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## Duct Bank Termination

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### 1. Scope

This standard provides instruction on how to terminate duct banks into vaults and handholes. This standard applies to new or existing ring, panel and cast-in-place vaults.

Duct bank construction is outside the scope of this standard. See 0222.02.

Duct bank reinforcement is outside the scope of this standard. See 0222.04.

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### 2. Application

This standard is directed at SCL engineers, crews, and contractors who will be terminating duct banks into new or existing vaults and handholes.

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### 3. Requirements

#### 3.1 General

Duct banks shall be structurally connected to the vault wall using a shear connection that prevents the duct bank from separating from the vault.

Shear connections shall consist of rebar dowels or steel conduits on each corner of the duct bank, or more depending on the size and configuration of the duct bank.

Rebar shall be minimum of #4 in size and attached with epoxy to the wall.

Panel vaults constructed after 2018 as well as ring vault side walls typically have 1/2-inch diameter embedded inserts around the knockouts. These inserts can be used in lieu of coring and epoxy doweling the rebar. See figures 3.1 a and 3.1b for examples.

Steel conduits shall terminate flush with the interior wall surface.

Empty duct banks shall have cable protectors labeled with the destination installed.

Knockout voids and core drill hole gaps shall be filled with non-shrink structural grout.

Do not cut into the wall within 5-1/2 inches of the ring vault structural rib seams. See figures 3.1d and 3.1e.

To maintain the structural integrity of the vault, duct banks shall be terminated into knockouts when available.

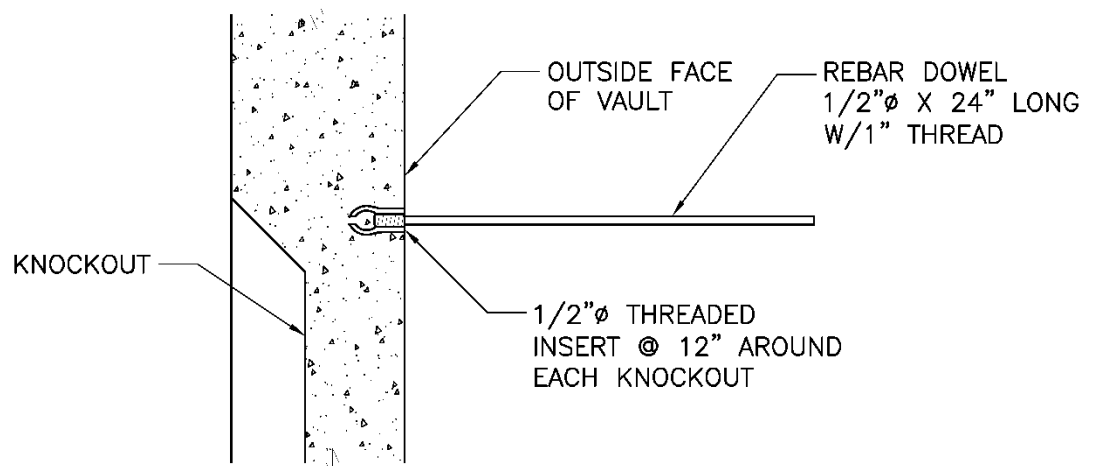
Existing cast-in-place vaults generally do not have "designated" knockouts. If terminating outside of knockouts for cast-in-place, panel, or ring vaults, contractor shall submit a drawing of the proposed duct bank penetration and the vault wall to an SCL civil engineer for review and approval.



