OBERMEYER GATED SPILLWAY S381
Jacksonville District 2005
General Information

- S381 is a 3 bay broad crested spillway structure equipped with Obermeyer gates that was completed in March 2005 for $5.5 million
- Designed as a water quality structure
- Purpose is to prevent urban runoff from communities west of Ft. Lauderdale from flowing west to water conservation areas
- 2,880 CFS discharge capacity
General Information (Cont.)

- Spillway is located along the C-11 Canal in Southeast Florida, west of Fort Lauderdale, Florida.
Background Information

- The original design called for a 2 bay vertical lift gated/ogee weir spillway structure in C-11 canal.
- Vertical lift gate structure was under construction.
Problems with Old Design

- Topography in area very flat, heavily developed
- Problems and concerns surfaced with the hydraulic design
- Local drainage districts upstream of the spillway realized that the 6” head differential created across structure meant more potential flooding than without project condition
- H&H design approach was for water quality - did not perform modeling of the watershed area to the east for flooding
Solution

• Decision made to abandon vertical lift gate design and redesign structure as an Obermeyer gated spillway (nearly zero head loss across structure)

• First time use for Jacksonville District

• Terminated existing construction contract

• Spillway was redesigned through an AE task order. HDR, Engineering Inc. did the new design and had previously designed one of these spillways in FL.

• NTP for construction contract was issued in October 03 and structure was completed in March 05.
In business since fall ’88
Corps Work:

1) McHenry – Illinois – Fall 2001 - Flood Control
2) Algonquin - Illinois – Fall 2001 - Flood Control
3) Lake Traverse – Minn. – Winter 2001- Reservoir outlet
4) Flint – Michigan – Fall 2000- Water Diversion
5) Clinton Weir – Michigan – Fall 96 – Diversion
6) Saylorville Lake- Iowa – Fall 93 – Flood Control
Obermeyer Gate Details

- Gates consist of two gate panels per bay supported by reinforced air bladders on the down stream side.
- Gates are raised and lowered by inflating or deflating the reinforced air bladders with compressed air.
- Gates are a bottom hinged system that are attached to the foundation with a row of anchors bolts.
- By controlling the air pressure in the bladders, the water elevations can be accurately maintained within the control range (full inflation to full deflation).
Obermeyer Gate Details (Cont.)

- Restraining straps keep gate from overturning in a reverse head condition.
- Lower O&M costs associated with Obermeyer gates compared with vertical lift gate spillways.
- Cleaner water discharge with Obermeyer gates verse vertical lift gate spillways since discharge is over the top instead of from the bottom.
- OHI provides design services (calculations, drawings, etc.) for the gates.
Sole Source Issue

- Sole source justification was required by Contracting Division in order to use Obermeyer gates.
- HDR performed up to 70% of design until sole source approval.
Braced Cofferdam

- Required construction of work platform and diversion channel
- Bottom of foundation approx 20’ below water surface
- Required blasting to get sheets through limestone
Tremie Seal

- 8’ thick concrete seal placed by tremie to allow construction in dry
- Rock anchors used to reduce thickness of tremie and to anchor spillway structure
Spillway Structure

- 101’-6” long X 48’-6” wide overall
- Exterior walls 2’-6” thick
- Interior walls 3’-3” thick
- Walls designed to allow dewatering of any bay
- Foundation 3’-0” to 4’-6” thick
- Integral flat slab bridge helps to brace walls
Design Criteria

• Structure designed to allow for dewatering of one bay at a time for maintenance
• Structure designed for a maximum water elevation of 5.00
• Designed for reverse head condition.
• Rock anchors designed for maximum overturning and sliding stability.
Construction Photos
• Local sponsor (SFWMD) requested SST gates and abutment plates to reduce future O&M costs
• Bid Schedule – Fixed cost bid item provided for Obermeyer services and equipment:
  Includes equipment
  Transporting equipment to site
  Providing on-site installation services
• Cost for 6 gates all OHI supplied material ~ $1,000,000
• OHI parts warranty – 2 years
Final Comments

1. Jacksonville’s H&H Branch has adopted these structures and proposed them on several future projects

2. Lower profile spillway structure that is mechanically much simpler due to no operating platform and may possibly save money

3. Use of this product successfully resolved a design dilemma for the Jacksonville District
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Video Presentation

Shows several of their installations

Benefits discussed include

– Drop gates without power (during floods)
– Gates can be independently operated
– Does not use hydraulic fluids
– Gates up to 10 meters tall
– Versatile, numerous applications