

Manitoba Ready Mix Concrete Association
www.mrmca.com

Ready Mix Concrete Production Facilities
Audit Check List
(Approved February 04, 2011)

Company		
Contact		
Phone	Fax	Email
Mailing Address		
Plant Location		
Auditor		
Audit Date		
Expiry Date		



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Foreword

MRMCA Certification Policies

The Manitoba Ready Mix Concrete Association (MRMCA), the representative organization of ready mix concrete producers in Manitoba, provides industry representation for the advancement of quality concrete in the province of Manitoba while striving towards the following goals:

- Market and promote the use of quality concrete
- Provide a consolidated industry approach to regulatory bodies
- Provide networking opportunities
- Provide education and training
- Promote best environmental and safety management practises

As a member of the Canadian Ready Mix Concrete Association, the MRMCA performs several important functions for its members, one being the certification of production plants. This Audit Check List outlines technical information about ready mix concrete plant facilities to assist producer members in building and maintaining plant equipment to the highest possible level of efficiency and safety.

In order for MRMCA producer members to provide assurance to their customers that a given production plant does have the capability of producing quality concrete by virtue of good equipment in proper operating condition, the MRMCA issues a Certificate of Conformance following a detailed audit of the plant's equipment as outlined in this Guide.

This publication sets out the detailed requirements for plant certification. This plant certification program does not address or document the quality of the concrete produced by a member company's plant. It provides an MRMCA member company with the means of obtaining a Certificate indicating that a plant, because of the nature and condition of its equipment, has the proper capability of producing quality concrete.

Certification is mandatory for all Producer Members of the MRMCA. For a company to be a Producer Member of the MRMCA, all of its concrete plants and equipment must conform to this guideline and have a current Certificate of Conformance as issued by the MRMCA. To be eligible for a Certificate of Conformance, the plant must be inspected by, or have the inspection supervised by, a professional engineer registered to practice within the Province of Manitoba and approved by the MRMCA, for conformance with the Check List requirements contained herein.

The cost for a certification application is based on a flat fee as determined by the Association and may change without notice at the beginning of a new calendar year. The flat fee comprises all administrative costs and plant audit. This fee is fixed and does not change regardless of location of the applicant within the province of Manitoba. However if the initial plant inspection visit reveals deficiencies, the producer member shall have the opportunity to provide documented proof that the deficiencies have been corrected to avoid a second visit. Until proof is submitted, certification is withheld. If a second visit is required, then mileage will be assessed at \$0.52/km plus all other expenses and the rate of \$75/hour will be assessed. All deficiencies are to be completed in 30 days from the initial visit.

In addition to carrying the signature and seal of the MRMCA's inspecting engineer, the Certificate must be signed by the principal company executive attesting to his/her intention of seeing that all equipment is maintained within the requirements of the Check List.

It should be noted in this connection that the inspecting engineer, in signing the Certificate, stakes his professional reputation on the evaluation having been objective and thorough. In addition, the engineer accepts his/her ethical and legal responsibilities not to disclose any information concerning the lawful business affairs or technical processes of Members.

At any time, the MRMCA reserves the right to perform a spot inspection to compare plant attributes with the most recent inspection Check List to satisfy itself that the Certificate provides a valid evidence of productive capability. The same prerogative exists with regard to the company's official pledge to maintain the equipment properly.

Currently Certification applications must be received at the Association on or before May 31st of each year. The Certification Committee will review these applications by mid June and make recommendations on each application to the Board of Directors.

The MRMCA allows for expedited Plant Certification upon request by the applicant company. The expedited process will take 2 weeks from receipt of a properly completed certification application. A non-refundable fee set by the Board of Directors must accompany the application for the expedited plant certification process. The non-refundable fee does not guarantee that the applicant's certification will be granted, but only that the application will be reviewed on a timely basis to determine its merits. Copies of this booklet are available without charge from the MRMCA or may be downloaded in PDF format from www.mrmca.com.

DISCLAIMER

The *Plant Certification Audit and Checklist* is intended to be used by the Manitoba Ready Mix Concrete Association (MRMCA) for the purpose of an on-site audit by a professional engineer prior to issuance of the Certificate.

