

CONCRETE SASK  
CONCRETE PRODUCTION FACILITIES  
CERTIFICATION PROGRAM

PLANT CERTIFICATION MANUAL

SEVENTH EDITION

OCTOBER 2019



**PRODUCTION FACILITIES INFORMATION**

Company Name (the "**Applicant**"): \_\_\_\_\_

Company Address: \_\_\_\_\_

Plant Location: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

Fax Number: \_\_\_\_\_

Email: \_\_\_\_\_

**INSPECTION INFORMATION**

Inspection Date: \_\_\_\_\_

Auditing Engineer: \_\_\_\_\_

Technical Personnel: \_\_\_\_\_

## TABLE OF CONTENTS

	Page
PRODUCTION FACILITIES INFORMATION .....	ii
INSPECTION INFORMATION .....	ii
TABLE OF CONTENTS .....	iii
FORWARD AND APPLICANT ACKNOWLEDGMENT .....	iv
GENERAL.....	v
INSPECTION PROCEDURES .....	viii
CHECKLIST FOR READY MIXED CONCRETE PRODUCTION FACILITIES.....	1
MATERIAL STORAGE AND HANDLING .....	1
A.1    Cement & Cementitious Materials.....	1
A.2    Aggregates .....	1
A.3    Water.....	1
A.4    Admixtures.....	1
A.5    Winter Concrete.....	1
BATCHING EQUIPMENT .....	2
B.1    Scales.....	2
B.2    Batchers – General.....	3
B.3    Accuracy of Plant Batching .....	4
B.4    Batching Systems – Definitions and Requirements of Components.....	7
B.5    Recorders and Records .....	8
B.6    Central Mixer .....	8
B.7    Truck Mixers .....	9
B.8    Agitators .....	11
B.10   Ticketing System .....	11
REFERENCES .....	12
VERIFICATION OF INSPECTION AND APPLICATION FOR CERTIFICATE .....	13
SCALE CHECKING AGREEMENT AND VOLUMETRIC BATCHING DEVICES AND DISPENSERS.....	14
TRUCK MIXER FLEET MAINTENANCE AGREEMENT .....	15
ACKNOWLEDGEMENT.....	16

## FORWARD AND APPLICANT ACKNOWLEDGMENT

### a) Forward

Concrete is a manufactured product, the quality and uniformity of which correlates to a producer's manufacturing process (including production controls). The concrete industry recognizes that good quality ready mixed concrete ("**Concrete**") is produced by mixing suitable ingredients in appropriate proportions. These ingredients must be thoroughly blended, and producers must ensure that the finished product is delivered to customers without damage. The production of Concrete is contingent on multiple factors, including, but not limited to, utilization of appropriate good quality, well-maintained equipment.

Saskatchewan Ready Mixed Concrete Association Inc. (referred to as Concrete Sask) is a member of the Canadian Ready Mixed Concrete Association (CRMCA). Concrete Sask has a Concrete production facilities certification program (the "**Program**") that its members may access. Under the Program, an independent party inspects a production plant and determines whether the plant is capable of producing good quality Concrete, based on whether the plant meets the specifications that are set out in the checklist contained within this Manual (the "**Checklist**").

A certificate of conformance issued by Concrete Sask to a producer of a Concrete production facility (a "**Certificate**") confirms that the producer's manufacturing plant meets the specifications set out in the Checklist.

Participation in the Program is voluntary.

### b) Acknowledgment by Applicant

In executing and delivering the Acknowledgment contained in this Manual, the Applicant acknowledges and agrees that neither Concrete Sask nor Concrete Sask's directors, officers, employees or representatives have made or purport to make any representations, warranties, or covenants with respect to the specifications or information contained in this Manual or the Checklist or the results obtained by use of the Checklist; nor is Concrete Sask liable for any damage, loss or claims that the Applicant may incur in relation to a plant inspection or the Checklist, including those of an incidental or consequential nature.

The Applicant acknowledges and agrees that multiple factors apply to the manufacturing of good quality Concrete. Concrete Sask provides no assurance that a plant that is certified in accordance with the Program will deliver good quality Concrete. The Certificate is intended only to evidence that certain manufacturing plant capabilities exist.

