



**Arizona
Rock
Products
Association**

CERTIFICATION OF READY MIXED CONCRETE PRODUCTION FACILITIES

COMPANY	PLANT NO.
Plant Address or Physical Location	
Engineer	
Inspection Date	Expiration Date

Arizona Rock Products Association

916 W. Adams Street

Phoenix, Arizona 85007

Submit electronic copy of checklist to nicole@azrockproducts.org

Arizona Rock Products Association Certification of Ready Mixed Concrete Production Facilities

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Arizona Rock Products Association
Ready Mixed Concrete Plant Certification

Foreword

This certification program contains a check list for establishing that Ready Mixed Concrete production facilities are capable of producing quality concrete in accordance with applicable standards. Upon completion of a satisfactory inspection, a Certificate of Conformance that the plant has the capability of producing concrete will be issued.

The inspection must be conducted by a Registered Professional Engineer licensed in Arizona. The engineer must be certified as a Ready Mixed Concrete Plant Inspector by the National Ready Mixed Concrete Association. The engineer is required to sign and seal the inspection check list and Certification. The engineer must also include his NRMCA plant inspection ID number where indicated.

The checklist indicates only that plant facilities are satisfactory for the production of concrete when properly operated. Conformance of the concrete itself with specification requirements must be verified by usual inspection methods in accordance with sales agreements.

This certification program is accepted by Arizona Department of Transportation and Maricopa Association of Governments. This plant certification program is intended for ARPA members. For non ARPA members, certification of Ready Mix Plants can be provided through NRMCA (www.nrmca.org) and individual government agencies.

The plant inspection criteria meet or exceed that required by ASTM C 94/9M Standard Specifications for Ready Mixed Concrete, AASHTO M 157 and ACI 304R Guide for Measuring, Mixing Transporting and Placing Concrete.

Arizona Rock Products Association
916 West Adams Street
Phoenix, Arizona 85007
602-271-0346
Send electronic submittals to
nicole@azrockproducts.org



*Certificate of Conformance
for
Concrete Production Facilities*

It is hereby certified that

has been inspected by the undersigned registered professional engineer for conformance with requirements of the "Check List for Ready Mixed Concrete Production Facilities." As of the inspection date, the facilities met requirements as stated below.

Operation: **Truck Mixing and/or Central Mix**
Batching System: **Manual, Semi-Automated or Fully Automated**
Recording: **Cementitious, Aggregate, Water, Admixture**

Executive Director

Arizona Rock Products Association

Date signed by ARPA Executive Director

Inspection Date

Expiration Date



This Company will maintain these facilities in compliance with the Check List requirements and will correct promptly any deficiencies which develop.

Qualification of Inspecting Engineers and Assistants

Inspecting engineers and certified assistants must be certified by NRMCA as a qualified plant inspector. The engineer must be licensed in the state of the plant location. NRMCA will issue the Engineer an identification number which should be used where indicated (Engineer ID from NRMCA).

Information with respect to qualification as an NRMCA plant inspector can be obtained from:

National Ready Mixed Concrete Association
Engineering Division – Plant Certification
900 Spring Street
Silver Springs, Maryland 20910

Phone: 301-587-1400

Email: nrmca@nrmca.org
www.nrmca.org

CONCRETE BATCH PLANT INSPECTION GUIDE

INSPECTION GUIDELINES & ITEMS TO IDENTIFY OR VERIFY

The following sections are intended to provide general guidelines for Engineers to reference when performing ARPA batch plant inspections. This guideline should not be considered to be exhaustive, but to provide an indication of the program's intent, which is to determine if a plant is capable of producing quality concrete. The numbering and identification in this guide are consistent with the accompanying concrete Batch Plant Inspection Report in Section 11 of this document for ease of use.