Neither the MRMCA, its employees, board members or agents have made or hereby purport to make any representations, warranties, or covenants with respect to the specifications or information contained in this Check List or the results generated by their use, nor will they be liable for any damage, loss or claims, including those of an incidental or consequential nature, arising out of these protocols.

These protocols are not in any way intended to supersede or detract from any requirements contained in municipal, provincial or federal laws, regulations or legislation.

APPROVED QUALITY PROGRAM

The Manitoba Ready Mix Concrete Association (MRMCA) assists the provincial concrete industry by providing a Plant Certification program designed to assure owners and others that each Certified Production facility meets industry standards. Plant Certification is a mandatory requirement of all MRMCA producer member companies.

Each production facility is audited by a qualified professional engineer in order to ensure that the plant, equipment, material handling and delivery/mixer trucks have met the minimum prescribed qualifications and that the proper capability of producing quality concrete exists as per current edition of Canadian Standards Association (CSA) A23.1– Concrete Materials and Methods of Concrete Construction.

AUDIT and CHECK LIST

MRMCA offers this “Audit and Check List” prepared under the direction of the Association’s Technical Committee.

Under the Terms and Conditions of this Certification, all concrete production facilities of the producer member must at all times qualify for and hold a *Certificate of Ready Mix / Mobile Mix Concrete Production Facilities*. It is also a condition that the producer member allows MRMCA to conduct audits of the plant by an MRMCA appointed auditor at any time.

The “*Certificate of Concrete Production Facilities*” (hereafter referred to as the “*Certificate*”) is widely recognized by municipal, provincial and private specifying agencies. It is extensively used as a basis of concrete supplier pre-qualification as the supplier has demonstrated the ability to produce concrete in a manner consistent with this *Audit and Check List*.

INSTRUCTIONS for AUDIT and CHECK LIST

1 GENERAL

This section provides guidance to ready mixed concrete producers in qualifying their plants for the *Audit and Check List*. It is also intended to assist the examining Auditor in performing the plant inspection accurately. The Producer’s plant staff should assist the Auditor to expedite the inspections and to correct any deficiencies in plant installations or operations. The plant must be operating in order to complete the Audit.

In order to apply for or retain the plant certification, a ready mixed concrete producer will be supplied with a copy of this *Audit and Check List* for each plant to be inspected. The completed original document will be retained on file at the administrator’s (MRMCA) office.

A qualified registered Professional Engineer in the Province of Manitoba, here after known as “The Auditor”, appointed by MRMCA will inspect, or supervise the inspection of, all facilities covered by the *Audit and Check List* and attach his/her seal to the completed form.

A *Certificate* will be issued by the administrator (MRMCA) upon receipt of a properly executed *Audit and Check List* indication that the Audit requirements have been accepted, provided that all other conditions of certification have been met.

The *Audit and Check List* itemizes requirements for plant facilities and equipment used in the production of ready mix concrete. Each item is to be checked by the Auditor, meeting the requirements listed above who will in each case enter the appropriate symbol in the space provided as follows:

- a. “**P**” - If the requirement passes
- b. “**F**” - if the requirement fails
- c. “**NA**” - If the requirement is not applicable to the type of plant being inspected

The Auditor will examine every item on the *Audit and Check List* for conformance and indicate the appropriate symbol in the space provided. A *Certificate* cannot be issued to a plant that does not meet all applicable items in the *Audit and Check List*.

Once the Auditor has completed the *Audit and Check List*, he/she must initial the bottom right corner of every page of the booklet to confirm that all applicable sections have been reviewed and that the information is correct.

To validate the Owner's Conformance Agreement, the producer company executive must sign the agreement, attesting that he/she will maintain the facilities in compliance with the Audit requirements at all times. MRMCA also retains the right to conduct random inspections of concrete production facilities and to conduct inspections of specific facilities in response to complaints received. Failure to allow for these inspections to take place shall result in a loss of the concrete producer's *Certificate and membership*.

2 PORTABLE PLANTS

Procedures for evaluation of portable plants shall follow the same criteria as permanent plants, with emphasis on:

Clause 1.2.1 Aggregates storage arranged to assure that each aggregate as removed is clean, distinct and not intermingled with others.