## GENERAL

### a) The Manual

This Manual consists of the following:

1. Forward and Acknowledgement
2. General
3. Inspection Procedures
4. Checklist for Ready Mixed Concrete Production Facilities
  - a. Material Storage and Handling
  - b. Batching Equipment
  - c. References
5. Verification of Inspection and Application for Certificate
6. Scale Checking Agreement and Volumetric Batching Devices and Dispensers ("**Scale Checking Agreement**")
7. Truck Mixer Fleet Maintenance Agreement
8. Acknowledgment Form

Any ready mixed Concrete producer who is a member of Concrete Sask may obtain, free of charge, copies of this Manual for each plant that a producer wishes to have inspected under the Program.

### b) Inspection Process

Any member of Concrete Sask that wishes to apply for certification under the Program may contact Concrete Sask and request an inspection of the producer's manufacturing plant. Concrete Sask will then retain an independent, registered Professional Engineer, licensed to practice engineering in Saskatchewan (the "**Engineer**") for the inspection. The Engineer will have experience in Concrete materials and Concrete construction. The Engineer will inspect the applicant's production facility or will arrange for an accredited professional technologist from his or her engineering firm to do so (in either case, the "**Inspector**").

The Inspector will assess whether a producer's manufacturing facilities conforms to all of the specifications set forth in the Checklist. The producer is expected to provide the Inspector with reasonable co-operation during the inspection, including with respect to working space, labour and access to equipment. Wherever reasonably possible, the Inspector will work with the producer to correct any deficiencies, as the inspection progresses. Concrete Sask encourages producers to instruct their staff to co-operate with the Inspector in order to expedite the inspection, and where necessary and possible, to correct deficiencies in plant installations or operations as the inspection progresses.

**c) The Checklist**

While inspecting a production facility, the Inspector will complete the Checklist, to determine whether the producer's plant conforms to all of the specifications in the Checklist.

In completing the Checklist, the Inspector will enter one of the following symbols, as appropriate, in the space provided in the Checklist.

√ if the requirement is met

**F** (failed) if the requirement is not met

**N/A** (not applicable) if an item is not applicable to the type of plant being inspected

The Inspector may append explanations where the Inspector considers that useful.

The Inspector will initial each page of the Checklist, and will submit the original of the completed Checklist and accompanying documents to Concrete Sask. The Inspector will provide a copy of the completed Checklist to the producer for the producer's records and will retain a second copy for the Engineer's file.

**d) Ancillary Documents**

Following the Inspector's inspection and confirmation that the plant conforms with all of the items in the Checklist, the Inspector will then ask an authorized representative of the producer to sign the Scale Checking Agreement, the Truck Mixer Fleet Maintenance Agreement, and the Acknowledgment contained herein (collectively, the "**Ancillary Documents**") as well as the Certificate.

**e) Issuance of a Certificate and Term of the Certificate**

Concrete Sask will issue a Certificate to a producer if the producer's plant conforms to all of the specifications set forth in the Checklist, as determined by the Engineer, and the producer has executed the Certificate and all of the Ancillary Documents.

Unless earlier revoked in accordance with the terms contained in this Manual, the Certificate is valid for a period commencing on the date specified in the Certificate and expiring on the expiration date specified in the Certificate.

A producer may not assign a Certificate to any other party, and a Certificate ceases to be valid immediately upon the sale of a production facility to a third party or following any change in control or ownership of the producer to whom a Certificate was issued.

**f) Recertification**

A producer may apply to Concrete Sask for recertification of a plant prior to the expiration date of the certificate. A plant inspection will be necessary as part of the recertification process and **Concrete Sask will require the producer to execute and deliver new Ancillary Documents.**

**g) Suspension or Revocation of a Certificate**

Concrete Sask may suspend or revoke any Certificate issued by Concrete Sask, following a resolution passed by a two-thirds vote of Concrete Sask's Board of Directors (a "**Resolution**"), for any of the following reasons (each, an "**Event**"):

Concrete Sask becomes aware that the producer is not maintaining the Concrete plant in conformance with the completed Checklist associated with the applicable Certificate, or fails to comply with any of the requirements contained in the Ancillary Documents that the producer submits to Concrete Sask.

