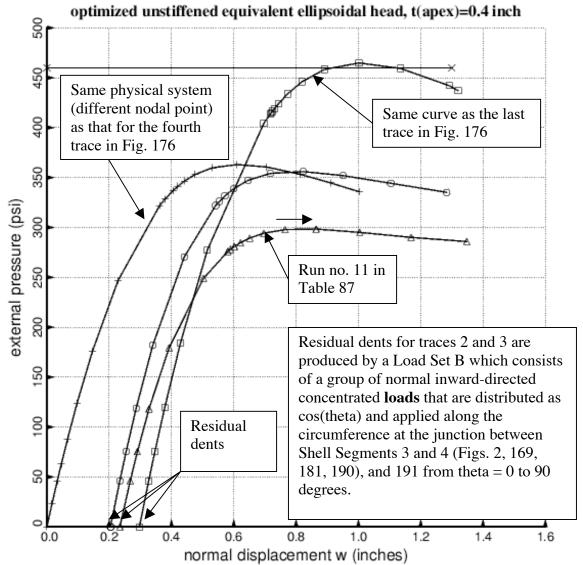Fig. 188 Elastic-plastic analysis of the **optimized unstiffened equivalent ellipsoidal shell with the thick apex with t(apex) = 0.4 inch; Wimp=0.2 inch; the optimum design is listed in Table 78.** Collapse of the imperfect shell with three different kinds of imperfections. trace 1= imperfection is a residual dent caused by a single concentrated load (Fig. 171); traces 2 and 3 = imperfections are residual dents caused by a "cos(theta)" distribution of concentrated loads along a circumferential line from theta = 0 to 90 degrees (Figs. 184 and 186), and trace 4 = a linear buckling modal imperfection with n=1 circumferential wave (Fig. 190). Notice the similarity between traces 2 and 4. These two curves differ mostly by a horizontal shift of w= 0.2 inch, which represents the depth of the residual dent created by the "cos(theta)" distribution of concentrated loads. The "cos(theta)" residual dent is just as harmful as the n=1 buckling modal imperfection.