



**STRUCTURAL ENGINEERING
ASSOCIATES, INC.
CONSULTING ENGINEERS**

3838 N.W. LOOP 410
SAN ANTONIO, TX 78229

E-mail: (210) 735-9202
sea@seatx.com FAX (210) 735-2074

TBPE FIRM REGISTRATION No. F-199

DAVID T. COVARRUBIAS, P.E.
SALVADOR H. LOPEZ
SIDNEY "SID" A. MIELKE, P.E.
MARTIN R. COVARRUBIAS, P.E.
ALLEN G. SHIAU, P.E.
WILLIAM "MAC" M. GLEESON, P.E.
SAM O. PALOMERO, P.E.
MD NURUL AMIN, P.E.
JOHNNY E. MARTINEZ, P.E.
DANIEL B. RODRIGUEZ, P.E.
JAIME OZUNA JR., P.E.

JOHNNIE C. CHING, P.E.
CHARLES F. GARZA
ERNEST J. MECHE, P.E.
DAVID A. ROCHA, P.E.
ERIC H. JAHNELKA, P.E.
ADRIAN M. ROMERO, P.E.
MELVIN K. LARA, P.E.
ALVARO J. LOPEZ, P.E.
DANIEL M. MORALES, P.E.
BINAYA SHRESTHA, P.E.

03/16/2018

Project Name: SAWS - Dos Rios Digester No. 6 Tank Evaluation

Digester No: 6

Job No: 18-122C

Site Visit Date: 01/24/2018, 08:00AM-09:00AM

Present at Site: Umit Can Oksuz, P.E. (SEA), Eric Jahelka, P.E. (SEA)

STRUCTURAL SITE VISIT REPORT

Structure Description: Digester No. 6 is one of eight digesters located at SAWS Dos Rios Water Recycling Center. The first row of four digesters, which includes Digester No. 6, are located 186.0 ft. North of the second row of four digesters. The digesters are spaced 150.0 ft. apart in the East-West direction. All digesters are 32.8 ft tall without including the dome height and have inside diameters of 110.0 ft. All digesters are reinforced concrete with a combination of mild steel bars and prestressing wires.

The purpose of the site visit was to give SAWS initial recommendations for life safety and a path forward for structural repairs and rehabilitation due to a sludge overflow event that caused the digester dome to be shifted out of its position.

Observations:

Mixer Platform and Pipe:

The mixer platform moved away from the prestressed composite core wall horizontally and vertically (Figure 1) and tilted slightly (Figure 2) due to the overflow. The pipe that is connected to the motor at the top of the mixer platform was damaged due to the vertical movement of the digester dome. Some damage was observed at the outside cover of the mixer draft tube. It was not clear if this damage was due to the overflow, or the pressure built up due to the overflow. A few of the steel angles that were supporting the platform were detached from the ring around the mixer draft tube (Figure 3). A steel hollow section was observed under the mixer platform, which was completely detached. Some of the pipes under the mixer platform appeared to be damaged and detached (Figure 3).

Transfer Box:

The transfer box is attached to both the dome and the prestressed composite core wall. When the pressure from the overflow lifted the dome, the concrete box split into two pieces vertically and moved away from the prestressed composite core wall horizontally and vertically (Figure 4). The gap between the two pieces varies from a hairline, to 12 in. vertically. Pipes and rebar within the box are currently exposed and appeared to be damaged. Bars are also exposed at the face of the box at two locations due to spalled concrete (Figure 5). The concrete spalls are 7 in. to 12 in long horizontally.

Concrete Dome:

The vertical gap between the concrete dome and the prestressed composite core wall varies from 0 in. to 12 in. (Figure 6). The horizontal distance from the outer face of the wall to the outer face of the dome is 8.5 in. (Figure 7). No dowels were observed between the dome and the wall (Figure 8). Moderate to severe concrete spalling was observed where the dome meets the wall (Figure 8).

Catwalk:

The catwalk connecting the first and second rows of digesters is currently lifted 2 in. at the connection attached to the Digester No. 6 due to the vertical movement of the digester dome (Figure 9).

Overall Safety Impression:

- 1) The contractor is responsible for the means and methods of construction and all job related safety standards such as OSHA (Occupational Safety and Health Administration) and DOSH (Department of Occupational Safety and Health) for the digester, cat walk, and any equipment attached to them.
- 2) Digester, cat walk, and any equipment attached to them should be used by personnel only if absolutely necessary.

Recommendations:

The following repairs, rehabilitation and safety measures are recommended:

- 1) All movement sensitive equipment, piping, electrical connections should be removed, and items stored as needed prior to commencing any structural work.
- 2) A specialized lifting/shoring company should be hired to shore/lift the concrete dome, repair the coped lid and tank rim, and place it back into it's original location.
- 3) The concrete between the prestressed core wall and the concrete dome should be repaired and sealed.
- 4) All damaged steel angles supporting the mixer platform that have been broken or damaged should be replaced.
- 5) No damage was visible at the Catwalk connections. However, the lifting/shoring contractor should evaluate the conditions, shore the catwalk as needed, and release the existing connections if necessary prior to lifting the lid. After dome/tank repairs are made and the lid is placed to it's original location, the catwalk connections should be repaired/replaced.

SITE VISIT PHOTOS



Figure 1



Figure 2



Figure 3



Figure 4



Figure 5



Figure 6



Figure 7



Figure 8



Figure 9