Clause 2.0 Plant scales shall be calibrated in accordance with CSA A23.1. A valid scale test report must be submitted to the Auditor prior to the issuance of the Certificate of Certification. The scales shall be rechecked whenever the plant is moved to a new location or whenever alterations or additions are made to the plant that might affect the weighing accuracy of the scales.

Clause 4.2 (if applicable) The truck fleet intended for use with the portable plant shall be inspected and listed by number or designation in "Summary of Fleet Condition" as Pass or Fail with explanation.

The Certificate shall be valid for a period of three (3) years. However, the certification is site specific. Should the portable plant be relocated, the certificate is voided and recertification is required. It is imperative that upon application for certification using this *Audit and Check List*, the batch plant site be clearly stated by street address, lot number, or rural Section-Township-Range.

The Association shall apply a surcharge for the timely inspection of portable plants over and above the standard application fee as deemed reasonable to the situation.

3 TERMS and CONDITIONS

1. Conformance Agreements: Conformance with the requirements of the *Audit and Check List* must be assured. The completion of the Auditor's Conformance Agreement, validated by the signature and seal of the inspecting Auditor and the completion of the Owner's Conformance

Agreement validated by the signature of the signing authority of the Owner will make the plant eligible for a “Certificate”.

2. All producing plants belonging to the Producer Member shall be certified.

3. Certification:
 - a. The successfully completed Audit shall be valid for a period of three (3) years and shall expire on December 31st of the third year
 - b. The Certificate becomes invalid upon ownership change of the plant
 - c. The Certificate may be revoked at the sole discretion of MRMCA for non-compliance
 - d. All current documentation shall be available for inspection.

Non-conformance with these requirements can result in loss of Certification of the concrete production facility. Re-application is subject to the terms and conditions of the MRMCA plant certification requirements.

REFERENCES (Reference is made only to items not considered self-explanatory):

1. CSA-A23.1 *Concrete Materials and Methods of Concrete Construction (2009)* and CSA-A23.2 *Methods of Test for Concrete* (current) published in one volume by the Canadian Standards Association
2. Concrete Plant Standards (Metric), Twelfth Revision, November 2000. Concrete Plant Manufacturers Bureau, 900 Spring Street, Silver Spring, Maryland 20910, USA
3. Truck Mixer, Agitator and Front Discharge Standards, TMMB-100-05, 2005 Printing. Truck Mixer Manufacturers Bureau, 900 Spring Street, Silver Spring, Maryland 20910, USA
4. *Certification of Ready Mixed Concrete Production Facilities*; January 2006; National Ready Mixed Concrete Association, 900 Spring Street, Silver Spring, Maryland, USA 20910

CHECK LIST FOR READY MIX CONCRETE PRODUCTION FACILITIES

1.0 RAW MATERIALS

1.1 Cementitious Materials

- .1 Bins or silos are tight and with free movement to discharge opening []
- .2 Separate storage is provided for different types of cementing materials to prevent contamination – common bag houses should shake down into the least affected cementing material []
- .3 Intra-plant handling prevents contamination []
- .4 All cementitious feed pipes are marked and designated (e.g. GU, HS, Fly Ash, etc)[]

1.2 Aggregates

- .1 Aggregates stockpiles are arranged to assure that each aggregate as removed is clean, distinct and not intermingled with others
- .2 Procedures for unloading and storing aggregates prevents harmful segregation []
- .3 Intra-plant handling and transportation prevents harmful segregation []
- .4 Separate storage bins or compartments for each size and type of aggregate are properly constructed and charged to prevent mixing of different sizes and types []

1.3 Water

- .1 Adequate supply with pressures sufficiently constant or regulated to prevent interference with accuracy of measurement where flow meters are used to measure mixing water – the flow meter shall be calibrated and documented at intervals of no more than six months []
- .2 The concrete producer must provide certification that the water used meets the requirements of CSA A23.1 at all times. Water for concrete production may be from one of the following sources:

Potable source (water is supplied by a government/commercial agency) []

Non-potable source (satisfactory history of strength and durability made with the water has been demonstrated) []

Water from concrete production operations []

1.4 Admixtures

- .1 Storage of liquid admixtures is provided to prevent damage by freezing or contamination []

