Building the Bridge Deck: Step-By-Step Guide to Casting Approach Span Segments

About 330 pre-cast segments get trucked from the on-site casting yard to these bridge areas.

About 650 pre-cast segments get barged to the river bridge from Grey Cloud Island casting yard in Cottage Grove.
• **Location:**
  Near Hwy 36/95 interchange in Oak Park Heights

• **Construction:**
  330 pre-cast concrete segments

• **Segment dimensions:**
  - 43 ft. wide
  - 10-14 ft. tall
  - 10 ft. deep
  - Up to 90 tons each

• **Timeline:**
  - Cast about 1 segment per day
  - Most segments installed in 2015
Linear casting sequence

- Segments are cast in the order crews will place them on the bridge.
- Each segment is one-of-a-kind, like a puzzle piece.
Step 1: Build the forms

- On-site casting yard has three sets of forms (casting beds)
- The adjustable forms create each segment’s unique shape and size
- Steel reinforcement bar and concrete placed inside the forms
Step 2: Construct rebar cage

• Crews build a steel reinforcement bar (rebar) cage inside the rebar jig

• Rebar acts like a skeleton in each segment
Step 3: Transport rebar cage to form

- Crews use a crane to lift and place the rebar cage inside the form
Step 4: Pour the concrete

- First, crews install hollow plastic ducts in both directions – this makes space for post-tensioned steel strands used when installing the segment on the bridge.

- Then, they pour concrete inside the form over the rebar and ducts.

- Surveyors measure before and after each pour--to the thousandth of a foot!
Step 5: Cure the concrete

- Concrete cures to meet a desired strength before crews remove the form – typically this takes about 15 hours.
- Next, the transverse post-tensioning strands are stressed.
Step 6: Create matching segments

- Crews move the finished segment to sit adjacent to the casting bed
- The finished segment becomes a template (end form) for the next segment to be complete
- This ensures that each segment matches perfectly with the next
Step 7: Move segment to storage area

- Crews transport the segments to a nearby storage area
- Here, the concrete continues to age and strengthen

Segment lifter moves the finished segments – can lift up to 100 tons