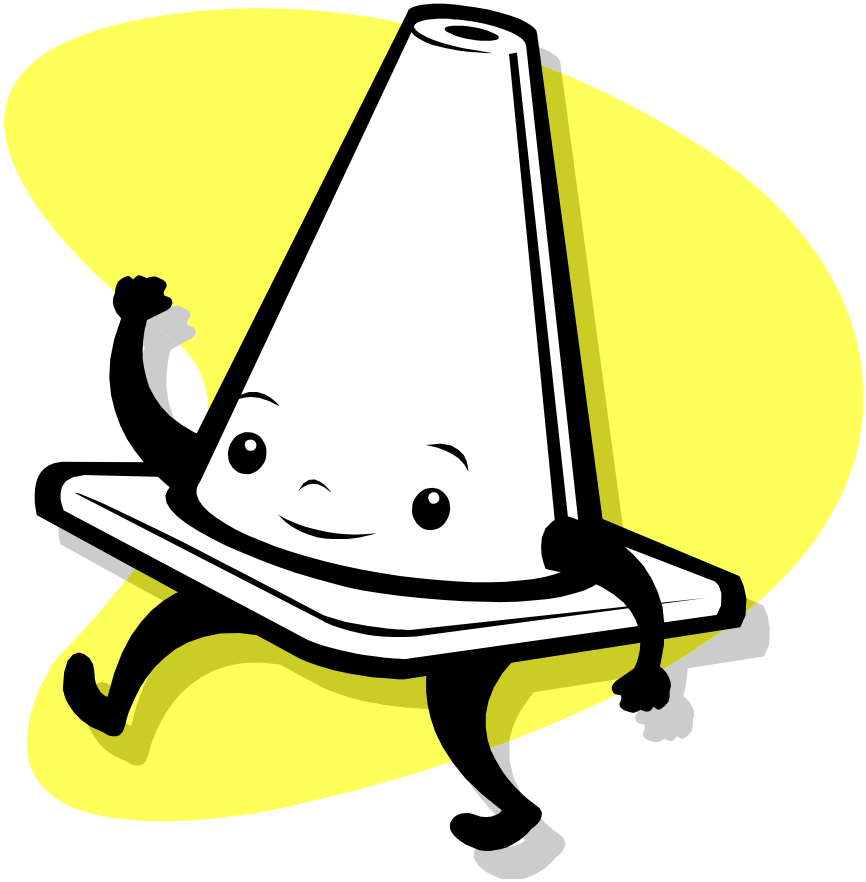
WHAT TO INSPECT WHEN YOU'RE INSPECTING…

Municipal Streets Seminar
November 13, 2025



WHY QA/QC?

- Catch “problems” before they become problems
  - Maintain consistency throughout the project
- Protect the contractor
- Protect the supplier
- Protect the owner

CATCHING PROBLEMS

- Does mix being placed meet project requirements?
- Are strength requirements being met before proceeding?

PROTECT THE CONTRACTOR

- Is the mix delivered to the job site the same as what's called for in the plans?
- Are they adhering to the project specifications?

PROTECT THE SUPPLIER

- Are they batching the correct mix design?
- Are the proportions right?
- Are they adhering to the project specifications?

PROTECT THE OWNER

- Are they getting what they're paying for?
- Can they trust the contractor and supplier?
- Verify the performance of the material

TYPICAL QA/QC ISSUES

- Individual project specifications
- Communication regarding schedule
  - Budget over-runs
- Communication regarding results

THINGS TO WATCH FOR…

- Appropriate credentials
- Appropriate methodology (test methods)
- Appropriate equipment
- Competency of tester

CHECK CREDENTIALS

- DOT Certifications – card?
- ACI Certifications – card?
- PCA Certifications – card?

