Subject: Mechanical Associates- Case Study: Shackleford Sewer Crossing September 21, 2015
Attn: To whom it may concern

Topic: Shackelford Sewer Crossing (Bulkhead Gates)

Mechanical Associates was approached by O'Dell Engineering, City of Modesto, and Mozingo Construction, Inc. to fabricate bulkhead gates per the proposed engineered design for the Shackelford Sewer Crossing project for the City of Modesto. After meeting with several other manufacturers, The City of Modesto was not impressed by what the other competitors were offering as an "approved equal" solution for this project. Even though Mechanical Associates was not a listed vendor for the project, Mechanical Associates believed the project could be accomplished in the manner it was designed and took the opportunity to lend a helping hand.

With very few conversations between Mechanical Associates, O'Dell Engineering and the City of Modesto to clear up questions, Mechanical Associates submitted the 36" x 36" bulkhead gate's drawings for approval. The project had some complexity to it due to the frame heights and their extensions to meet the head wall heights, head pressures requirements (25 Ft of on and off seating pressures), and the interchangeability of the slides(Discs) between each of the individual frames.

The project's gates needed to be suitable for raw sewage water contact, Mechanical Associates used 316 stainless steel materials in the manufacturing process. Having a total of six (6) 36" x 36" bulk head gates, each of the gate's slides (Discs) were a sealed unit design. The gate's slides (Discs) had the sealing system mechanically attached to them and had to be interchangeable with the other remaining frames. The slide's seals consisted of ¼" UHMW-PE retainer strips that held the EPDM J-bulb seal against all four sides of the slide (Discs). The weights of the slides also played a factor in the design; this was due to the slides possibly floating up after being placed in the frames and pushed under water to the desired depth. Mechanical Associates overcame this issue by incorporating weep holes in the slides (Discs); this would allow water to enter the internal portion of the slide (Discs) to add the extra weight needed and allowed the excess air to escape.

Mechanical Associates designed a lifting mechanism as well; to engage the slides (Discs) to lift and disengage the slide when fully closed or when needed to be opened. Mechanical Associates accomplished the slide lifter by adapting the same practices that the slides (Discs) were designed with. The lifter needed to fit inside the frame for clearance issues, the frames had flared to reduce the amount of space taken up. The lifter had mechanically attached 3/8" UHMW-PE strips to reduce the amount of play from front to back and side to side while sliding down the frame. The lifter engaged the lifting lugs by a spring tension system.

After the manufacturing process was completed, the installation of the bulkhead gates went with ease and was a relief for Mozingo Construction, Inc. Mechanical Associates was involved in the installation process by helping answer the questions of what type of epoxy to be used (Vulkem 116), suppling the 5/8" x 13 ½" anchor bolts, and other questions from the field crew.

Mechanical Associates meet the requirements and needs of the City of Modesto while keeping under the estimated budget, Mechanical Associates was able to keep Mozingo Construction, Inc. on schedule without acquiring any damages, and produced a product that meets the design requirements of O'Dell Engineering.

For further questions regarding this project or any other projects, please contact Mechanical Associates.