- i) The plant subject to the Certificate changes ownership as noted in paragraph e, page vi.
- ii) The plant is moved.
- iii) Changes are made to the plant **with respect to items listed in the Checklist or the Ancillary Documents that the producer executed prior to issuance of the Certificate.**

provided that no such suspension or termination shall take place until the Certificate holder has had an opportunity to dispute the suspension or termination in accordance with the following procedure:

- i) Upon becoming aware of an Event, Concrete Sask shall provide written notice (using the contact information indicated in the Acknowledgment) to the Certificate holder that Concrete Sask plans to suspend or terminate the Certificate holder's Certificate (the "**Notice**"), and why. Within **15** days following the date of the Notice (the "**Response Deadline**"), the Certificate holder may submit a response to Concrete Sask (a "**Response**"), disputing Concrete Sask's intention to revoke the Certificate, and explaining the basis for the certificate holder's dispute.
- ii) If the Certificate holder submits a Response, it shall also provide relevant supporting documentation for consideration by Concrete Sask's Board of Directors.
- iii) If Concrete Sask receives a Response from the Certificate holder, then within **30** days after Concrete Sask's receipt of the Response, and following a Resolution, Concrete Sask shall issue a final written decision regarding whether the Certificate is revoked or suspended (effective as of a specified date), or whether the certificate will remain in force.
- iv) If the Certificate holder does not provide a Response on or before the date of the Response Deadline, the Certificate shall be deemed to be suspended or revoked, as the case may be, immediately following any Resolution to that effect. Concrete Sask shall provide the producer with prompt notice of such suspension or revocation.

## INSPECTION PROCEDURES

The references listed at the end of this section provide useful information for evaluating the production facilities. The information listed under this "Inspection Procedures" heading does not modify the requirements of certification but is provided for guidance with respect to certain items listed in the Checklist. The items listed below in this section of the Manual are numbered in conformance to the Checklist.

### B.1 Scales

In lieu of the Engineer's own detailed, independent check of scale accuracy, the Engineer may in the Engineer's discretion accept evaluation of a qualified expert. The Engineer may, in the Engineer's discretion, determine that inspections made by a scale manufacturer's technical staff are satisfactory for purposes of the Checklist. In checking a scale system for accuracy under Section B.1.b of the checklist, cut-off, signaling and dampening devices and similar appurtenances may be removed.

#### B.1.d Mass Setting Devices

Depending on the type of plant, mass-setting devices may be scale-poisers, pointers, dials, punch cards, etc. Whatever is used must permit distinguishing differences as small as 0.1% of the capacity of each scale.

### B.4 Batching Systems

A usual problem will be to distinguish between automatic and semi-automatic systems or between semi-automatic and manual systems. The former two can be distinguished as follows:

In an automatic system, the entire sequence of measurement of all major ingredients - cementitious materials, aggregates and water, is actuated by a single operation (i.e., pushing a button, accessing a computer mix code or inserting a card) after which the cycle is completed without further attention;

In a semi-automatic system, the weighing of an ingredient is actuated separately by the operator, but is terminated automatically when the proper amount has been reached; and

In a manual operation, cut-off of a material at the proper quantity is accomplished by the operator. The system shall be classed as manual if any major ingredient - cementitious materials, aggregates or water - is batched manually.

### B.5 Central Mixer

Procedures for measuring the uniformity of concrete from central mixers are given in CSA Standard CAN A23.1. In using the test, the Engineer will require that the materials be batched and the equipment be operated in accordance with the methods employed in operation of the plant.

## **B.6 Truck Mixers and Agitators**

Evaluation of delivery units must involve some subjective judgement. Particularly in large fleets, defects may exist in a small percentage of units as they approach the time for scheduled maintenance or rehabilitation. It should be assumed however, that these would not constitute more than ten percent (10%) of the fleet at one time. The record of acceptable and unacceptable units is intended to provide a general picture of condition. A purchaser may request up-to-date evaluations, if he/she intends to restrict the use of questionable units.

## CHECKLIST FOR READY MIXED CONCRETE PRODUCTION FACILITIES

### MATERIAL STORAGE AND HANDLING

#### A.1 Cement & Cementitious Materials

- A.1.a Bins or silos are tight and with free movement to discharge opening.
- A.1.b Where storage is provided for different types of cement or cementitious materials, different materials are isolated to prevent intermingling or contamination.

