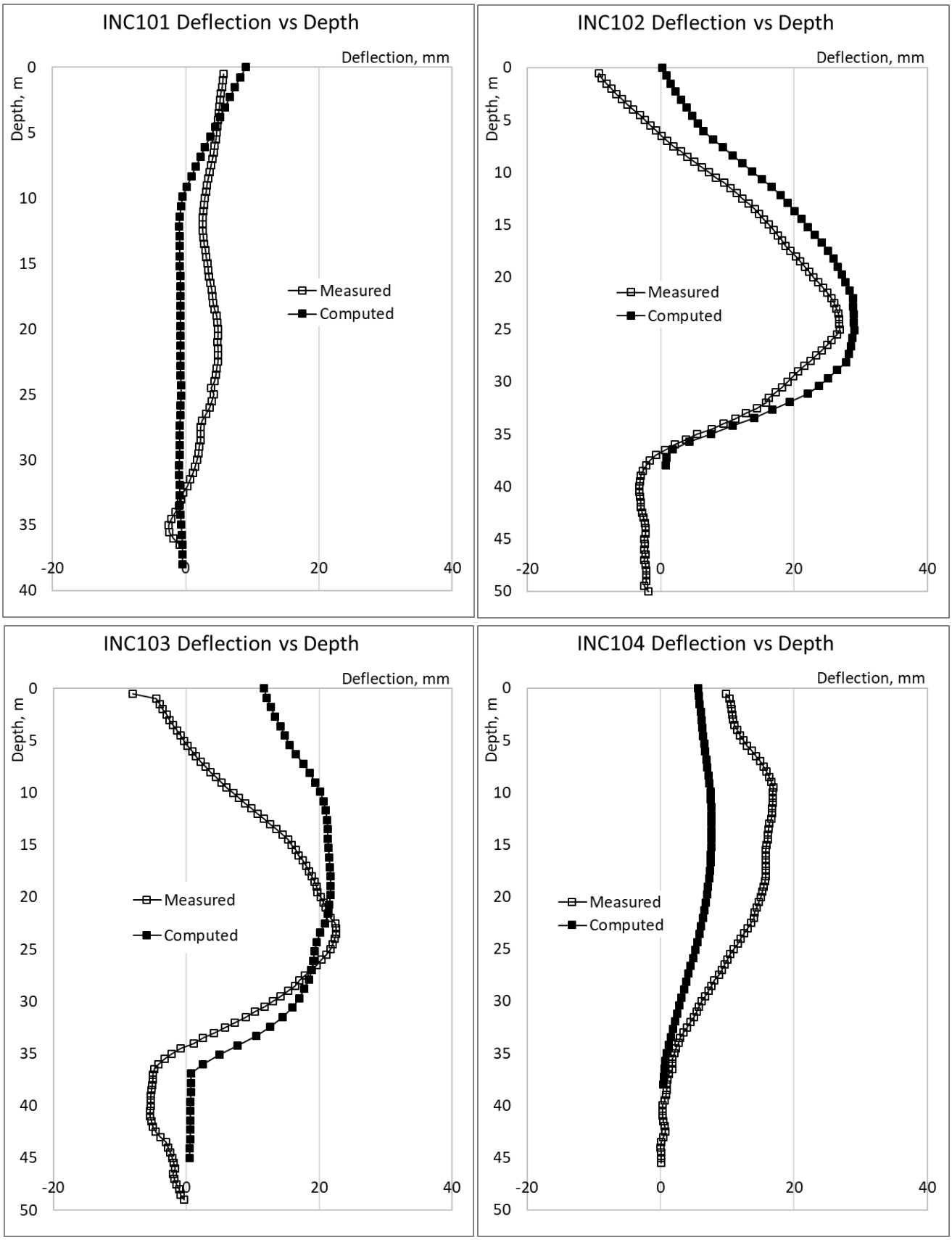


FIGURE 10D SITE H. MEASURED AND COMPUTED DEFLECTION OF SECANT PILE WALL (END OF PHASE 2)

