Low Strength Concrete Procedures
Class A & AA Low Cylinder Investigation

- Low Break
  - Is Break More Than 500 psi Below Required Strength? [NO]
  - Is Average of Last 3 Breaks Below The Required Strength? [NO]
    - Test Report Marked "Does Not Meet – Accepted"
    - Time Line: 1 - Week
  - Is Break More Than 500 psi Below Required Strength? [YES]
    - Test Report Marked "Failure". Lab to notify RE, CT, BCE by Phone and Email
    - CT Investigates Batch Weights, Performs Windsor Probe, and Forwards to SFCE
    - Is Reading More Than 1000 psi Below Required Strength? [NO]
      - SCFE Completes Report and Recommendation.
      - BCE is Notified
      - Are Cores Required? [YES]
        - MOE Writes Letter With Recommendation
        - RE Notifies Contractor
        - BCE Writes Letter With Acceptance, Price Reduction or Removal
        - MOE Writes Letter With Recommendation
        - RE Notifies Contractor
      - BCE is Notified
      - Are Cores Required? [NO]
        - SCFE Removes Mix From Approved List
        - MOE Writes Letter With Recommendation
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    - Is Reading More Than 1000 psi Below Required Strength? [YES]
      - BCE is Notified
      - Are Cores Required? [YES]
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                                                  - BCE is Notified
                                                  - Are Cores Required? [NO]
Class B Low Cylinder Investigation

Is Break More Than 850 psi Below Required Strength?

Test Report Marked “Failure”. Lab to notify RE, CT, BCE by Phone and Email

CT Investigates Batch Weights, Performs Windsor Probe, and Forwards to SFCE

SCE Completes Report and Recommendation.

SCFE Removes Mix From Approved List

RE Notifies Contractor

BCE Writes Letter With Acceptance, Price Reduction or Removal

End

Time Line: 1 - Week

MOE - Materials Operations Engineer
FOE - Field Operations Engineer
SCFE - State Field Concrete Engineer
RE - Resident Engineer
CT - Concrete Technician
BCE - Bridge Construction Engineer
Low Strength Concrete Procedures: Precast Members

Low Break

M & T and Structure Design Determine if The Member Is Structurally Adequate

Is The Member Structurally Adequate?

YES

M & T Stamps the Member “Approved” and sends a NCR (non-conformance report) To the RE and BCE

BCE Writes Letter Accepting with a Price Reduction

NO

M & T Rejects The Member

End

RE Notifies Contractor Of Disposition and Makes Price Reduction
Calculation of Cost Reduction

Need to know: Required strength
           Cylinder strength
           Yards of concrete

Example:

\[
10 \times 120 \left[ 1 - \left( \frac{3800}{4500} \right)^2 \right] = 344.30
\]

Reduction due to strength
Investigative costs
Total reduction

Investigative costs
$1344.30

Notes:
1. Yards of concrete - the quantity of concrete used in the entire member being cast, even if you have other cylinders. Ex. drilled shaft (entire shaft), deck (entire deck), precast (all members in the bed)
2. Assumed cost of concrete - use $120/cy for all concrete
3. Cylinder break strength - use the 28 day cylinder strength, not swiss hammer, windsor probe or core strength
4. Specified strength for the class of concrete used
5. Investigative costs - these costs are applied to all price reductions. On cast-in-place concrete, they are $1000. For precast concrete, the investigative costs are $350.