MATERIALS/INGREDIENTS

1. Aggregates
 - a. Aggregate Storage & Handling
 - i. Individual stockpiles for each aggregate.
 - ii. Stockpiles are separated sufficiently that material removed to feed plant is not subject to contamination from adjacent products.
 - iii. No evidence of significant contamination, oversize material, or segregation in stockpiles.
 - iv. Method(s) exists to ensure correct aggregate(s) are fed to plant bins.
 - v. Means of tracking when plant bins are running low or empty.
 - b. Aggregate Quality & Consistency
 - i. Test data available to indicate gradation, sand equivalent, and moisture are being checked regularly. Data can be from internal Quality Control (QC) program, testing performed for supplier by outside laboratory, or testing performed for materials by Agency or Owner, etc.
 - ii. Policy (formal or informal) has been established to address material which is unacceptable.
2. Cementitious Materials
 - a. Storage
 - i. Separate storage for cement and fly ash.
 - ii. Separate storage for cement or fly ash from different supplier or source.
 - iii. No visual evidence of leakage; i.e. no piles of material around silos, storage, transfer points, etc.
 - b. Supply/Source
 - i. Supplier and source of cement.
 - ii. Supplier and source of fly ash.
 - iii. Are there multiple suppliers of these products for the specific plant?

3. Admixtures/Additives

a. Admixture Bulk Storage and Handling

- i. Are admixtures in individual containers, protected from damage by equipment, vehicles, or weather?
- ii. When admixtures are identified as unstable or prone to separation/settlement, is agitation of the ingredients provided?
- iii. When admixtures are subject to freezing, is some form of protection (heating, inside building, etc.) provided?

b. Additive Storage and Handling

- i. What other additives are utilized at the plant (fibers, color, etc.)?
- ii. Are these materials kept separate and protected?
- iii. How are additives measured and introduced into the concrete?

c. Supply/Source

- i. Supplier and source of admixtures.
- ii. Supplier and source of any other additives.
- iii. Are there multiple suppliers of these products for the specific plant?

4. Water

a. Source/Supply

- i. What is the water source (city water, well, canal, etc.)?
- ii. How is adequate water supply and/or pressure ensured (storage tank(s), pumps, etc.)?
- iii. Are water storage containers insulated and/or protected?

b. Heating and Chilling (Optional items; not required for plant certification)

- i. Are there means of heating water for use in concrete available? If so, what type of unit is it (propane heater, natural gas heater, heat pump, etc.)?
- ii. Are there means of chilling water for use in concrete available? If so, what type of unit is it (refrigeration unit, condenser unit, heat pump, etc.)?
- iii. Is insulated storage available for heated or chilled water?

BATCHING PLANT

5. Scales, Plant Bins, and Weigh Batchers

a. Scale Type

- i. Note whether scale is beam indicating, dial-indicating, or digital-indicating.
- ii. Note Manufacturer and Model Number of scale or scale system (if applicable).

- b. Is scale visible to batchman at normal station as referenced in *ASTM C 94 Standard Specifications for Ready Mixed Concrete*?
 - i. Note whether scale is **clearly** visible to batchman, and if there are any obstructions to line of sight.
 - ii. Note whether there is an intervening window or if remote video transmission is used.
- c. Are scales/batchers accurate within applicable tolerances?
 - i. Verify batch weights for specific materials used in a specific load or batch of concrete using either:
 - 1. Visual observation of actual weights of ingredients used during actual batching operations.
 - 2. Review of batch information from plant recording system (see Section 9 below) for previously completed loads or batches of concrete.
 - ii. Compare actual batch weights to target batch weights for each ingredient to be checked.
 - iii. Calculate percent deviation between targeted weight and actual weight for each ingredient and verify that actual weights are within allowable tolerances (see Note 3 on checklist).
- d. Have scales been calibrated within last 6 months?
 - i. Calibration by state approved, independent scale company is acceptable. Verify date of certification using either sticker on scales or signed and printed paperwork from Scale Company.
 - ii. Physical scale verification in inspector's presence using calibrated weights is also acceptable. Note calibrating agency used to verify accuracy of weights as well as Serial Number or ID of individual weights used.
 - iii. Verify that there are separate calibrations for aggregate scale and cementitious scale.
- e. Separate bins for fine aggregate and each size of coarse aggregate.
 - i. Identify total number of aggregate bins.
 - ii. Identify aggregates typically used in bins.
- f. Separate scale and weigh hopper for cementitious materials.
 - i. Verify separate scale using physical scale display or computerized display.
 - ii. Both cement and fly ash can be weighed on same scale.
- g. All weigh hoppers are freely suspended from scale and charge and discharge properly.