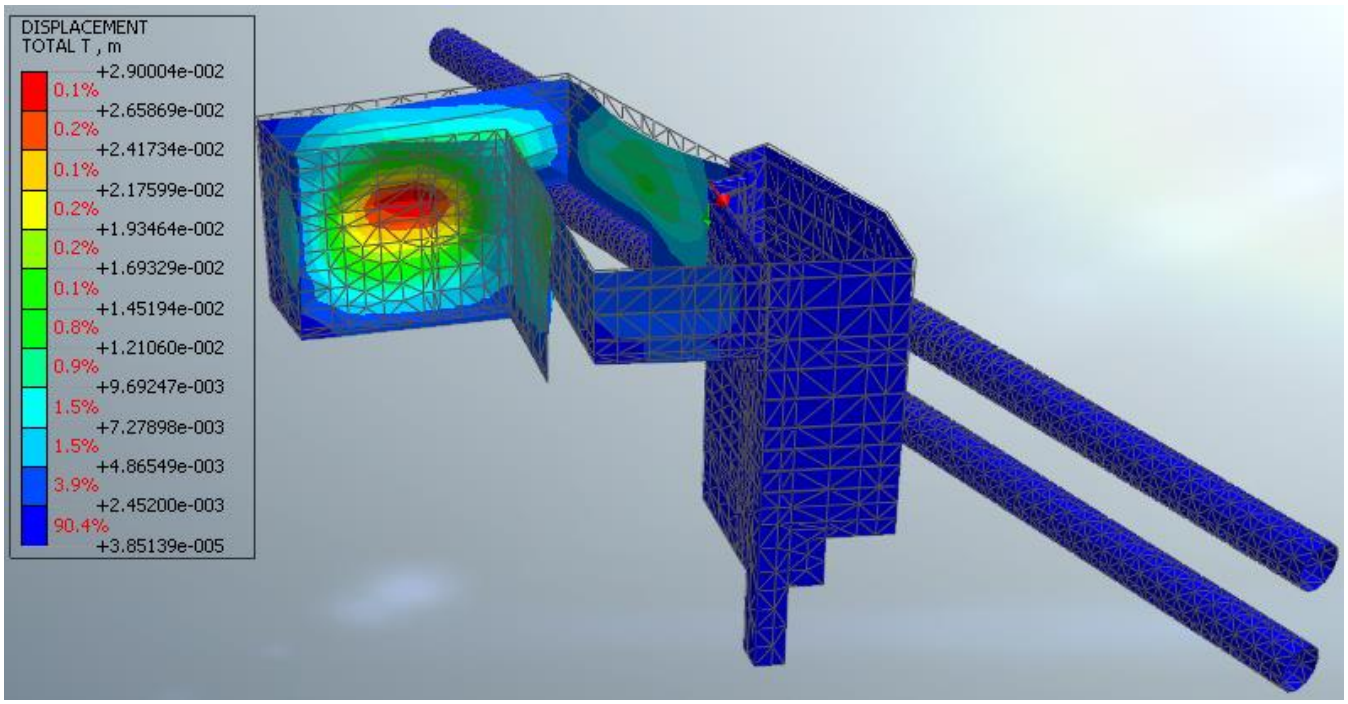


FIGURE 10E SITE H. DEFORMED MESH (END OF PHASE 3)