#### A.2 Aggregates

- A.2.a Aggregate storage arranged to ensure that each aggregate as removed is clean, distinct and not intermingled with other.
- A.2.b Procedures for unloading and storing aggregates are such as to prevent harmful segregation and breakage.
- A.2.c Interplant handling and transportation such as to prevent harmful segregation.
- A.2.d Separate storage bins, compartments or storage areas for each size and type of aggregate is properly constructed and charged to prevent mixing of different sizes or types.

#### A.3 Water

- A.3.a Adequate supply, with pressure sufficiently constant or regulated to prevent interference with accuracy of measurement.

#### A.4 Admixtures

- A.4.a Storage tanks and handling/dispensers for liquid admixtures located to prevent damage by freezing or contamination.
- A.4.b Agitation provided for liquid admixtures that are not stable solutions.

#### A.5 Winter Concrete

- When a plant produces concrete regularly in sub-freezing weather, heating facilities for water and/or aggregates are provided.

Engineer Initials \_\_\_\_\_

**BATCHING EQUIPMENT**

**B.1 Scales**

- B.1.a Each scale comprised of a suitable system of levers or load cells which will weigh consistently within the tolerance given in B.1.b, with loads indicated whether by a beam with balance indicator or a full-reading dial. Digital read-out or display may be accepted in lieu of beam or dial indication provided readings distinguish sufficiently small differences to permit verifying accuracy in accordance with B.1.b.
- B.1.b Each scale accurate to within  $\pm 0.20\%$  of scale capacity throughout the range of use. For direct digital read-out, the tolerance shall be increased to  $\pm 0.25\%$  to allow for tracking restrictions.
- B.1.c Plant owner agrees to recheck scales in accordance with the following circumstances of plant operation:
- At intervals of no longer than one year;
  - Whenever alterations or additions are made to the plant which might affect the weighing accuracy of the scales. See the Scale Checking Agreement.
- B.1.d Mass-setting devices capable of being set to 0.1% of the total capacity of the scale. (No mass-setting device is required for a dial scale in a manual plant.)
- B.1.e Pivot and bearing loops of all scales made of hard metal to assure sustained accuracy. There must be no evidence of burring or wear.
- B.1.f Lever system scales so designed that center of gravity of gross load always lies within load pivots.
- B.1.g Beam Scales:
- Provided with zero balance beam, balance indicator and separate weighing beam for each ingredient of a batch to be weighed on the same scale.
- B.1.h Beam poises corrosion resistant, equipped with positive and accurate holding devices, and capable of being set to the minimum graduate interval, which shall not be greater than 0.1% of capacity with a clear interval of not less than 0.8mm.

Engineers Initials \_\_\_\_\_

Concrete Sack Plant Certification Checklist

- B.1.i Balance indicators sufficiently sensitive to show movement when mass corresponding to 0.1% of scale capacity is placed in the batch hopper at a load equal to or greater than 50% of scale capacity; Pointer travel at least 5% of net rated capacity of largest weigh beam or 90kg., whichever is less, for under-load and 4% or 45 kg., whichever is less, for over-load; provision made for damping oscillation or pointer.
- B.1.j Load-cell scales arranged to transmit load to one or more cells, directly or through a system of levers in such a way that the cell system registers the entire load accurately on the load indicating device.
- B.1.k Dial Indicating Scales: 
  - Have dial indicators and dial faces protected from dust
  - Dials indicate load in batches continuously from zero balance to full weighing capacity of scale.
  - The clear interval between graduations on the circular reading line of the dial face not less than 1mm.

**B.2 Batchers – General**

- B.2.a Batchers for weighing materials consists of suitable containers freely suspended from a scale system and equipped with the necessary charging and discharging mechanisms.
- B.2.b Cement and other cementitious materials weighed on a scale and in a weigh hopper separately from other ingredients.
- B.2.c Batchers capable of receiving rated loads without contact of the weighed materials with the charging system.
- B.2.d Cement batchers equipped with dust seal between charging mechanism and hopper, installed in such a way that weighing accuracy will not be affected; cement weigh hopper vented to permit air escape; hopper self-cleaning to ensure complete discharge.
- B.2.e Batchers charging mechanism designed and operated to stop flow of material within the weighing tolerances specified in section B.3 and preventing loss of material when closed.

