

INTERAGENCY QUALITY ASSURANCE COMMITTEE (IQAC)

Material Qualification

Concrete Mix Designs

General



This procedure is to outline the current IQAC policy and procedure for qualification, and quality assurance sampling and testing of Portland Cement Concrete Mix Designs. Please note that final acceptance of materials will be based upon the material sampled in-place at the project site, per Section 106 of the Standard Specifications.



Each individual location or "plant" shall be referred to as a "source". The responsible party will be the governing agency nominated by the IQAC for each individual source. Please contact the governing agency, within whose boundaries the source is located, for information.

The following list of criteria is required for the year 2022 Submittal process for September 2023 until updated.

Qualification Procedure

Mix designs are to be updated and submitted every January 1st. Any mixes not resubmitted will be removed from the list January 31st of each year.

Mix Renewals

1. Complete "Concrete Mix Submittal Form" with attached supporting documentation. (Material certifications, admixture data sheets, compressive strength tests)
2. Include in the submittal the laboratory data including
 - a. Design: Plant name, date, (structural concrete only: exposure classification), Fly Ash replacement percentage, Sack of Cement/CY, w/c ratio, design weights per cubic yard, total weight of all materials batched sieve analysis of each bin, with combination for mix design, unit weight of batched design in lbs/cft, moisture correction for absorption of aggregates, fineness

Laboratory data shall be easily correlated with strength test results.

3. Submit source of materials and application (Bin/dosing) rates per cubic yards by measurement percentages of each volume, pounds, gallon/oz, and percent air entrainment for the concrete mix design.



4. Include maximum design slump, and slump range with anticipated admixtures.
5. Ready Mix supplier shall provide test results for ASTM C 1567 Mortar Bar expansion.
6. Must have an updated design with a Nevada P.E. stamp
7. Five random (5) production sets of 28-day break data from the **previous year**; the use of multi-lab P.E. review for statistics is acceptable if the cover letter is stamped, and the cylinder test data noted on the letter with data sheet back-up. The average of the strength tests shall meet or exceed the required average compressive strength as determined by ACI 301-16.
8. Renewals with less than Five (5) breaks will be considered as a new design and will have to be resubmitted following New Designs submittal procedures below.
9. Test results shall be performed by an accredited laboratory

New Designs

1. Includes Mix Renewal with the addition of:
2. Either Method A or Method B
 - a. A production batch with a minimum of Water-Cement curve and a minimum of five (5) production sets of 7,28-day break data.
 - b. Trial batch within sixty (60) days of the request.
 - i. Concrete batched in a laboratory shall be in accordance with ASTM C 192. The Engineer will test the trial batch and provide the Contractor with the results. The trial batch shall be of sufficient quantity to allow the Contractor and the Engineer to perform all required tests from the same batch using at minimum a 4-point curve for 7, 14, and 28-day strengths. 56-day if needed.
3. All break data must meet ACI 301.4.2.3.3.b average compressive strength requirement.

General

1. New or renewed mixes submitted 30 days prior to 1st business day of January will be allowed to continue for the following year and will not need to be resubmitted for the January renewal period.
2. All submittals need current (within 45 days) certifications for

admixtures, cement, and fly ash. C33 aggregate tests shall be current and have been performed within the previous 6 months.

3. Concrete aggregate testing per Section 704 "Concrete Aggregate", tests shall be submitted monthly to the responsible agency.
4. For active National Ready Mixed Concrete Association certified batch plants for stationary mixers.
 - a. Structural concrete materials must conform to ACI 301-16.
 - i. Submit Exposure Classification.
 - b. Each plant will require separate mix designs
5. Mobile Batch Plants shall adhere to the Volumetric Mixer Manufacturers Bureau manual VMMB 100-001 per CCUSS 501.03.06F
 - a. Provide the latest calibration certificate with mix submittals.
 - i. Calibrations shall be performed every 6-months at a minimum.
 - b. Certification status shall be once per year and submitted to the Responsible Agency.
 - c. Mix designs shall include model of mixer, truck number, and include serial number or equal.
 - d. Each batch truck will require a separate mix design.
6. All designs will require full compliance to the ACI 301 guidelines.
7. Shotcrete design shall meet or exceed specification in ACI 318-19.

Mix designs with incomplete or incorrect strength tests will be returned without further review of the mix design.