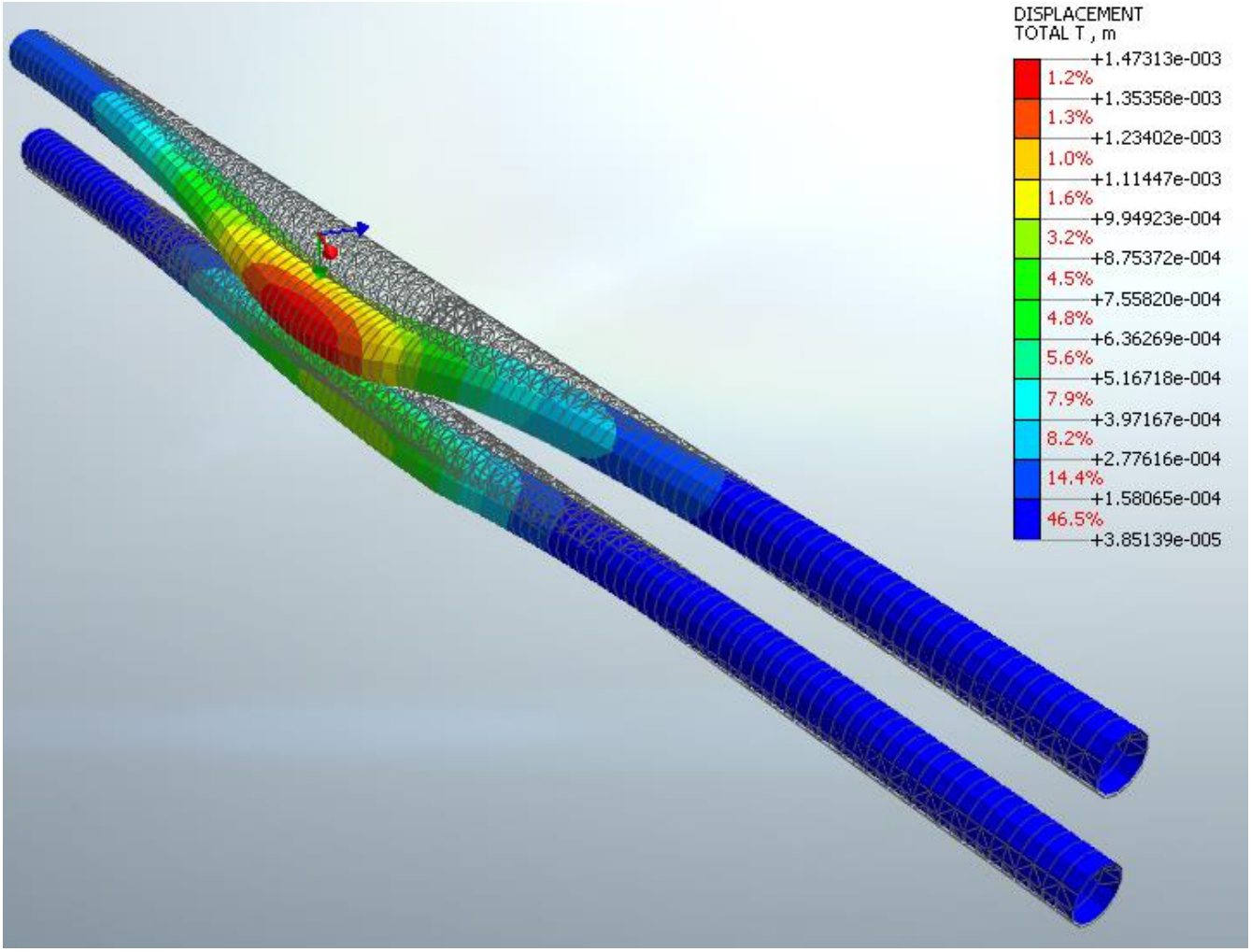


FIGURE 10F SITE H. DEFORMED MESH OF TUNNELS (END OF PHASE 3)

