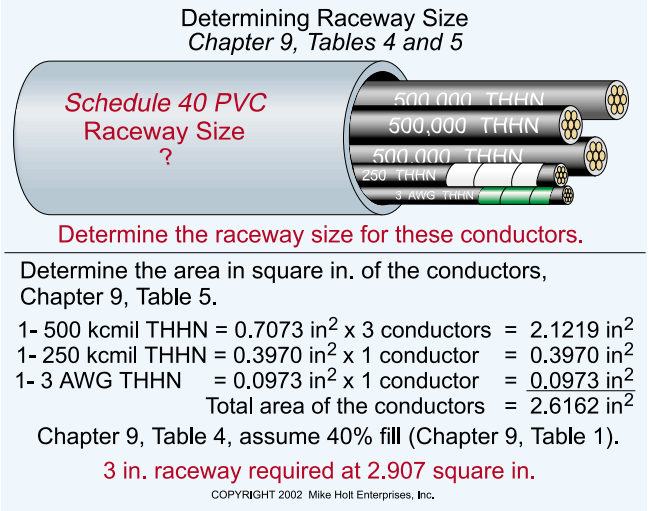

Figure 5-10
Determining Raceway Size

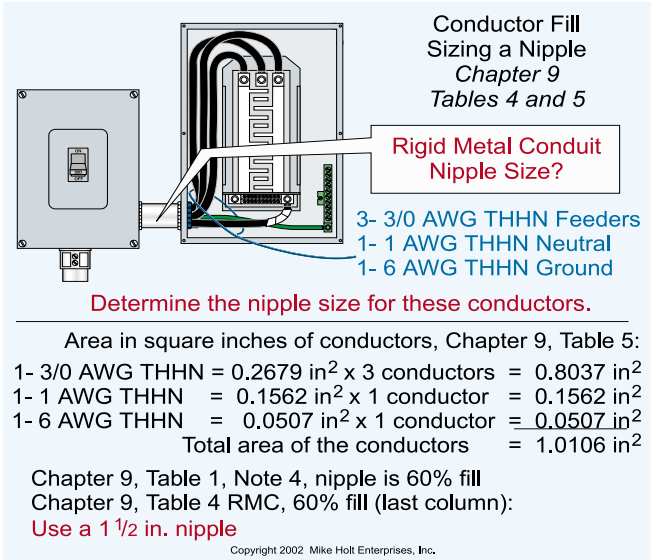

Figure 5-11
Conductor Fill – Sizing a Nipple

❑ Raceway Size

A 400A feeder is installed in Schedule 40 rigid nonmetallic conduit. This raceway contains three 500 kcmil THHN conductors, one 250 kcmil THHN conductor and one 3 AWG THHN conductor. What size raceway is required for these conductors? Figure 5–10.

(a) 2 in. (b) $2^1/_2$ in. (c) 3 in. (d) $3^1/_2$ in.

• Answer: (c) 3 in.

Step 1: Determine the cross-sectional area of the conductors, Table 5 of Chapter.
500 kcmil THHN 0.7073 sq in. × 3 wires = 2.1219 sq in.
250 kcmil THHN 0.3970 sq in. × 1 wire = 0.3970 sq in.
3 AWG THHN 0.0973 sq in. × 1 wire = 0.0973 sq in.

Step 2: Total cross-sectional area of all conductors = 2.6162 sq in.

Step 3: Size the conduit at 40% fill [Chapter 9, Table 1] using Table 4.
3 in. Schedule 40 PVC has an cross-sectional area of 2.907 sq in. for conductors

❑ Nipple Size

What size rigid metal nipple is required for three 3/0 AWG THHN conductors, one 1 AWG THHN conductor and one 6 AWG THHN conductor? Figure 5–11.

(a) $^1/_2$ in. (b) 1 in. (c) $1^1/_2$ in. (d) 2 in.

• Answer: (c) $1^1/_2$ in.

Step 1: Cross-sectional area of the conductors, Table 5 of Chapter 9.
3/0 AWG THHN 0.2679 sq in. × 3 wires = 0.8037 sq in.
1 AWG THHN 0.1562 sq in. × 1 wire = 0.1562 sq in.
6 AWG THHN 0.0507 sq in. × 1 wire = 0.0507 sq in.

Step 2: Total cross-sectional area of the conductors = 1.0106 sq in..

Step 3: Size the conduit at 60% fill [Table 1, Note 4 of Chapter 9] using Table 4.
$1^1/_4$ in. nipple = 0.0916 sq in., too small
$1^1/_2$ in. nipple = 1.243 sq in., just right
2 in. nipple = 2.045 sq in., too big