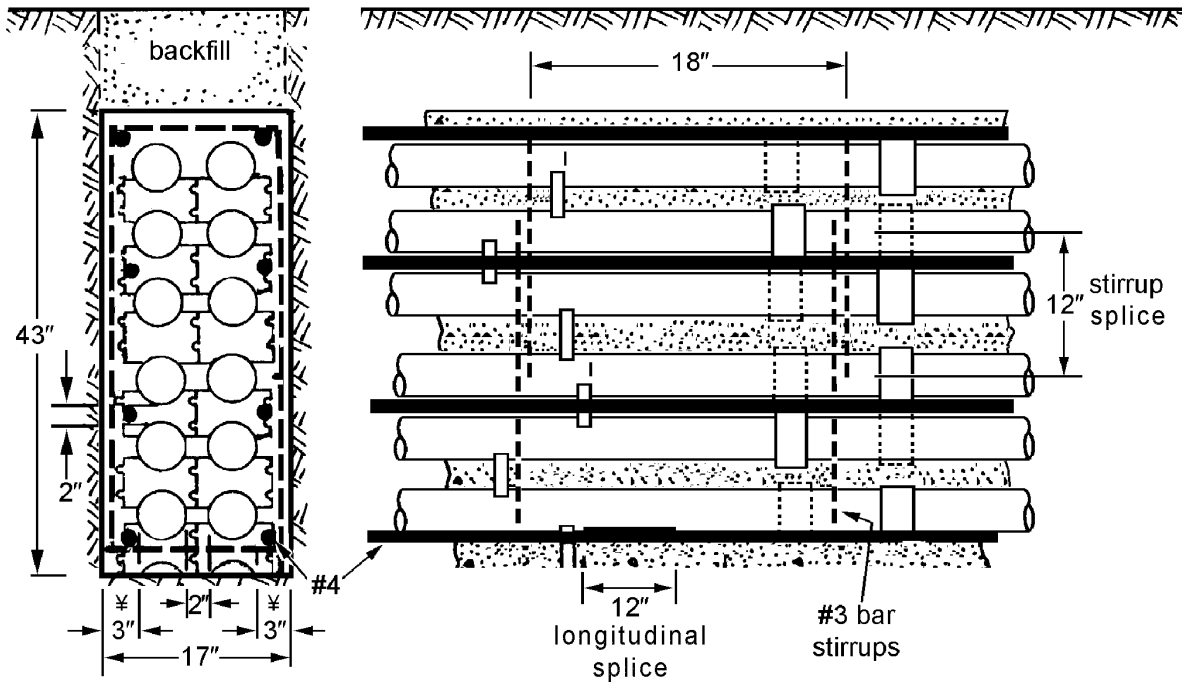


**REINFORCEMENT OF CONCRETE ENCASED DUCT RUNS**

1. When the engineer determines that concrete encased duct runs need reinforcement, the reinforcement shall consist of #4 Grade 40 or Grade 60 deformed bars placed longitudinally in the duct run and tied with #3 closed stirrup at 18 inches on center. All reinforcing shall conform to ASTM Specification A 615-82.
2. The number of longitudinal bars per duct section shall be the next highest even number to that number determined by the equation  $N = 0.12 (W+D) - 0.72$ , where N = number of bars, W = width of duct, and D = depth of duct envelope in inches.
3. The first four bars shall be placed in the corners of the concrete envelope. All bars thereafter shall be equally spaced between the corner bars. The longitudinal bars shall have a minimum of 2 inches of concrete cover. Minimum splice length for #3 and #4 bars shall be 12 inches. Longitudinal splices are to be staggered 6 inches or increase overlap to 18 inches. Rebar shall be embedded in vault structure around duct penetration.
4. Red dye shall be added to the concrete mix at the rate of 4 pounds per yard.
5. Example: Assume duct envelope is 17 inches wide and 43 inches deep  
 $N = 0.12 (17 + 43) - 0.72 = 0.12 (60) - 0.72 = 7.20 - 0.72 = 6.48$   
 Use 8 - #4 bars



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