- i. Verify that weigh hoppers are freely suspended by observing batching operations from start of process. Make sure weight is incremented smoothly and that no obvious kinks or hang-ups occur.
 - ii. Verify charging and discharging by observing batching and loading operations from start of process through finish. Make sure that scale indicators begin and end at a nominal reading of zero.
- h. Free moisture in aggregates taken into consideration when determining batch weights.
 - i. Moisture of coarse and, especially fine aggregate must be accounted for in determining batch weights.
 - ii. Moisture can be determined using samples which are weighed, dried, weighed again, and the moisture percent calculated.
 - iii. Moisture of fine aggregate can be determined using a moisture probe in sand bin or discharge. This should be periodically correlated to weighed and dried moisture samples.
 - iv. Moisture of fine aggregate can be determined using a Speedy moisture tester if correlated to weighed and dried moisture samples.
 - v. Moisture can be accounted for in batching process either through computerized system or manually.

6. Water Meter, Water Batcher, Volumetric Measuring Tank

- a. Device for measurement of added water capable of delivering required quantity within applicable tolerances and capable of dispensing in increments as small as one gallon (10lb. if weighted).
 - i. Verify batch weight or volume of water used in a specific load or batch of concrete is within tolerance using either:
 - 1. Visual observation of actual batching process.
 - 2. Review of batch information from plant recording system (see Section 9 below) for previously completed loads or batches of concrete.
 - ii. Determine if water is added to batch via water meter, physical weighing, or volumetrically.
- b. Volumetric measuring equipped with a means to check calibration.
 - i. Tank has outside taps and valves to provide for checking calibration.
 - ii. Other means are provided for readily and accurately determining the amount of water in the tank.

7. Admixture Dispensers

- a. Separate dispenser for each admixture.
- b. Piping free of leaks and properly valved.
 - i. Inspect dispenser area to ensure that there are no obvious leaks.
 - ii. During batching operations, look for any evidence of malfunctioning dispensers.
- c. Have admixture dispensers been calibrated or verified within the last 6 months?
 - i. Dispensers can be calibrated/verified by admixture supplier. Ask concrete company for copy of report.
 - ii. Dispensers can be calibrated/verified by concrete company personnel using volumetric container(s) or weight checks. Ask to see record of most recent check.
- d. Visual or gross check for batchman independent of operation of primary metering device.
 - i. Visual system will usually consist of sight glass tube or clear dispenser with graduations allowing rough determination of admixture measured for batch.
 - ii. Must be either directly visible to batchman or viewable via real-time video camera and display.

8. Batching System

- a. Determine batch system type using definitions listed on Page 2 of the inspection checklist.

9. Recording System (recording device which provides a permanent record of batch quantities for each batch of concrete produced.)

- a. Determine if recorder identifies type of ingredients used in each batch of concrete in following categories:
 - i. Cementitious material.
 - ii. Coarse and fine aggregate.
 - iii. Water.
 - iv. Individual admixtures.
- b. Determine if recorder is properly protected.
 - i. Physical printer or recording device could be located in batch building or office.
 - ii. Data could be stored electronically in batch computer or database system.

- c. Provide for identifying the particular batch with the corresponding delivery ticket.
 - i. Can be accomplished through corresponding ticket number or control number located on both the delivery ticket and batch record.
 - ii. Can be accomplished through matching multiple categories of load-specific, non-duplicated information such as truck number, time of batch, quantity batched, client, or project identification located on both the delivery ticket and batch record.
- d. Registers individual quantity of ingredients used in each batch of concrete.

TICKETING SYSTEM

10. Delivery Ticket Provides the Following Information

- a. Ready-Mix Concrete Company's Name
- b. Plant Number or Designation
- c. Ticket Serial Number
- d. Truck Number or Designation
- e. Purchaser Name
- f. Job Name and Location
- g. Specific Class or Designation of Concrete Mix
- h. Batch Size in Cubic Yards or Meters
- i. Date and Time When Batch was Loaded
- j. Type and Name of Specialty Admixture or Ingredient and Amount Batched
 - i. Would typically include items the client pays extra for.
 - ii. Some examples include:
 - 1. Chilled or Hot Water
 - 2. Accelerator
 - 3. Fibers
 - 4. Color
 - 5. Retarder
- k. A place where extra water added at request of receiver of the concrete can be recorded with his signature or initials.

11. CONCRETE BATCH PLANT INSPECTION REPORT

Ready Mix Supplier: _____ Date: _____
 Plant number: _____ Project Name: _____
 Plant Location: _____ Project Number: _____
 Inspector: _____ Lab Number: _____

Directions for the inspector: Place an "x" in the applicable box.