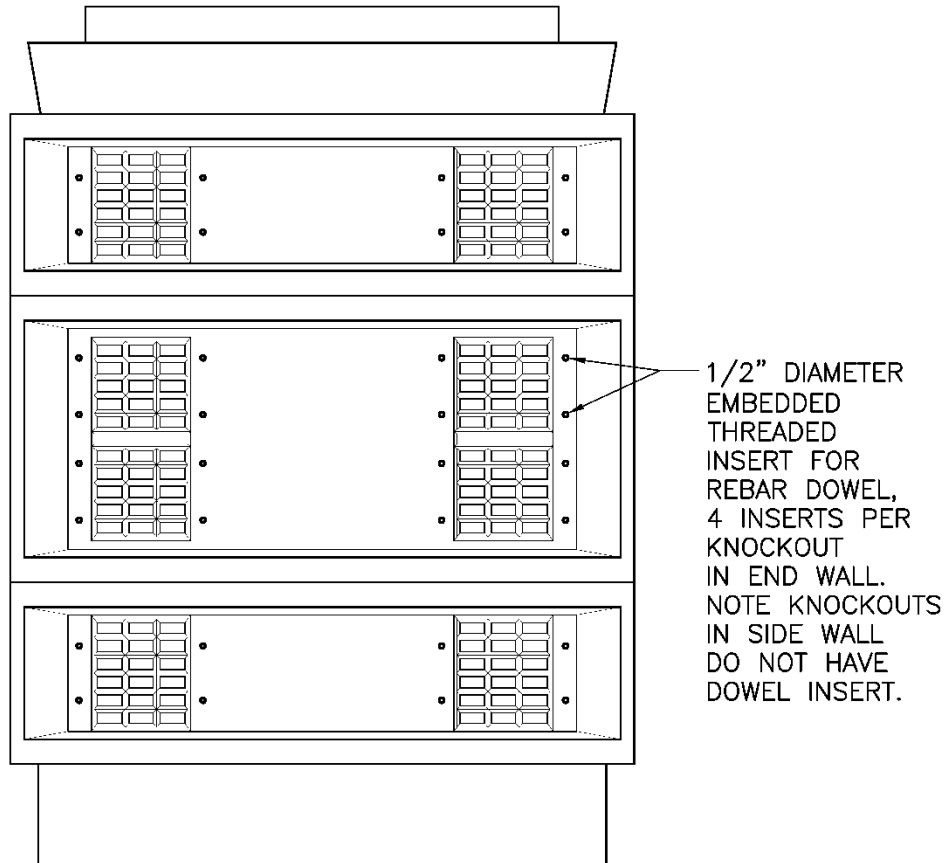
The following requirements shall be followed in such cases:

- Vault wall rebars shall be located with a non-destructive rebar locator instrument.
- Individual conduit holes shall be core-drilled to avoid cutting wall rebars. Saw-cutting a large knockout is prohibited.
- Reinforcement for panel vault pulling irons shall be a three (3)-foot-wide vertical band and contain no knockouts. Contractor shall not core drill within this critical zone.
- Any wall that is core-drilled is considered structurally compromised. In such cases, the pulling iron shall be removed from the wall. See Figure 3.1c for details.

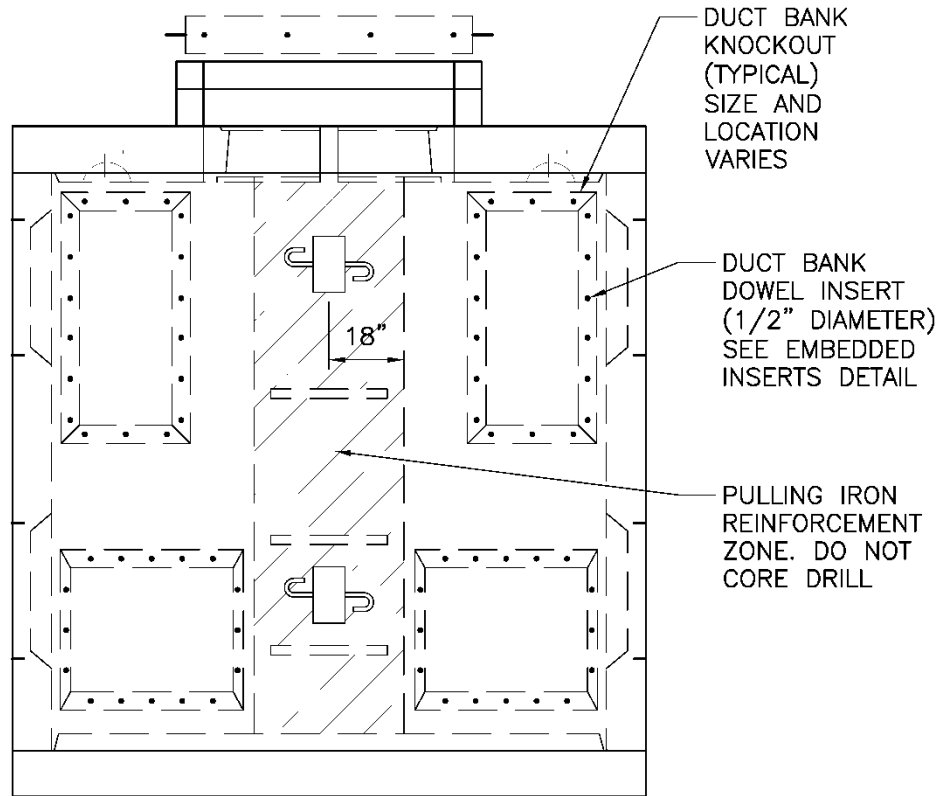
**Figure 3.1a. Embedded Insert Details**



