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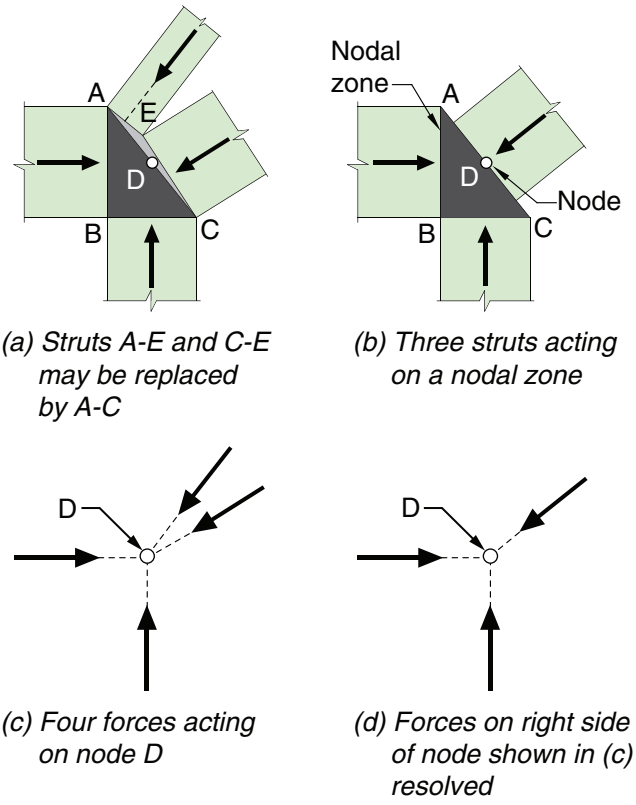
CODE

COMMENTARY



(a) Struts A-E and C-E may be replaced by A-C

(b) Three struts acting on a nodal zone

(c) Four forces acting on node D

(d) Forces on right side of node shown in (c) resolved

***Fig. R23.2.2**—Resolution of forces on a nodal zone.*

23.2.3 Strut-and-tie models shall be capable of transferring all factored loads to supports or adjacent B-regions.

23.2.4 The internal forces in strut-and-tie models shall be in equilibrium with the applied loads and reactions.

23.2.5 Ties shall be permitted to cross struts and other ties.

23.2.6 Struts shall intersect or overlap only at nodes.

R23.2.6 A hydrostatic nodal zone, by definition, has equal stresses on the loaded faces; these faces are perpendicular to the axes of the struts and ties that act on the node. This type of node is considered a hydrostatic nodal zone because the in-plane stresses are the same in all directions. Strictly speaking, this terminology is incorrect because the in-plane stresses are not equal to the out-of-plane stresses.

Figure R23.2.6a(i) shows a C-C-C nodal zone. If the stresses on the face of the nodal zone are the same in all three struts, the ratios of the lengths of the sides of the nodal zone, $w_{n1}:w_{n2}:w_{n3}$, are in the same proportions as the three forces, $C_1:C_2:C_3$.

A C-C-T nodal zone can be represented as a hydrostatic nodal zone if the tie is assumed to extend through the node and is anchored by a plate on the far side of the node, as shown in Fig. R23.2.6a(ii), provided that the size of the plate results in bearing stresses that are equal to the stresses in the struts. The bearing plate on the left side of Fig. R23.2.6a(ii) is used to represent an actual tie anchorage. The tie force can

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