<u>MATERIALS/INGREDIENTS</u>	<u>ACCEPTABLE</u>	NOT <u>ACCEPTABLE</u>	NOT <u>APPLICABLE</u>
1. Aggregates			
a. Aggregates transported, separated, stored, stockpiled, and fed to plant correctly (Note 1).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Aggregates meet applicable quality requirements (Note 1).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Cementitious Materials			
a. Silos are watertight without excessive leakage. Separate storage for cement and flyash.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Admixtures/Additives			
a. Admixtures protected to prevent damage from contamination and separation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Admixtures protected from freezing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Water			
a. Adequate supply and pressure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Adequate heating and/or chilling capacity (Note 2).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

BATCHING PLANT

5. Scales, Plant Bins, and Weigh Batches

- | | | | |
|--|--------------------------|--------------------------|--------------------------|
| a. Scale Type: Beam-indicating <input type="checkbox"/> Dial-indicating <input type="checkbox"/> Digital-indicating <input type="checkbox"/> | | | |
| b. Scale display(s) visible to batchman at normal station. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Scales/batchers accurate within applicable tolerances (Note 3). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d. Scales calibrated within last 6 months. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e. Separate bins for fine aggregate and each applicable size of coarse aggregate. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f. Separate scale and weigh hopper for cementitious materials. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g. All weigh hoppers freely suspended from scale and charge and discharge properly. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| h. Free moisture in aggregates taken into consideration when determining batch weights. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

6. Water Meter, Water Batcher, or Volumetric Measuring Tank

- | | | | |
|---|--------------------------|--------------------------|--------------------------|
| a. Device for measurement of added water capable of delivering required quantity within applicable tolerances and capable of dispensing in increments as small as one gallon (10lbs. if weighed). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Volumetric measuring tank equipped with a means to check calibration. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

7. Admixture Dispensers

- a. Separate dispenser for each admixture.
- b. Piping free of leaks and properly valved.
- c. Dispensers calibrated within last 6 months.
- d. Visual or gross check for batchman independent of operation of primary metering device.

8. Batching System *See definitions below.

- a. Batch System Type: Manual Semi -Automated Fully Automated

9. Recording System (recording device which provides a permanent record of batch quantities for each batch of concrete produced.)

- a. Recorders: Cementitious Aggregate Water Admixtures
 Recorders shall:
 - b. Be properly protected.
 - c. Provide for identifying the particular batch with the corresponding delivery ticket.
 - d. Register quantity of ingredients batched.

TICKETING SYSTEM

10. Delivery ticket provides the following information

	Not	Not	
	<u>ACCEPTABLE</u>	<u>ACCEPTABLE</u>	<u>APPLICABLE</u>
a. Ready-Mix Concrete Company's Name	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Plant number or designation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Ticket Serial Number	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Truck Number or designation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Purchaser Name	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Job name and location	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Specific class or designation of concrete mix	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Batch size in cubic yard or meters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Date and time when batch was loaded	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Type and name of specialty admixture or ingredient and amount batched	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. Place where extra water added at request of receiver of the concrete and his signature or initials.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The referenced plant satisfies the indicated criteria and is capable of producing acceptable concrete. Yes No

Notes:

1. Items 1a and 1b evaluated as follows: Aggregate stockpiles located to prevent contamination and arranged to assure that each aggregate as removed from its stockpile is distinct and not intermingled with others. Separate storage bins or compartments for each size and type of aggregate properly constructed and charges to prevent mixing of different sizes or types. Aggregates meet applicable specifications.
2. For information only; this item not required for approval of plant.
3. Applicable tolerances are consistent with information contained in the latest edition of *ASTM C 94 Standard Specifications for Ready Mixed Concrete*.

Definitions:

Manual Systems - Batching devices are operated manually. Individual batch target weights, moisture adjustments, and volumetric measuring systems are manually determined and verified by the batch operator. Discharge of the batch is performed manually by the batch operator. These systems are typically assisted by pneumatic, electric or hydraulic power, but may be hand operated.

Semi-Automated Systems - These systems provide mechanisms that start the weighing and volumetric measuring devices for the batch. These systems will stop the weighing and measuring upon attaining the required batch tolerances. Discharge of the batch may be automated upon attaining acceptable batch tolerances, or may be performed manually. These systems may or may not include interlocking mechanisms for out of tolerance batches.