Engineer Initials \_\_\_\_\_

Concrete Sask Plant Certification Checklist

- B.2.f Vibrators and other appurtenances installed and operated so as to not affect the accuracy of weighing.
- B.2.g The entire weigh batching system and equipment sufficiently protected against weather conditions.
- B.2.h Admixture dispensers capable of measurement within tolerances indicated in B.3.d, and equipped with a calibrated container in which the admixture may be collected to verify the accuracy of measurement; for positive displacement dispensing systems, such verification by means of a calibrated container may be on a periodic basis.
- B.2.i Admixture dispenser(s) located to permit batching personnel to observe and adjust the amount of admixture being batched.

**B.3 Accuracy of Plant Batching**

Note:

For weighed ingredients, accuracy of batching is determined by comparison between the desired weight<sup>1</sup> and the actual scale reading; for volumetric measurement of water and admixtures, accuracy is determined by checking the discharged quantity by weight on a scale or by volume in an accurately calibrated container.

- B.3.a Cement and other cementitious materials measured by weight within  $\pm 1\%$  of the desired weight<sup>1</sup>, for batch quantities between 30% and 100% of scale capacity<sup>2</sup>.
- B.3.b Aggregates measured by weight within  $\pm 2\%$  of the desired weight<sup>1</sup>, for batch quantities between 15% and 100% of scale capacity<sup>2</sup>.
- B.3.c Water measured by volume or weight within  $\pm 2\%$  of the desired amount for batch quantities between 30% and 100% of the measuring capacity<sup>2</sup>. Company official agrees to recheck batching accuracy of volumetric water batching devices (including water meters) not less frequently than every 90 days. See Agreement to Regularly Check Scales.

<sup>1</sup>As indicated to the batch person, corrected for aggregate moisture, if required.

- B.3.d Admixtures measured to within  $\pm 3\%$  of the desired amount or  $\pm 30$  grams, whichever is more, for batch quantities between 10% and 100% of the measuring capacity. Liquid admixtures are to be measured by volume or weight and powdered admixtures are to be measured by weight.

<sup>2</sup>The lower limit of batch quantities referred to in B.3.a, B.3.b, B.3.c and B.3.d is not to be interpreted as a limit on the size which can be satisfactorily produced.

Engineer Initials \_\_\_\_\_

- B.3.e Compensation for free moisture $\mp$  on aggregates as it affects aggregate weights and slump control. Suitable combination of pre-batching storage and manual or automatic measurement of aggregate moisture to provide aggregate of fairly consistent moisture content to the batcher and to detect changes of 1% in the moisture content of aggregate; procedure for adjustment of aggregate batch weights for changes in their moisture content of 1% by weight of dry aggregate. Accuracy of devices used for automated measurement of aggregate moisture is verified not less frequently than every 90 days.

$\mp$  Aggregates shall be measured by mass. Batch masses shall be based on the required mass of saturated surface-dry aggregate **corrected** for the moisture conditions of the aggregate at the time of batching.<sup>1</sup>

Mixing Water shall consist of all water in the batch, including water occurring as surface moisture on the aggregate, water contained in admixture solutions, wash water, slurry water and ice used as a concrete coolant. Ice shall be measured by mass. Added liquid water may be measured by mass or volume.

Note: Variations in aggregate moisture content, especially of the finer materials, can be significant. Frequent checks, followed by any required adjustments to the batch quantities of aggregate and water, are necessary for achieving good quality control.<sup>2</sup>

1. Clause 5.2.2.5, Aggregates, CSA A23.1-19
2. Clause 5.2.2.6, Mixing Water, CSA A23.1-19

Concrete Sisk Plant Certification Checklist

Engineer Initials \_\_\_\_\_

#### B.4 Batching Systems – Definitions and Requirements of Components

Manual Batcher – a device for measuring cementitious materials, water or aggregates consisting of charging, weighing and discharge apparatus, with gates or valves actuated manually and with the accuracy of the measuring operation dependant upon the operator’s visual observation of the scale.

Semi-Automatic Batcher – a device for measuring cementitious materials, water or aggregates consisting of charging, weighing and discharge apparatus, in which the gates or valves are separately opened manually to weigh the material but are closed automatically when the desired weight of the material has been reached. It is interlocked to assure that the discharge mechanism cannot be opened until the weight is within tolerance specified in sections B.3.a, B.3.b or B.3.c for the weighed ingredient.