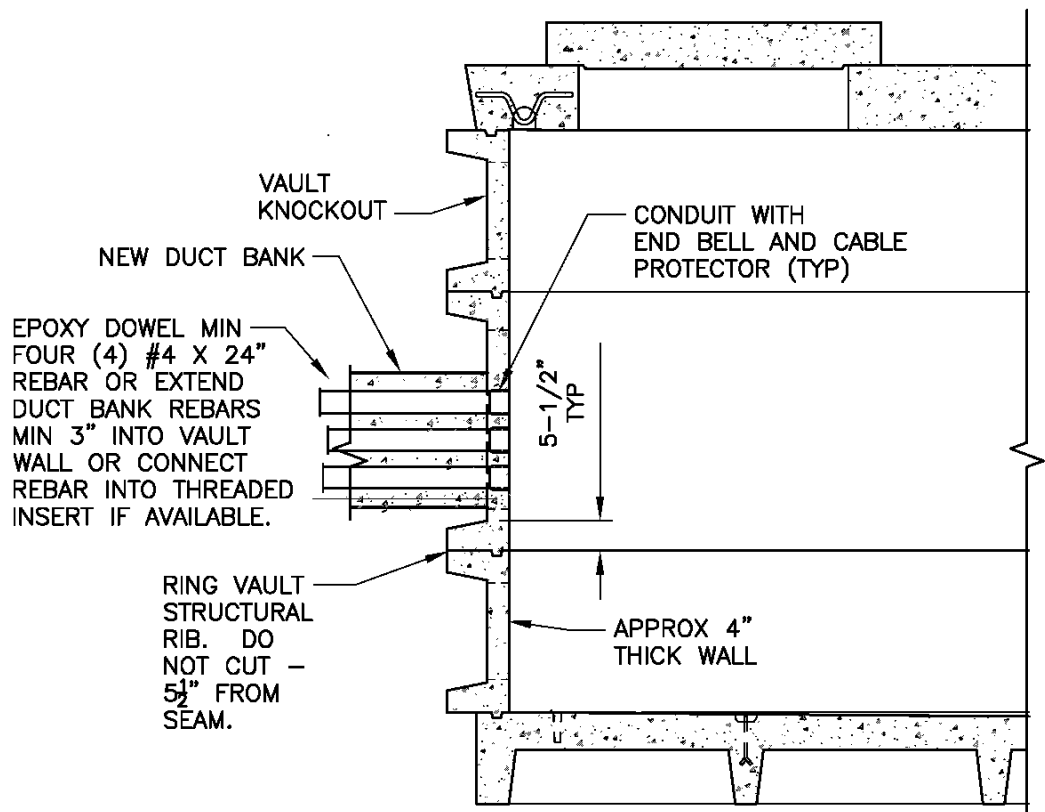
**Figure 3.1b. Embedded Insert Locations**