CHECK METHODOLOGY

- Using appropriate method?
  - ASTM, IDOT, AASHTO?
  - SUDAS
- Sampling procedures
- Casting specimens
  - Beams vs. cylinders
  - Cylinder vs. cylinder
- Curing techniques

CHECK EQUIPMENT

- Recent calibrations
- Broken parts/pieces
- Clean, orderly

TYPICAL PCC TESTING REQUIREMENTS

- Air content of mix
- Water content of mix
- Temperature of mix
- Strength of mix

- Aggregate gradations

TYPICAL FIELD TESTS

- Slump test
- Air test
- Temperature test
- Cast strength specimens

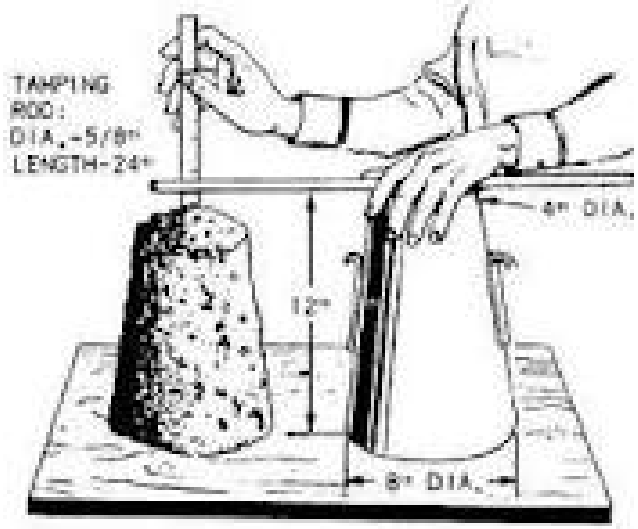
- Gradations (if applicable)

CRITICAL STEP - SAMPLING

- Sampling procedures
- Sampling point should be established prior to project start up or pour
- Issues with tester getting in the way
  - Slowing down project progress

SLUMP TEST

- Check equipment
  - Perpendicularity of cone / board
  - Straightedge / Tamping rod
- Check methodology
  - Secure base board
  - 3 lifts, tamped 25 times, strike off with straightedge
  - DO NOT TAMP WITH RUBBER MALLET!!!!
  - Time of release, not to exceed 5 +/-2sec.
  - Total test time, not to exceed 2 1/2 min.