- .2 Agitation is provided for liquid admixtures that are not stable solutions []
- .3 Each admixture shall be measured and discharged separately []

1.5 Materials for Winter Production

- .1 For winter concrete production, plant heating facilities for water and/or aggregates are provided to ensure that concrete temperatures conform to CSA A23.1 []

2.0 Scales

The Auditor will only accept mechanical inspection and calibrations as performed by a qualified technician employed by an authorized Scale Manufacturer or Scale Company. The Scale Manufacturer or Scale Company has the responsibility to ensure the mechanics are in good working order as per industry standards and calibration tolerances are met for each scale. Acceptance will be based on the MRMCA Scale Check Data Form (Appendix A), completed and signed by a technician of the Scale manufacturer or Scale Company.

Scales must be checked and calibrated in accordance with CSA A23.1, or whenever alterations are made to the Plant that may affect the weighing accuracy of the scales or whenever the plant is moved.

General Information

- a. Each scale is comprised of a suitable system of lever and/or load cells, which will weigh consistently within the tolerance specified in the MRMCA Scale Check Data Form (Appendix A), with loads indicated either by a beam with a balance indicator or a full reading dial or digital readout display verifying accuracy.
- b. Each scale must be calibrated at a minimum of 2 points and at 20% and 80% of the scales normal operating capacity.
- c. The Scale Manufacturer or Scale Company must supply the necessary documentation that government approved test weights are used, which are certified and traceable.
- d. The Scale Manufacturer or Scale Company must provide a procedure or check list which is used for the inspection and to document all mechanical checks, calibration test results and any deficiencies in the scale or weighing system.
- e. The Scale Manufacturer or Scale Company’s qualified technician must sign the MRMCA Scale Check Data Form certifying that all requirements have been met.
- f. All scale check and calibration reports/records must be kept on site and must be available for inspection at all times.

The MRMCA Scale Check Data Form is signed and certified by a qualified technician employed by a Scale Manufacturer or Scale Company. []

3.0 BATCHING EQUIPMENT

3.1 General

The plant is described as follows:

A. Permanent [] B. Portable+ ID#_____ []

3.2 Batching Method

Batch → Truck Mixer []
Batch → Stationary Mixer → Truck Mixer []
Batch → Stationary Mixer → Agitating Unit []
Batch → Stationary Mixer → Non-Agitating Unit []
Portable Cement Silo []

3.3 Requirements

- .1 Batchers for weighing materials consist of suitable containers freely suspended from a scale system and equipped with the necessary charging and discharging mechanisms. Batchers shall be inspected to ensure they are freely suspended before and after loading. []
- .2 Cementing materials are weighed on a scale and in a hopper separately from other ingredients. Portland cement shall be batched prior to the batching of any supplementary materials. []
- .3 Batchers are capable of receiving rated load without contact of the weighed material with the charging mechanism. []
- .4 Cement material batchers are equipped with dust seals between charging mechanism and hopper, installed in such a way that weighing accuracy will not be affected; cementing materials weigh hopper vented to permit air escape; hopper is free from build-up and self-cleaning to ensure complete discharge. []
- .5 Batchers charging mechanism is designed, operated and maintained to stop flow of material within the weighing tolerances specified in Section 3.4 and prevents loss of material when closed. []
- .6 Vibrators and other appurtenances are installed and operated so as not to affect the accuracy of weighing. []
- .7 The entire weigh batching system and equipment are protected against weather conditions. []

- .8 Each admixture dispenser is capable of measurement within tolerances indicated in Section 3.4. Each admixture shall be measured separately. []

3.4 Accuracy of Plant Batching

Other than SCM's, the quantity of material batched shall be between 30% and 100% of the scale capacity.

- .1 Total cementitious material measured by mass within ± 1 percent of the total desired amount (See item 2 below) []
- .2 Aggregates measured by mass within ± 2 percent of the desired amount []
- .3 Water measured by volume or mass within ± 1 percent of the desired amount []
- .4 Powdered admixtures measured by mass and paste, or liquid admixtures by either mass or volume within ± 3 percent of the desired amount or ± 30 grams whichever is greater. []

NOTE:

1. Moisture compensation devices are not mandatory for this Audit; however the MRMCA recognizes the need for aggregate moisture compensation when producing concrete of consistent quality.
2. CSA A23.1 Table 24 indicates that for small quantities of concrete (30% or less of the scale capacity) the batching tolerance for cement and SCM's is increased to 4% of the required quantity.