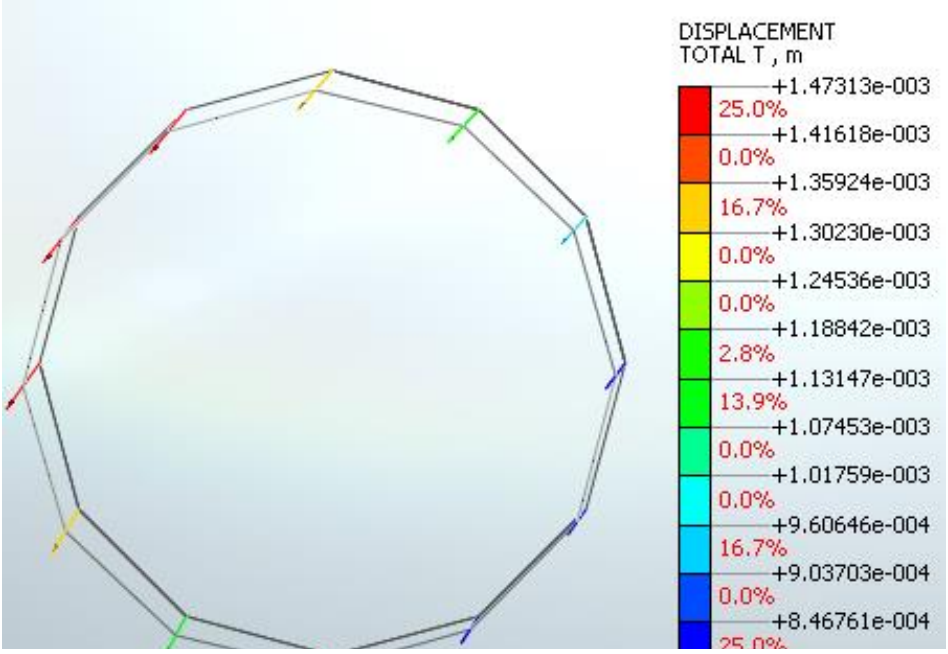


FIGURE 10G SITE H. DEFORMED MESH OF TUNNELS (END OF PHASE 3)

