

## Material Specification – 28 for CONCRETE VAULTS

**1. GENERAL:**

The materials used to construct the vault shall conform to [MS-19](#) and [MS-20](#). Manholes, reducing sections, ladder rungs and traffic lids shall be precast and shall conform to ASTM C 478. If Denver Water requires it, the vaults shall be cast with a removable lid section for future access. The vault as a whole, and the individual components, i.e., the lid, walls and base slab, shall be adequately designed to handle all applicable loads. The concrete vault design calculations shall be furnished to Denver Water.

**2. TRAFFIC LIDS AND ROOFS:**

All traffic lids and roofs shall be designed for H 20 loading in accordance with AASHTO Standards. The roof slab shall be a minimum of 8 inches thick.

The opening through the roof shall be 36 inches in diameter. Additional reinforcement shall be added around the opening at 45 degree angles to the edges. This shall extend a minimum of 2 feet beyond the opening or the ends of the reinforcing bars shall be standard 180 degree hooks.

If a removable lid is required, the lid shall be cast in sections. The sections shall be cast such that their individual weight does not exceed 7,500 pounds, assuming reinforced concrete weighs 150 pounds per cubic foot. Three inch diameter holes shall be provided in the sections for lifting. The holes shall be perpendicular to the face of the lid surface. The holes shall not displace any of the required reinforcement nor should it protrude from either face of the roof. The holes shall be placed in such a manner that when lifting cables are being used there is an equal weight distribution on all cables.

**3. WALLS:**

All four walls on cast in place vaults shall be cast in one continuous placement. All corners shall have added reinforcement. The walls shall be doveled into the floor. Precast vault walls shall be connected together by a plate and bolt type arrangement. Precast walls shall be appropriately secured to the floor slab.

The minimum wall thickness is 5 inches with the reinforcement being at least one inch from the inner face of the vault.

**4. BASE SLAB:**

The base slab shall be cast in place or precast conforming to [6.32](#) and [Sheets 42, Sheet 43](#) and [Sheet 45](#) of the [Standard Drawings](#).

The manufacturer may cast vaults in which the base slab is integral with the wall sections.

**5. ACCEPTABLE MANUFACTURERS:**

Rinker Materials

Amcor Concrete Products (including 7800 Tunnel Vault)