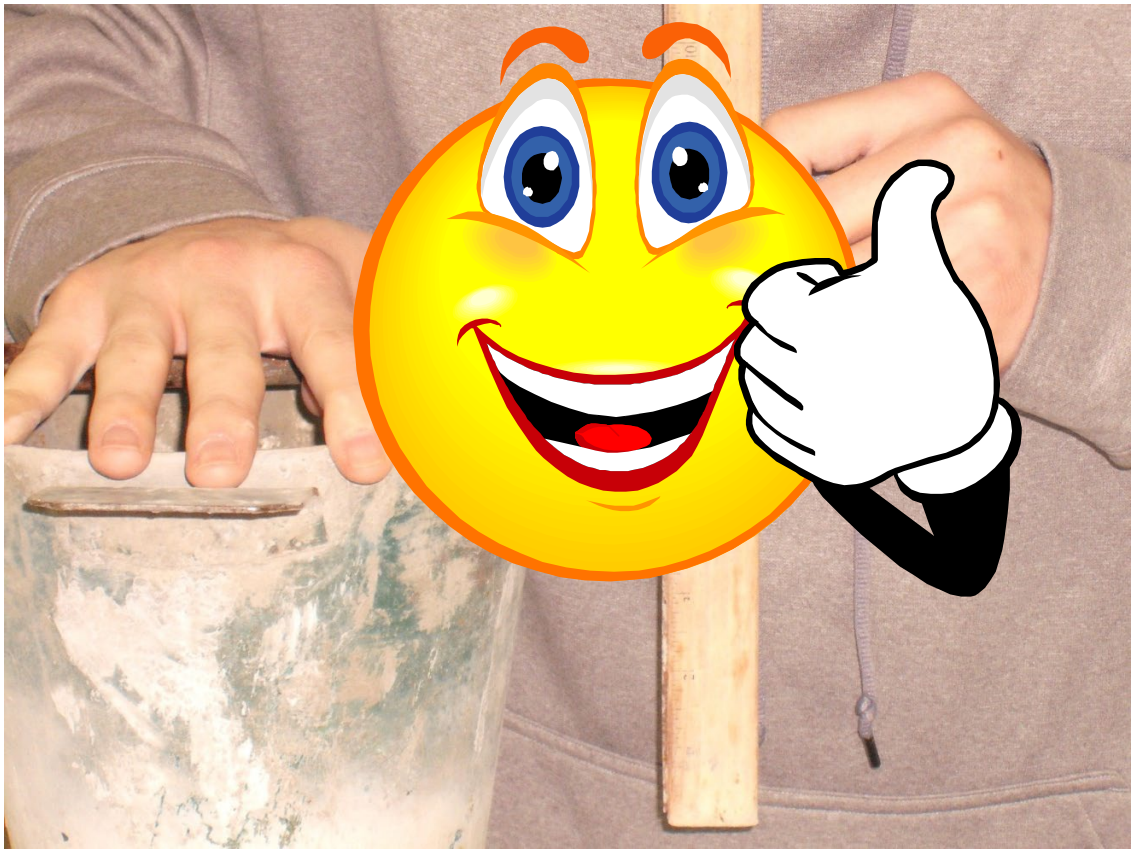
SLUMP TEST COMMON MISTAKES

- Tapping cone
- Point of measurement
- Base movement
- Slump board
- Performing on tailgate of truck

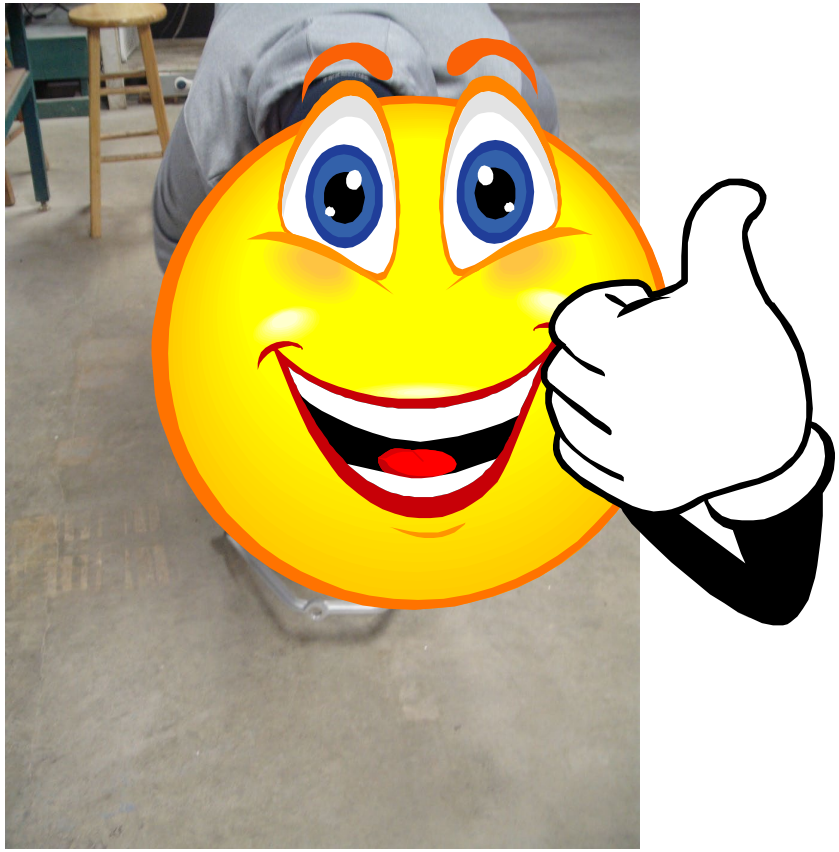
SLUMP TEST

SLUMP TEST

SLUMP TEST



SLUMP TEST



AIR TEST (PRESSURE METHOD)