Fully Automated Systems - A single starting mechanism provides target weights and volumes, begins the weighing and measuring process and ends this process when the targeted batch proportions are within tolerance. Out of tolerance batches must be manually adjusted to within tolerance and/or accepted by the batch operator. Once the batch tolerances are met or manually accepted, discharge of the batch will begin automatically.

11. Verification of Inspection and Application for Certification

This inspection was performed to evaluate the ability of the production facilities and the delivery trucks to produce and transport acceptable ready mix concrete. The criteria used for this evaluation was drawn from a number of sources including the guidelines presented in ASTM C 94, technical information presented by the Concrete Plant Manufacturers Bureau, and customary industry and/or agency practice. The specific items evaluated for both the plant and trucks are detailed in the accompanying checklists.

Based on the identified criteria, the inspection of the above referenced plant and trucks indicate that they have the capability of producing and transporting satisfactory ready mix concrete when operated according to the manufacturer's recommendations and standard industry practice. We would recommend that the plant be approved for use on Arizona Department of Transportation projects as well as those administered by other agencies or entities for a two year period from date of inspection, while the acceptable trucks should be approved for a period of one year from date of inspection.

12. Verification of Inspection and Application for Certification (CONTINUED)

The undersigned, a registered professional engineer in _____
 (state, territory, or jurisdiction)

has conducted the inspection of the ready-mixed concrete plant described as _____

 (please print specific designation and location of plant)

and asserts, in his professional judgment, the information provided on this Check List is accurate and complete. Application is hereby made for the issuance of a certificate for this plant, to be classified as follows:

<u>General Operation</u>	<u>Batching System</u>	<u>Recording (if any)</u>
<input type="checkbox"/> Truck Mixing	<input type="checkbox"/> Manual	<input type="checkbox"/> Cementitious
<input type="checkbox"/> Central Mixing	<input type="checkbox"/> Semi-Automated	<input type="checkbox"/> Aggregate
<input type="checkbox"/> Both	<input type="checkbox"/> Fully Automated	<input type="checkbox"/> Water
		<input type="checkbox"/> Admixtures

A Certificate of Conformance cannot be issued if any of the not acceptable boxes from **CONCRETE BATCH PLANT INSPECTION REPORT (pg 12 & 13)** are marked with an "X".

 (date)

 (signature of engineer)

 (NRMCA ID number)

 (name, please print)

 (date)

 (signature of engineer's assistant)

 (Asst. to the Engineer
 NRMCA ID number)

 (name, please print)

(Engineer's Seal)

 (business address, please print)

 (zip code)

 (phone number)

13. Agreement to Regularly Check Scales and Volumetric Batching Devices and Dispensers

The owner/operator of the plant described in this inspection agrees that all scales in the plant will be calibrated to required tolerances per (ASTM C 94 Standard Specifications for Ready-Mixed Concrete) at intervals not exceeding 6 months. The owner/operator also agrees that the batching accuracy of all volumetric admixture dispensers and all volumetric water batching devices (including water meters) will be checked at intervals not exceeding 90 days for conformance with batching accuracy requirements per (ASTM C 94 Standard Specification for Ready-Mixed Concrete). Any failure to meet the required batching accuracy requirements will be corrected promptly. Scales and volumetric batching devices shall be calibrated when the plant is moved or relocated.

14. References

1. Book of ASTM Standards, Volume 04.02, Concrete and Mineral Aggregates, C 94 Standard Specification for Ready- Mixed Concrete ASTM, 1916 Race Street, Philadelphia, PA 19103.
2. Concrete Plant Standards, Ninth Revision, January, 1990, Concrete Plant Manufacturers Bureau, 900 Spring Street, Silver Spring, Maryland 20910.
3. Truck Mixer and Agitator Standards. 17th Revision, March 12, 2005 Truck Mixer Manufacturers Bureau, 900 Spring Street, Silver Spring, Maryland 20910.
4. Guide for Measuring, Mixing, Transporting, and Placing Concrete (ACI 304R-00). American Concrete Institute, P.O. Box 19150, Redford Station Detroit, Michigan 48219.
5. Certification of Ready Mixed Concrete Production facilities, NRMCA , 900 Spring Street, Silver Spring, Maryland 20910