3.5 Batching Systems – Definitions and Components

- .1 **MANUAL BATCHER** is a system wherein all ingredients are charged, weighed and discharged with gates or valves actuated manually and with the accuracy of the measuring operations dependent upon the operator’s visual observation of the scale []
- .2 **SEMI –AUTOMATIC BATCHER** is a system wherein the weighing of all ingredients is actuated separately by the operator but is terminated automatically when the desired mass has been reached. It is interlocked to assure that the discharge mechanism cannot be activated until the mass is within the tolerance specified in section 3.4 for those ingredients []
- .3 **AUTOMATIC BATCHER** is a system wherein the entire sequence of measurement of all ingredients actuated by a single operation (i.e. pushing a button or inserting a punch card) and then terminated automatically when the designated mass or volume of the materials has been reached. Interlocking of the automatic controls shall assure that: []
 - a. The charging device cannot be actuated until the scale has returned to zero balance within ± 0.3 percent of its capacity []
 - b. The charging device cannot be actuated if the discharge mechanism is open []
 - c. The discharging device cannot be actuated if the charging mechanism is open []
 - d. The discharging device cannot be actuated until the designated weight is within the tolerance specified in Section 3.4. When different kinds of aggregates of different kinds of materials are weighed cumulatively on a single scale, interlocked sequential controls shall be provided for each material. []

3.6 Portable Cement Silos for Separate Material Addition

The portable auxiliary cement silos must meet all of the existing requirements, including:

- .1 Having suitable scale equipment necessary to measure the actual amount of cementing materials placed in each load as per the tolerance requirements of 3.4 []
- .2 Maintain batch records showing actual mass of the cementing materials added to each load of concrete produced []
- .3 Meeting the existing scale calibration requirements including calibration every time the silo is moved []

Silos inspected: (record serial or identification number)

4.0 MIXERS & TRANSPORTATION EQUIPMENT

4.1 Stationary Mixer

Definition:

Mixers installed at a plant to partially or completely mix all ingredients of the concrete.

- .1 The mixer is capable of producing uniform concrete in the mixing time designated by the manufacturer or in the time designated in CSA A23.1. The concrete shall be considered uniform if it meets the requirements of CSA A23.1, "Determination of Within Batch Uniformity". A within batch uniformity test is only mandatory when discharging from a stationary mixer into an agitating or non-agitating unit. []

4.2 Truck Mixers

Definition:

Concrete mixers mounted on trucks or other vehicles, used for the complete mixing of concrete ingredients after they have been batched at the plant. Each acceptable truck mixer shall conform to the following requirements:

- .1 Charging and discharge openings and chute in good condition, free from appreciable accumulations of cement or concrete and with hopper and chute surfaces clean and smooth.
- .2 Drum of such size that the rating as a mixer in volume of mixed concrete does not exceed those set by the Truck Mixer Manufacturers Bureau (TMMB). This requirement is met by all mixers carrying a rating plate of the TMMB.
- .3 Provided with a plate (secured on frame or door interior) showing the mixer manufacturer's recommended operating speed for mixing and must have demonstrated the capability to operate satisfactorily at the recommended speed.
- .4 On units equipped to batch mixing water, equipment to be in proper working condition; gauge glasses clean and legibly graduated; water pump or injection system in good working order. *Site glasses are not required in freezing weather.*
- .5 In the event that the mixer blade wear exceeds 10%, or the mixer design has been significantly altered, the Auditor will consider the mixer satisfactory only when that unit demonstrates compliance with the requirements of CSA A23.1 Table 13, "Determination of Within Batch Uniformity".

4.3 Agitating Units

Definition:

Drums or containers, mounted on trucks or other vehicles, in which completely mixed concrete is kept sufficiently agitated during delivery to prevent segregation. Each acceptable agitating unit shall conform to the following requirements:

- .1 Agitating units conform to the requirements for Truck Mixers except drum or container of such size that the rating as an agitator in volume of mixed concrete does not exceed the volumes set by TMMB.

