Complete Anchor Bolt Replacement

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When anchor bolt failure is such that complete replacement is necessary, it can be accomplished using techniques consistent with the sketch shown in Figure 1. This sketch is of a typical replacement anchor bolt in an ideal installation. Complete replacement of an anchor bolt is possible without lifting or regrouting the machine. This is accomplished by drilling large diameter vertical holes, adjacent to the anchor bolt to be replaced and tangent to the boss of the machine. Once the cores have been removed, access is gained to concrete surrounding the anchor bolt. After the surrounding concrete is chipped away, a two-piece and sleeved anchor bolt is installed. After the replacement anchor bolt has been installed, epoxy grout is poured to replace the concrete chipped from around the original bolt and to replace the concrete removed by the coring.

This procedure utilizes an air powered diamond coring machine as illustrated in Figure 2. Because the machine is air powered, it can be used in hazardous environments without creating a danger from sparks of open electric motors. Further, because a lot of power can be delivered by small air motors, the size of the coring machine is relatively small. With proper gear reduction, a hole as large as 16 inches in diameter can be drilled with this machine. Figure 3 is a photograph of 12 inch diameter cores that have been removed with this machine. In the course of obtaining these cores, it was necessary to core through #11 (1.375" dia.) rebar, a cross section of which can be seen in this photograph.

Fig. 2: A photograph of an air powered diamond coring machine used in replacing anchor bolts without regrouting the machinery.

Figure 4 is a photograph of a dual anchor bolt installation where both anchor bolts have been replaced and grouting is in progress. This photograph was taken after the first pour of epoxy grout. Note that sleeving has not yet been installed on the upper stud above the coupling nut. Before the second pour was made, a split closed-cell polyurethane sleeve was installed to isolate the upper stud and coupling.

Fig. 3: A photograph of 12 inch dia. cores removed in the course of complete replacement of an anchor bolt. Note the cross section of a No. 11 rebar in the core.

Fig. 4: An in-progress photograph of the replacement of dual anchor bolts after the first pour of epoxy grout. The isolation sleeving has not yet been installed.

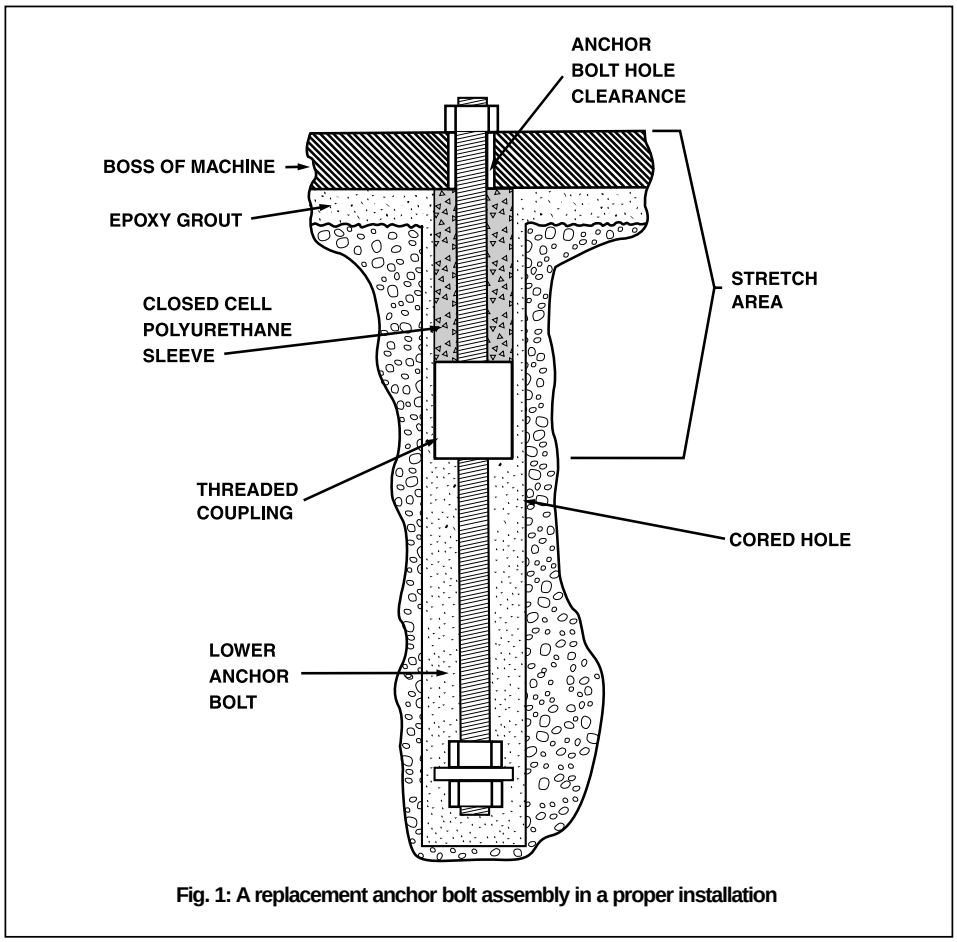

Fig. 1: A replacement anchor bolt assembly in a proper installation

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