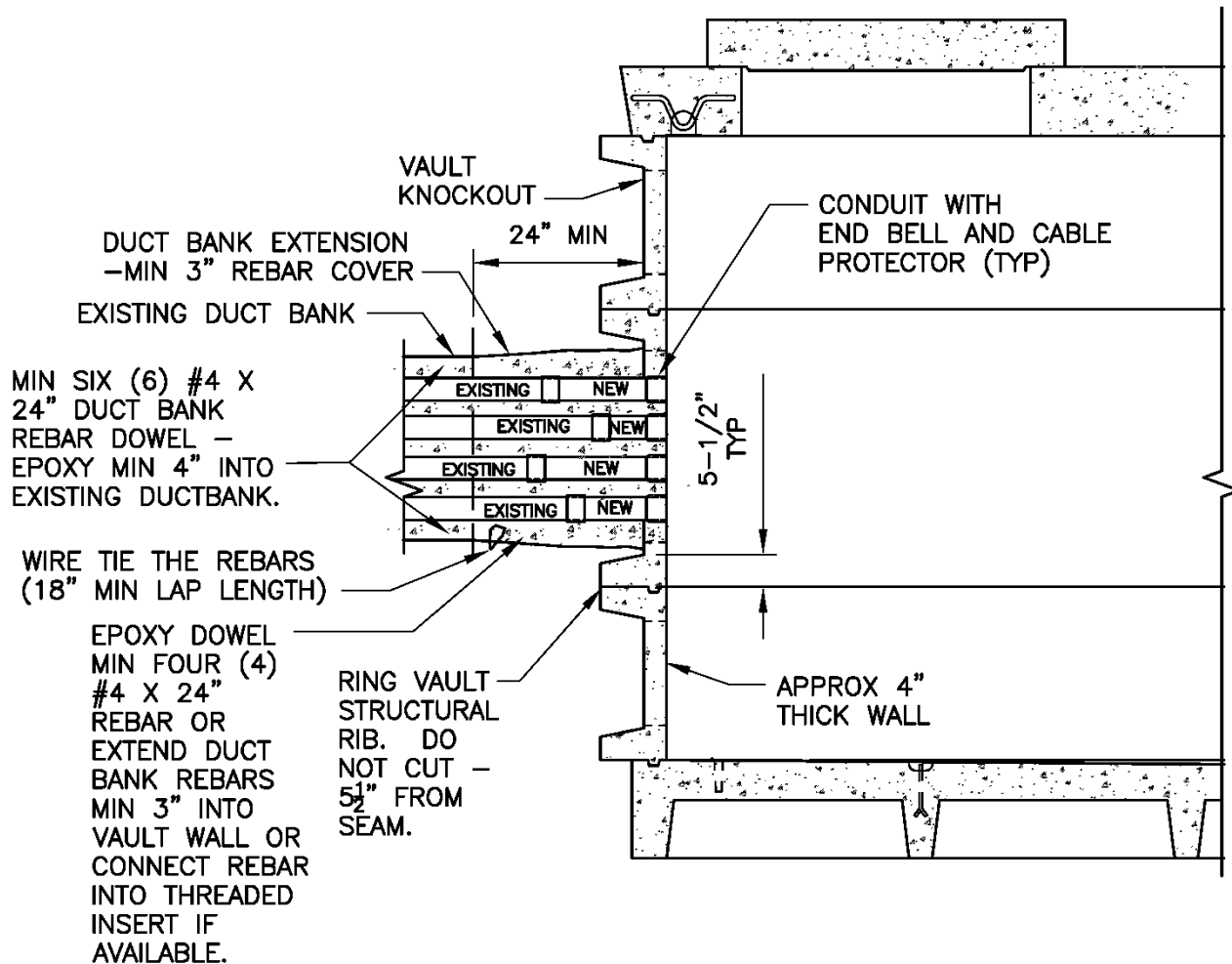
**Figure 3.1c. Pulling Iron Zone**



**Figure 3.1d. New Vault Duct Bank Termination**



**Figure 3.1e. Existing Vault Duct Bank Termination**



### 3.2 Specific Duct Type Requirements

When enlarging or installing new handholes and/or vaults, all new and existing duct banks shall be terminated in the new structure using the corresponding method below. This shall apply to all duct banks unless noted otherwise.

For all duct bank types, six (6) 1/2-inch steel rebars shall be located as shown in the figures and terminated 3 inches from the face of the wall.