- .2 Agitating units must be provided with a plate showing the mixer manufacturer's recommended operating speed for agitating.
- .3 Agitating units have the capability to operate at the recommended speed.

4.4 Non-Agitating Units

Definition:

Containers, mounted on trucks or other vehicles, for delivering completely mixed concrete, not constructed or equipped to keep the mass of concrete agitated in the container. Each acceptable non-agitating unit shall conform to the following requirements:

- .1 Interior surfaces smooth and watertight, with rounded corners
- .2 Gates or other means provided for the controlled discharge of the concrete
- .3 Interior free from excessive accumulation of hardened concrete and from obstruction or deterioration sufficient to interfere with the proper discharge of the concrete

NOTES:

- 1. The Auditor will evaluate all available truck mixers and agitating units used to deliver concrete from the plant. The evaluation will be based on a study of the records of truck mixer purchase, inspection and maintenance. Units that meet the above requirements will be satisfactory.
- 2. Broker trucks may also be used for concrete mixing and delivery provided each truck used has a valid truck certification sticker, obtained only through the MRMCA.
- 3. New concrete trucks purchased by the concrete producer conforming to the requirements of clauses 4.2 and 4.3 do not require a truck inspection. The concrete producer shall immediately notify the MRMCA of a new truck mixer purchase and shall supply MRMCA with the truck number. The concrete producer's truck records will be updated and a certification sticker will be issued for the truck.
- 4. Used concrete trucks purchased by the concrete producer must conform to the requirements of clause 4 and requires a truck inspection by the Auditor.

5.0 PLANT DOCUMENTATION

5.1 Delivery Ticketing System (must include the following):

- .1 Name of company and plant location if company operates more than one plant []
- .2 Serial number of ticket []
- .3 Truck number []
- .4 Name of purchaser []
- .5 Specific job designation (name and location) []
- .6 Specific class or designation (i.e.: Mix ID) of concrete identifiable with terminology []
- .7 Volume of concrete (cubic meters or cubic yards) []
- .8 Delivery date []
- .9 Time when truck was loaded []
- .10 Time when truck was unloaded []
- .11 Volume of extra water added in accordance with CSA A23.1 []
- .12 The delivery ticket must carry a cautionary note []

5.2 Records

Materials batched shall be recorded for each batch and kept for each plant. The record or log book shall:

- .1 Register the quantity of each material batched []
- .2 Provide for the identity of the batch along with the truck ID in which it was delivered []
- .3 be properly secured []

5.3 Conformance Support Documents

- .1 Scale calibration records – Scale Check Data Form on file []

OWNER'S CONFORMANCE AGREEMENT

Terms and Conditions:

The Company agrees to maintain these facilities and equipment in compliance with this Approved Quality Program Audit and Check List requirements at all times and will promptly correct any deficiencies that develop.

The Company agrees that all producing plants shall be MRMCA certified at all times.

The Company agrees to allow an MRMCA appointed Auditor to inspect the plant on a random or as needed basis.

Name of Company's signing Authority

Signature of Company's signing Authority

Title of Company's signing Authority

Email Address

Date

NOTES:

1. *Non-Conformance with the requirements of this Audit may result in loss of this certification.*
2. *The Audit and Check List indicates that plant facilities are satisfactory for the production of quality concrete when properly operated. The conformance of the concrete itself with specification and/or customer requirements must be verified by the Terms and Conditions of the sales agreement.*

VERIFICATION OF INSPECTION AND APPLICATION FOR CERTIFICATE

The undersigned, a registered Professional Engineer in the province of Manitoba, asserts that an inspection of the ready mix concrete plant described below

(Company Name)

(Plant & Location)

has been conducted and that the information provided on this Audit and Checklist is accurate and complete. Application is hereby made for the issuance of a Certificate for this plant as follows:

General Operations

Transit Mixing
 Central Mixing
 Shrink Mixing
 Seasonal Restriction

Batching System

Manual
 Semi-Automatic
 Automatic

Recording (automatic or manual)

Cement
 Aggregate
 Water
 Admixture

(Signature and Seal of Professional Engineer)

(Date of Inspection)