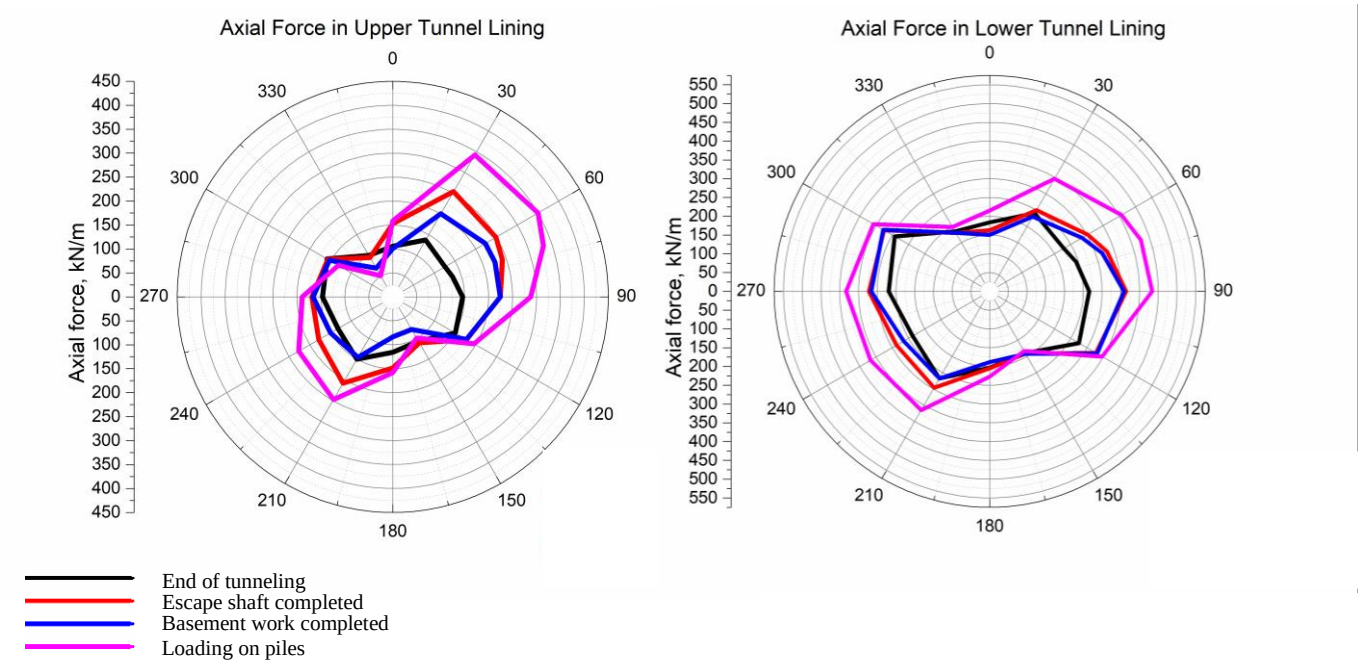


FIGURE 10H SITE H. AXIAL FORCE IN UPPER AND LOWER TUNNEL LINING

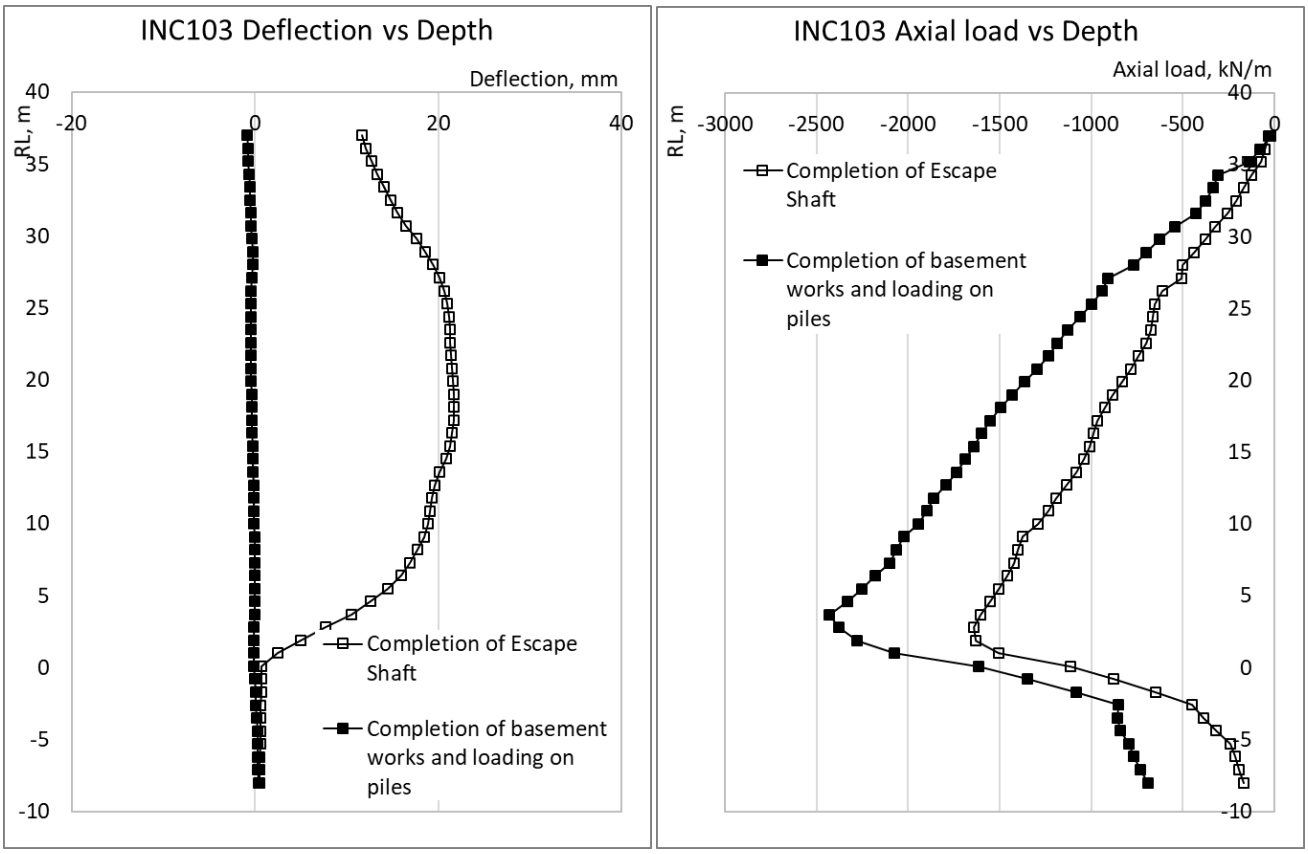


FIGURE 10I & 10J SITE H. ESTIMATED DEFLECTION AND AXIAL LOADS OF ESCAPE SHAFT SECANT PILE WALL DUE TO BASEMENT EXCAVATION