- Check equipment
  - Valves function properly
  - Cleanliness of pot and lid
  - Straightedge
  - Rubber mallet
- Check methodology
  - 3 lifts, rod 25 times, tamp pot with mallet to consolidate
  - Strike off with straightedge, clean edge to make a good seal
  - Rap pot firmly with mallet, release pressure

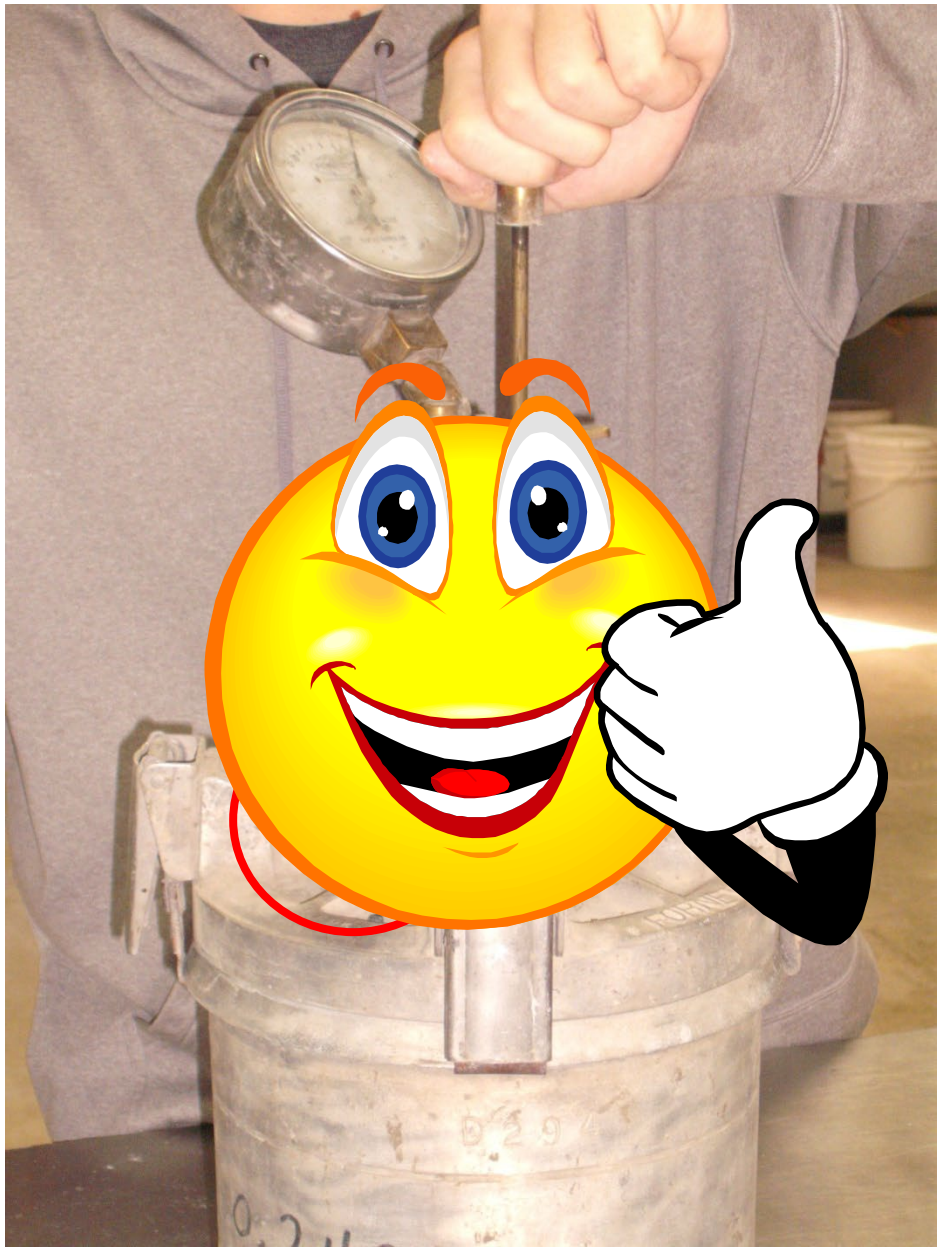
AIR METER COMMON MISTAKES

- Clean strike-off, good seal
- Rap firmly with mallet
- Pressure with pet cocks open
- Stabilize needle
- Tilt?
- Frequency of calibration!!!!

AIR TEST

AIR TEST

AIR TEST



AIR TEST

TEMPERATURE TEST

- Check equipment
  - Thermometer actually works…
  - Calibrated?
- Check methodology
  - Place thermometer in center of sampling container, not touching sides, embedded at least 3 inches in to sample.
  - Wait 2-5 minutes prior to taking reading, giving time to stabilize.

STRENGTH SPECIMENS CASTING BEAMS

- Check equipment
  - Beam molds – perpendicular, water tight, etc.
  - Tamping rod
  - Vibrator
- Check methodology
  - Placed in 2 lifts, rod each lift 25 times OR Placed in 1 lift, vibrate
  - Strike off and finish
  - Cover with burlap to cure
  - IDOT approves shovel usage, 2 lifts

