

Utility Vault Rehabilitation with Polyurea Coatings

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Figure 1



Figure 2



Figure 3



Figure 4

Underground, or below grade utility vaults are concrete boxes that house valves, gauges and connections for electrical, water and natural gas transmission. Due to microtectonic forces, compression from road traffic and other forces, the concrete cracks and degrades. The cracked areas become the site of ground water infiltration. The ground water infiltration becomes especially problematic in electrical and telephone utility vaults, as it can be a cause of outages and disrupted service. Additionally, water in electrical vaults can be dangerous.

In (Fig.1), we can see the transmission lines and conduits, traversing a normal natural gas vault. The vault has been experiencing active groundwater infiltration, especially during storm events. After grouting in areas of known infiltration, patching with a hydraulic concrete in two seriously spalled areas and water blasting at 3000 psi, the vault was prepared for priming and coating with polyurea. In addition to the preparation steps already discussed, it is important to "mask-off" and protect sensitive or functional parts of the vault from overspray. In (Fig. 2) we protected pressure gauges by covering with sheets of polyethylene.

Polyurea coatings are fast curing, 100% solids, moisture and temperature insensitive. Additionally, this new family of polymers can be formulated to be soft "rubber-like" elastomers in the range of Shore A Hardness 65, to hard rigid polymers in the Hardness range of Shore D 75. Polyureas can be pigmented, so a large range of colors are available. We use white reflective PCS-355 or PCS-325 in vaults because it will throw the most light into the structure to facilitate working in this environment. Finally, an important advantage of polyurea coatings, is that the coating is coating "built in place", during the spray application. Therefore, each application is "customized" to the unique geometry of each vault and arrangement of transmissions lines. (Fig. 3 & 4).

No matter if the vault contains round areas or square areas that are deep or shallow (Fig. 5 & 6), PCSI polyurea coatings will put a fast curing, seamless and reflective coating that will facilitate working in the vault and mitigating the effects of groundwater infiltration while structurally enhancing the stress fractures common to all below-grade concrete structures.



Figure 5

Figure 6