



Building the Bridge Deck:

Step-By-Step Guide to Casting Approach Span Segments

On-Site Casting Yard

- **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 take 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