TYPES OF BEAM MOLDS

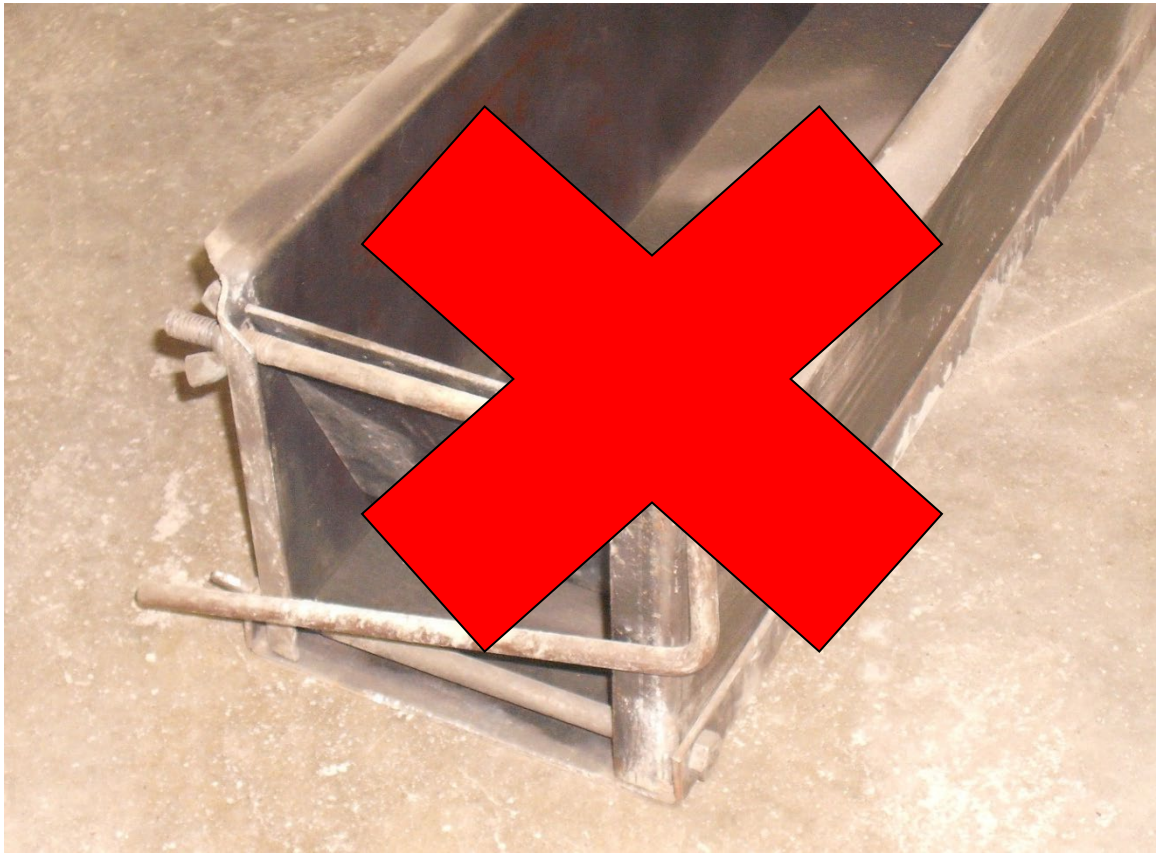
BEAM SPECIMEN COMMON MISTAKES

- Mold assembly
  - Not square
  - Ends on wrong side of bolts
- Appropriate consolidation method (rod, shovel or vibrator)
- Un-even strike off during finishing