PLATE A STRUTS EQUIPPED WITH JACKS

PLATE B STRUTTED EXCAVATION WITH PRE-STRESSED STRUTS

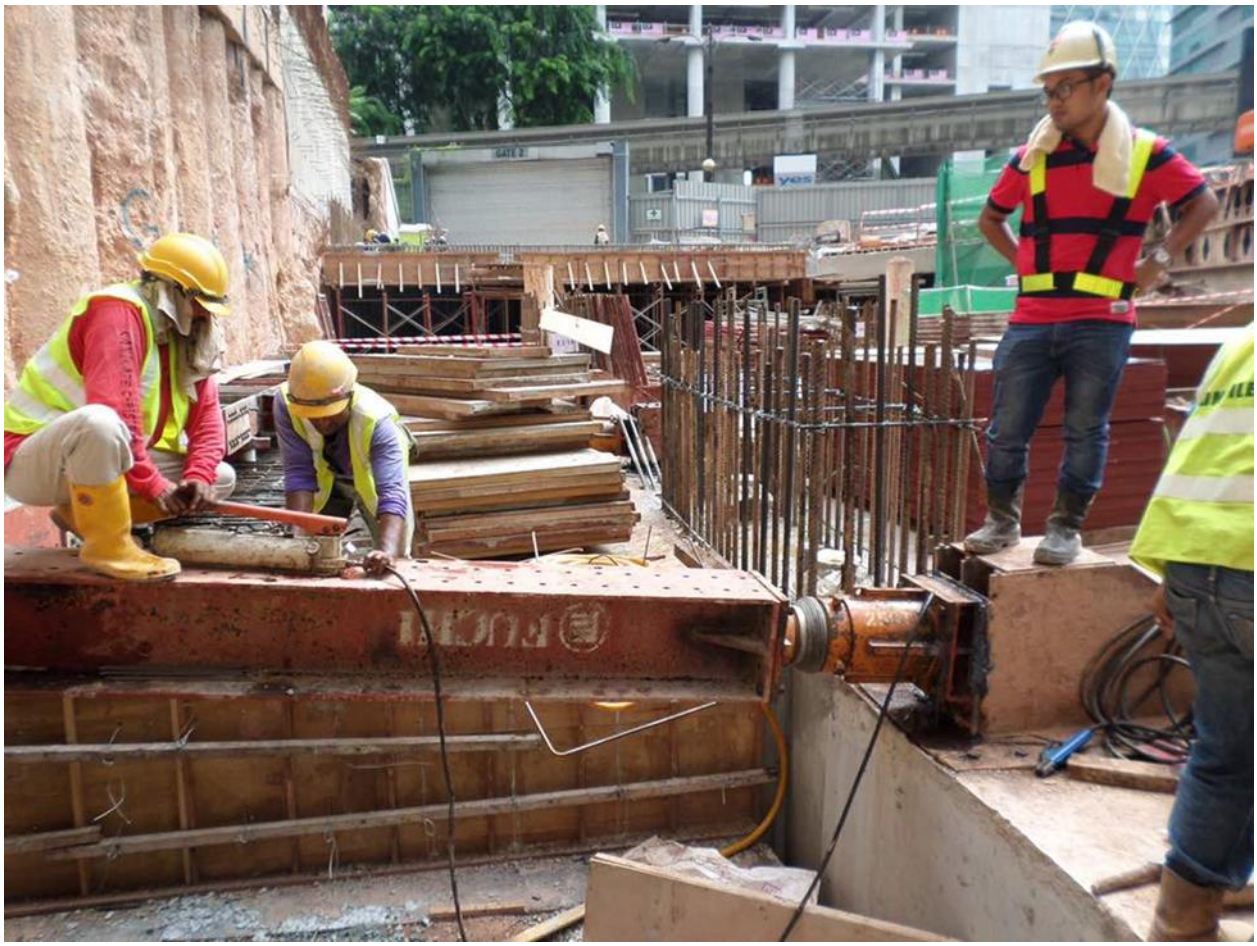


PLATE C PRE-STRESSING STRUT SLAB AS PART OF TOP-DOWN CONSTRUCTION

PLATE D PRE-STRESSING SLAB AS PART OF TOP-DOWN CONSTRUCTION

PLATE E LOW STIFFNESS BUTTRESS

PLATE F LOW STIFFNESS BUTTRESS. CONCRETE STRENGTH = 1 MPA

PLATE G HIGH STIFFNESS BUTTRESS. CONCRETE STRENGTH = 10 MPA

PLATE H HIGH STIFFNESS BUTTRESS. CONCRETE STRENGTH = 10 MPA