Automatic Batcher – device for measuring cementitious materials, water or aggregates consisting of charging, weighing and discharging apparatus such that, when a start switch actuates the mechanism, the gates and valves will open automatically for the start of the weighing operation and closes automatically when the designated weight of the material has been reached. Interlocking of the automatic controls shall assure that:

- The charging device cannot be actuated until the scale has returned to zero balance within  $\pm 0.3\%$  of its capacity;
- The charging device cannot be actuated if the discharge mechanism is open;
- The discharge device cannot be actuated if the charging mechanism is open;
- The discharge device cannot be actuated until the designated weight is within tolerance specified in sections B.3.a, B.3.b or B.3.c, above.

Manual Batching Records – Manual batching records are considered acceptable for the purpose of plant certification, if a computerized record keeping system is not in place, provided:

- All records are written and maintained in ink;
- All records note the following:
  - Date batched;
  - Time batched;
  - Weights of aggregates, cementitious materials, admixtures and water batched for each load of concrete; and
  - Volume of each load of concrete.

When different kinds of aggregates or different kinds of cement or cementitious materials are weighed cumulatively on a single scale, interlocked sequential controls shall be provided for each material.



Engineer Initials \_\_\_\_\_

**B.5 Recorders and Records**

Recorders – Devices that provide a permanent record of the quantity of cementitious materials, aggregates, water or admixtures measured into a particular batch of concrete.

	Cementitious Materials	Aggregate	Water	Chemical Admixtures
A graphical recorder provides a record on a chart simultaneously with the indication of the scale, as the materials are being weighed or measured. A graphical recorder shall register scale readings within $\pm 2\%$ of total scale capacity.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>OR</b>		<b>OR</b>		
A digital recorder provides a printed record of the quantity of material weighed or measured. A digital recorder shall reproduce the scale reading within $\pm 0.1\%$ of scale capacity.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Manual Records	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

---

**Recorders shall:**

Be properly protected, i.e., provided with effective security to prevent tampering with records. (Graphical recorders must be in a locked housing and capable of being read without unlocking.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Provide for identifying the particular batch with the corresponding delivery ticket.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Register empty balance or tare to within $\pm 0.3\%$ of scale capacity for weighed ingredients.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Register the quantity of ingredients or ingredients batched.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**B.6 Central Mixer**

B.6.a **Definition:** A stationary mixer installed at the plant for the purpose of mixing the concrete completely (central mixing) or partially (shrink mixing).

B.6.b **Uniformity of Mixing:** For central mixing operations, the mixer at the plant shall be capable of producing uniform concrete in the mixing time recommended by the plant manufacturer when operated with a capacity batch in accordance with the method regularly employed in operation of the plant or in the time designated in CAN CSA A23.1.

The concrete is considered uniform if it meets the requirements of CAN CSA A23.1-14, Table 13 and sampled in accordance with clause 3.4 of CSA A23.2-1C.

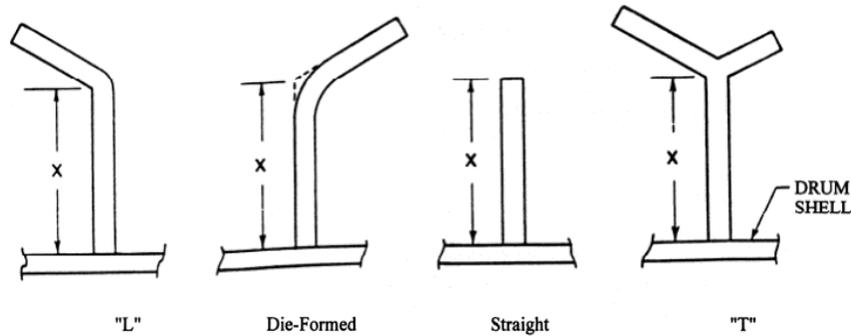
Engineer Initials \_\_\_\_\_

- B.6.c The plant is equipped with a timing device that will not permit the batch to be discharged before the predetermined mixing time has elapsed.