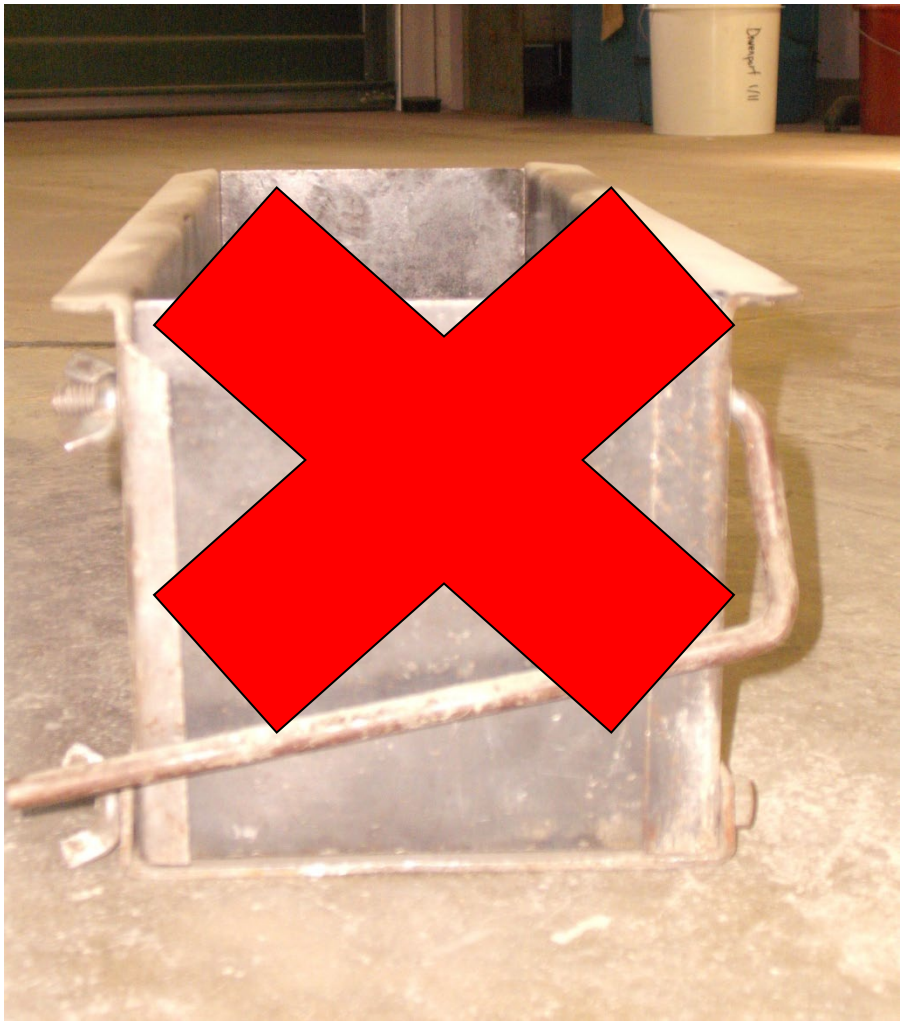
BEAM MOLDS

BEAM MOLDS

BEAM MOLDS



BEAM MOLDS