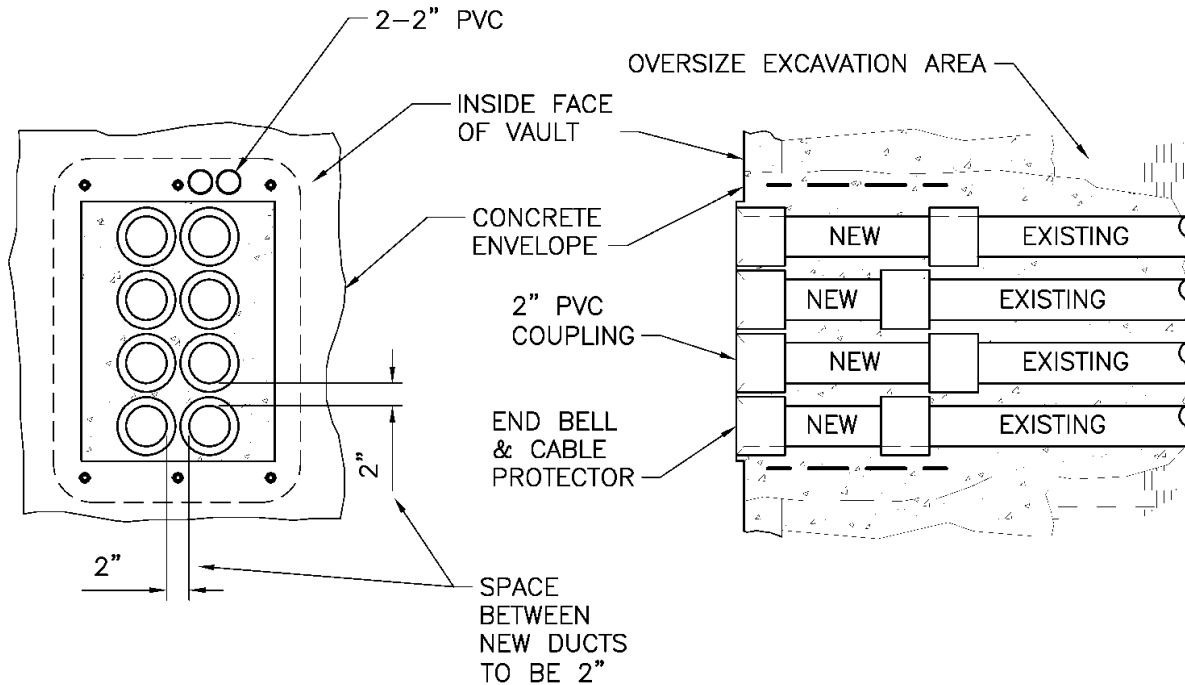
#### 3.2.1. Round Duct Banks

Duct banks, regardless of the material, shall be cut back to allow for installation of the vault and later extended into the structure. The extension shall be encased in a minimum of 3 inches of high-strength FTB.

All duct banks shall be end-belled flush with the inside wall of the structure. Two-inch duct banks shall be end-belled with a coupling. This is to allow the possible connection of a pump discharge.

Existing duct bank encasements shall be painted with an undiluted polyvinyl acetate bonding agent (e.g., Weldcrete) prior to pouring the new concrete. See Figure 3.2.1 for details.