**B.7 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:

- B.7.a Truck mixers adequately maintained, with the amount of blade wear in each mixer, measured as the total cross section length of the blades at the point of maximum drum diameter nearest the drumhead, being less than 10%. Where comprehensive truck mixer records are maintained the examining engineer may waive the actual measurement of the blades if the records show that the mixer has delivered less than 10,000 m<sup>3</sup> of concrete.



- B.7.b Charging and discharge openings and chute in good condition, free from appreciable accumulations of cement or concrete with hopper and chute surfaces clean and smooth.
- B.7.c Drum of such size that the rating as a mixer – in volume of mixed concrete – does not exceed 63% of the gross volume of the mixer, disregarding the blades. (This requirement is met, if all mixers carry a rating plate of the Truck Mixer Manufacturer's Bureau.)
- B.7.d Provided with documentation showing the mixer manufacturer's recommended operating speed for mixing which must be in the range of 6 to 18 rpm of the drum; demonstrated capabilities to operate satisfactorily at recommended speed.

Engineer Initials \_\_\_\_\_



**B.8 Agitators**

Definition: Drums or containers, mounted on trucks or other vehicles in which central mixed concrete is kept sufficiently in motion during delivery to prevent segregation.

**B.8.a** Each acceptable agitator shall conform with the requirements of section B.7, Truck Mixers, except that the drum or container must be of such size that the ratings as an agitator (in volume of mixed concrete) does not exceed 80% of the gross volume of the container, disregarding blades. All units carrying a rating plate of the Truck Mixer Manufacturer's Bureau meet this requirement.

The recommended operating speed for agitating must be in the range of not less than 2 rpm nor more than 6 rpm, with demonstrated capability to operate at recommended speed.

**Note:** The inspecting engineer will evaluate all truck mixers and agitators used to deliver concrete from the plant. Any unit rated as unacceptable shall be **immediately** withdrawn from service and shall not be used again until its condition conforms to the above requirements.

**B.9 Ticketing System**

Provision on delivery tickets for the following information:

- Name and location of the batch plant;
- Date and serial number of the ticket;
- Name of the contractor (or other purchaser);
- Identification of the truck driver;
- Specific job designation (name and location);
- Specific class of exposure and mix identification of the concrete;
- Amount of concrete in cubic meters and cumulative total to the job;
- Truck number, cumulative total, and/or load number;
- Time stamped when loaded or time of first mixing of the cement and aggregate
- Ordered slump or slump flow and air content.

Engineer Initials \_\_\_\_\_

## REFERENCES

1. CAN CSA A23.1, *Concrete Materials and Methods of Concrete Construction* and CAN CSA A23.2, *Methods of Test and Standard Practices for Concrete*, Canadian Standards Association, 5060 Spectrum Way, Mississauga, ON L4W 5N6
2. Annual Book of ASTM Standards, Volume 04.02, Concrete and Aggregates, ASTM, 100 Barr Harbour Drive, West Conshohocken, PA 19428-2959
3. Concrete Plant Standards, CPMB 100-01, Twelfth Revision, August 2001, Concrete Plant Manufacturers Bureau, 900 Spring Street, Silver Spring, MA 20910
4. Truck Mixer, Agitator and Front Discharge Concrete Carrier Standards, TMMB 100-01, Truck Mixer Manufacturer's Bureau, 900 Spring Street, Silver Spring, MA 20910
5. Guide for Measuring, Mixing, Transporting, and Placing Concrete, ACI 304R-89, ACI Manual of Concrete Practice, Vol. 2, American Concrete Institute, P.O. Box 9094, Farmington Hills, MI 48333-9094
6. NRMCA Quality Control Manual – Section 3, Tenth Revision, 2009, Certification of Ready Mixed Concrete Production Facilities, National Ready Mixed Concrete Association, 900 Spring Street, Silver Spring, MA 20910
7. Certification of Concrete Production Facilities, Audit Checklist, November 2003, ARMCA, 9643A – 45<sup>th</sup> Avenue, Edmonton, AB T6E 5Z8
8. Ready Mix Concrete Production Facilities Certification Guide, January 2005, MRMCA, 169 Kingston Row, Winnipeg, MB R2M 0T1

**VERIFICATION OF INSPECTION AND APPLICATION FOR CERTIFICATE**

The undersigned, a registered Professional Engineer in the province of Saskatchewan and approved by Concrete Sask, has conducted the inspection of the ready-mixed concrete plant described as:

\_\_\_\_\_  
(Company Name)

\_\_\_\_\_  
(Plant and Location)

and assets that, in the undersigned's professional judgement, the information provided in the Checklist is accurate and complete. Application is hereby made for the issuance of a Certificate for this plant, 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 Materials |
| <input type="checkbox"/> Central Mixing       | <input type="checkbox"/> Semi-Automatic | <input type="checkbox"/> Aggregate              |
| <input type="checkbox"/> Shrink Mixing        | <input type="checkbox"/> Automatic      | <input type="checkbox"/> Water                  |
| <input type="checkbox"/> Seasonal Restriction |   | <input type="checkbox"/> Chemical Admixtures    |

\_\_\_\_\_  
(Inspection Date)

\_\_\_\_\_  
(Signature of Professional Engineer)

\_\_\_\_\_  
(Name, please print)

\_\_\_\_\_  
(Address)

\_\_\_\_\_  
(email address)

(seal)

**SCALE CHECKING AGREEMENT AND VOLUMETRIC BATCHING DEVICES AND DISPENSERS**

(To be completed by ready-mixed concrete company official)

The undersigned agrees that all scales in the plant described will be checked at intervals not exceeding those prescribed in clause B.1.c by an authority acceptable to Concrete Sask for conformance with sections B.1.b and B.1.c of the "Plant Certification Checklist". Any failure to meet the tolerance ( $\pm 0.20\%$  of scale capacity throughout the range of use) will be promptly corrected. If, for any reason, correction is delayed, the batch weights of any Concrete delivered will be adjusted to assure positively against a deficiency in unit cementitious content or an excess of water-cementitious ratio. The undersigned also agrees that the batching accuracy of all volumetric admixture dispensers and all volumetric water batching devices (including water meters) in the plant will be checked at intervals not exceeding 90 days for conformance with the batching accuracy requirements for liquid admixtures and water contained in items B.3.c and B.3.d of the checklist. Accuracy of devices for automated aggregate moisture measurement, when used, will be checked at intervals not exceeding 90 days (Item B.3.e). Any failure to meet the required batching accuracy will be corrected promptly. (Checks may be made by qualified company personnel, by outside agencies or by scale checking companies.)

Producer: \_\_\_\_\_

Per: \_\_\_\_\_

Name:

Title:

*I have the authority to bind the corporation*

\_\_\_\_\_

\_\_\_\_\_  
(Company address)

\_\_\_\_\_  
(Plant location)

\_\_\_\_\_  
(Plant description)

\_\_\_\_\_  
(Date)

Note:

Please allow Concrete Sask up to 30 days for processing and issuance of validation sticker.

**TRUCK MIXER FLEET MAINTENANCE AGREEMENT**

The undersigned agrees to inspect each unit in his/her truck mixer and agitator fleet at intervals not exceeding one year. Any unit not meeting the requirements of Clause D or E, as applicable, shall immediately be withdrawn from service and shall not be returned to service until it meets the requirements of this standard.

Producer: \_\_\_\_\_

Per: \_\_\_\_\_

Name:

Title:

*I have the authority to bind the corporation*

\_\_\_\_\_

\_\_\_\_\_  
(Company address)

\_\_\_\_\_  
(Plant location)

\_\_\_\_\_  
(Plant description)

\_\_\_\_\_  
(Date)

Note:

Please allow Concrete Sask up to 30 days for processing and issuance certificate or validation sticker.

**ACKNOWLEDGEMENT**

Capitalized terms in this Acknowledgment have the same meanings as set forth elsewhere within the Manual to which this Acknowledgment is attached.

The Applicant agrees as follows:

1. to comply with all requirements of the Applicant that are contained in this Manual, under the Program, and within the Ancillary Documents.
2. to abide by decisions of Concrete Sask concerning any failure by the Applicant to comply with any requirements of the Applicant that are contained in this Manual, under the Program, and within the Ancillary Documents.

Producer: \_\_\_\_\_

Per: \_\_\_\_\_

Name:

Title:

*I have the authority to bind the corporation*

\_\_\_\_\_

\_\_\_\_\_  
(Company address)

\_\_\_\_\_  
(Plant location)

\_\_\_\_\_  
(Plant description)

\_\_\_\_\_  
(Date)