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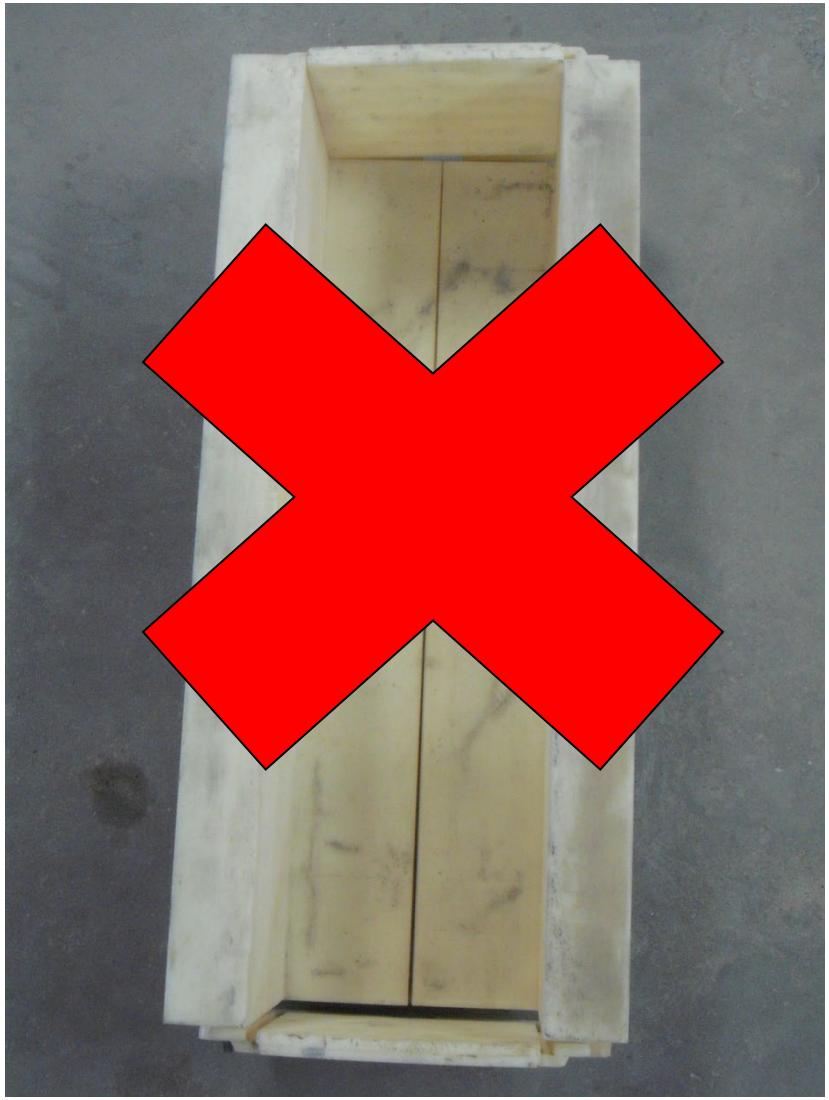