**Figure 3.2.1. Round Duct Bank Termination**

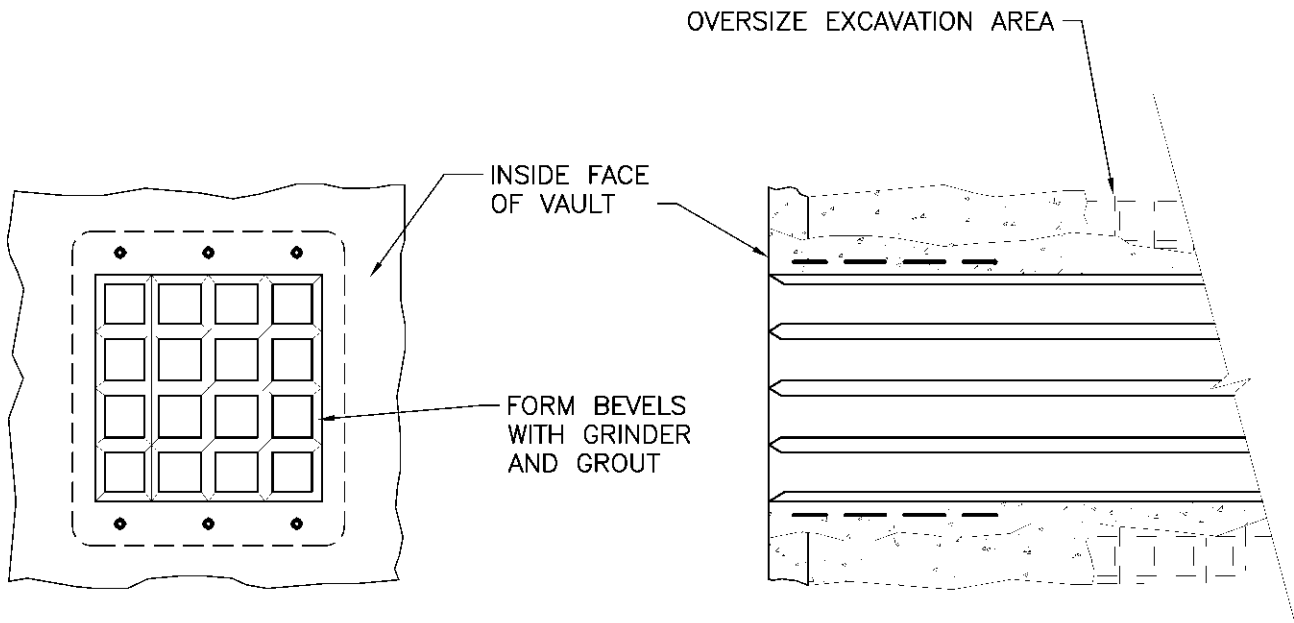


**3.2.2. Square Tile Duct Banks**

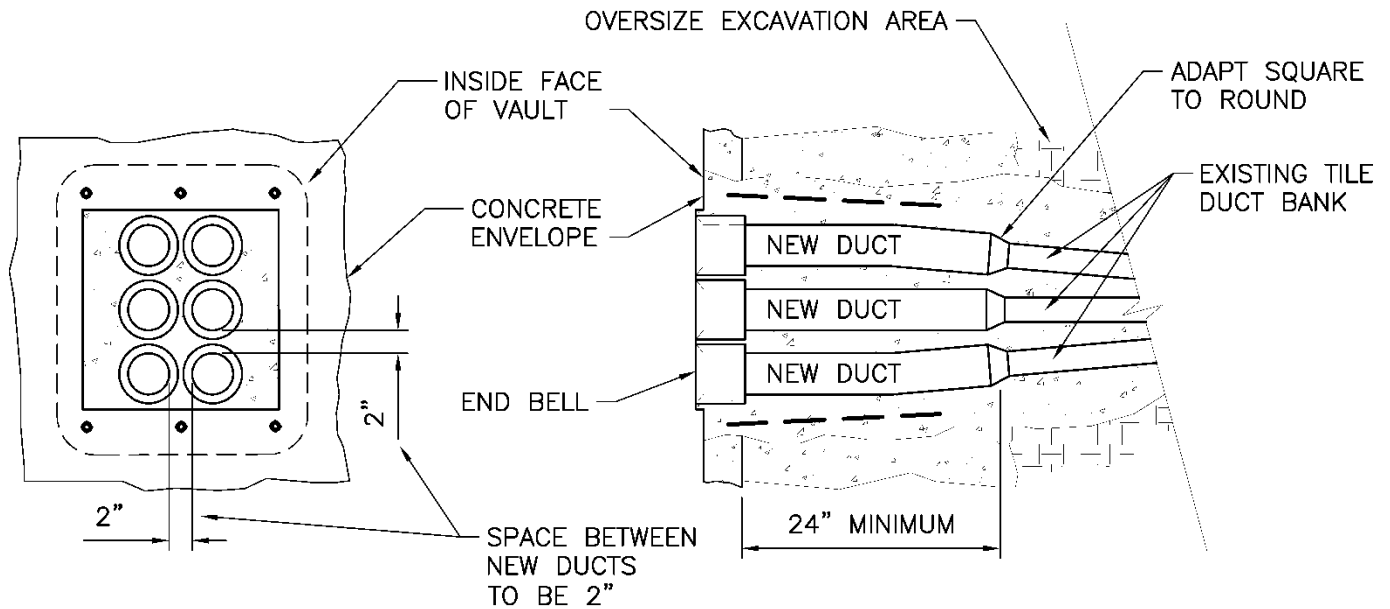
Existing duct banks shall be cut square with the inside wall of the structure and shall be beveled by grinding and/or adding grout to form a bevel. See Figure 3.2.2a for details.

With the approval of Network Engineering Management, the duct bank can be removed back to the next joint no closer than 24 inches from the vault wall and a square-to-round adapter (Stock No. 734565) installed. New round duct banks shall be attached to the adapter and terminate as round duct banks. See Figure 3.2.2b for details.

**Figure 3.2.2a. Square Tile Duct Bank Termination**



**Figure 3.2.2b. Alternate Square Tile Duct Bank Termination**



#### 4. References

**SCL Construction Standard 0222.02**; "Requirements for Primary Conduit and Duct Bank Installation"

**SCL Construction Standard 0222.04**; "Duct Bank Reinforcement"

#### 5. Sources

**Lu, Curtis**; SCL Standards Engineer and originator of 0222.06

**Ng, Sharon**; SCL Senior Civil Engineer and subject matter expert for 0222.06

**SCL Construction Standard U2-11.3/NDK-30** (canceled); "Termination of Existing Ducts in New Vaults or Manholes"

**SCL Material Standard 7203.81**; "Precast Reinforced Concrete Panel Vaults"