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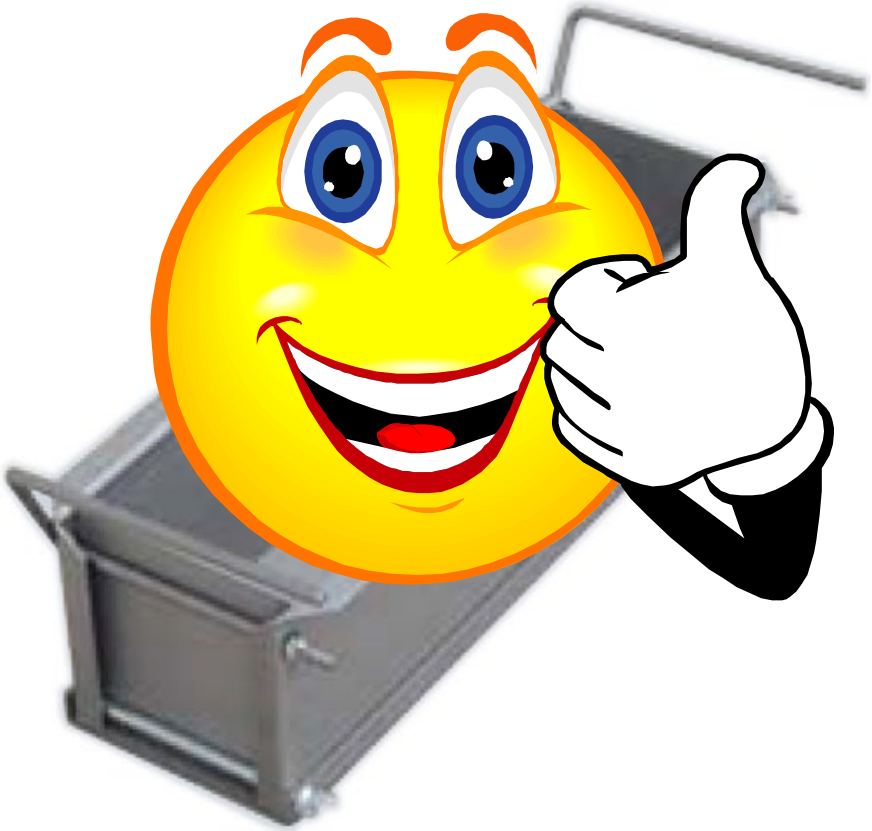

BEAM MOLDS

BEAM MOLDS

STRENGTH SPECIMENS CASTING CYLINDERS

- Check equipment
  - Cylinder molds and lids
  - Tamping rod
  - Strike-off bar
- Check methodology
  - 6 in molds – placed in 3 lifts, rod 25 times each lift
  - 4 in molds – placed in 2 lifts, rod 25 times each lift
  - Strike off and lid to cure
  - Appropriate tamping rod size

TYPES OF CYLINDER MOLDS

CYLINDER SPECIMEN COMMON MISTAKES

- Mold out of round
- Forgetting to rod (poor consolidation)
- Lids – not using them!
- Storage (elements)
- Storage not level
- Storage prone to disturbance

STRENGTH SPECIMEN ISSUES

- Pick-up time
- On-site storage - Curing
- Transportation
- Lab storage - Curing
- Testing machine

STRENGTH SPECIMEN ISSUES

- CURING
- Field vs. Lab
- ASTM C31 – states a “curing” temp for both situations

GRADATIONS

- IDOT plant inspection/monitor
- Moisture content
- Specific gravity/absorption
- Quantity verifications
- Adapting to new gradations
  - (1.5 inch NMAS)

ASTM STANDARDS

- C-172 – Sampling Freshly Mixed Concrete
- C-1064 – Temperature of Freshly Mixed Hydraulic-Cement Concrete
- C-231 – Air Content of Freshly Mixed Concrete by Pressure Method
- C-143 – Slump of Hydraulic-Cement Concrete
- C-31 – Making and Curing Concrete Test Specimens in the Field
- C-78/C-293 - Flexural Strength of Concrete (Third Point/Center Point)
- C-39 – Compressive Strength of Cylindrical Concrete Specimens

QUESTIONS?