

APPENDIX F

CHECKLIST FOR CONCRETE PRE-CONSTRUCTION CONFERENCE



Introduction

Pre-construction meetings are of prime importance in planning concrete construction work because many potential problems can be avoided at the right time – before the start of the project when the cost impact is relatively low.

In 1999, the National Ready Mixed Concrete Association (NRMCA) and the American Society of Concrete Contractors (ASCC) joined in a partnership to enhance the quality of concrete construction. This checklist is one of the ongoing initiatives of the partnership.

With permission of the original author, the Ready Mixed Concrete Association of Ontario (RMCAO) and the Ontario General Contractors Association (OGCA) have reviewed and revised this document for use on Canadian construction projects following the requirements of the most recent CSA A23.1/2 Standard.

The checklist allocates responsibilities and establishes procedures related to concrete construction – sub-grade preparation, forming, concrete mix design, necessary equipment, ordering and scheduling materials and operations, placing, consolidating, finishing, jointing, curing and protection, testing and acceptance, as well as safety and environmental issues.

The checklist covers some of the issues that need to be discussed at a pre-construction meeting and is not intended to be all-inclusive.

This checklist is meant to be a guide and is not intended to address all safety issues. Please operate safely and within all the legislations in your area



INDEX

PAGE

48	A. Project Information
49	B. Construction Process
56	C. Concrete Requirements
60	D. Ordering and Scheduling Concrete
61	E. Environmental Aspects
62	F. Quality Control/Assurance
65	G. Safety

References

Canadian Standards Association

CSA A23.1

CSA A23.2

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SAMPLE CHECKLIST FOR THE CONCRETE PRE-CONSTRUCTION CONFERENCE

A. Project Information

1. Project name _____
2. Location _____
3. Project start date _____
4. Project completion date _____
5. Project participants
Contact _____
Owner _____
Architect _____
Structural Engineer _____
Construction Manager/General Contractor _____
Concrete Contractor _____
Concrete Supplier _____
Concrete Pumping Contractor _____
Concrete Finisher _____
Testing Laboratory _____
Inspection Agency _____
Other _____
6. Background information about the project

7. Unique features of the project

8. Distribution of completed checklist
Project Participants _____
Others _____

B. Construction Process

1. Review notes and changes on drawings that may affect construction process

2. Sequence of construction and milestone dates

Foundations _____

Walls _____

Structural slabs _____

Slab-on-grade interior _____

Slab-on-grade exterior _____

3. Construction/acceptance of base/subgrade, compaction, elevation. Responsibility for:

Providing base and subgrade elevations to contractors

Stability of the base and or subgrade under construction traffic

Protecting the base and/or subgrade from water damage

Compacting and final grading of the base and subgrade after all plumbing installations are complete

Location of electrical lines (conduit)

In subgrade trenched and backfilled with rock _____

In rock subgrade _____

Protection from truck traffic if required _____

4. Responsibility for site access roads and their maintenance

5. Responsibility for available space for pumping operations if required

Access for two trucks to pump, one on each side _____

Staging area for testing and slump adjustment _____

6. Person responsible for directing trucks to pump or placement area _____

7. Responsibility for directing/backing up trucks _____

8. Responsibility for power, lighting, water, and water pressure during placing and finishing

9. Responsibility for controlling the ambient temperatures (subgrade, forms, and air)

10. Forms

Form sizes, types _____

Lifting equipment required _____

Form materials, accessories _____

Review location of reinforcement, embedded items, waterstops, drains, openings, openings for frames, etc.

Scheduling form erection and removal correlated to reinforcing and concreting operations

Responsibility for installation and inspection

Reinforcement _____

Embedded items _____

Waterstops _____

Drains _____

Opening frames _____

Responsibility for form inspections

Preliminary – prior to rebar placement _____

Semifinal – with rebars, embedded items, waterstops and drains _____

Note: Reinforcement inspection must include:
 Location and spacing to allow access for vibration equipment and proper coverage
 Spacing of reinforcement in relation to aggregate size

Final – before placing concrete _____

11. Vapor retarder or vapor barrier membrane

Type of membrane _____

Location of membrane relative to subgrade _____

Effect on curling _____

Effect on bonding of applied floor coverings _____

Basis of acceptance for installation of moisture sensitive flooring materials (wood, carpet, tiles) on the slab

Moisture emission requirements for flooring materials to be installed

Responsibility for

Testing and reporting of the test results _____

Acceptance of the slab _____

12. Placing concrete: equipment and procedures

Deposit from truck _____

Buggy _____

Belt conveyor _____

Bucket placement _____

Pumping _____

Other _____

13. Consolidation of concrete: equipment and procedures

Vibrators _____

Vibratory screeds (surface vibrators) _____

Back up equipment _____

Power source _____

Other _____

14. Responsibility for inspection of placing and consolidation of concrete _____

15. Ventilation in enclosed spaces

Type of test required _____

Responsibility for ventilation:

During placement _____

During finishing _____

16. Strike off technique

Hand strike off _____
 Vibratory screed _____
 Laser screed _____
 Other _____

17. Finishing

Types of finishes

- Area 1 _____
- Area 2 _____
- Area 3 _____
- Area 4 _____

Special materials for finishes _____

Dry-shake hardener

Rate of application _____

Procedure to install _____

Tools and equipment required _____

Back up tools and equipment required _____

18. Specified tolerances for

Vertical concrete surfaces:

Plumbness _____

Dimensions _____

Thickness _____

Texture _____

Colour _____

Acceptable variances _____

Surface defects _____

Others _____

Slabs-on-grade and floors

Flatness/levelness _____

Dimensions _____

Thickness _____

Texture _____

Colour _____

Acceptable variances _____

Surface defects _____

CHECKLIST FOR CONCRETE PRE-CONSTRUCTION CONFERENCE

Joint spacing _____

Others _____

Elevated slabs

Flatness/levelness _____

Dimensions _____

Thickness _____

How it will be determined _____

Texture _____

Colour _____

Acceptable variances _____

Surface defects _____

Others _____

Procedures for measuring tolerances (when and how)

Review specifications for possible conflict between the concrete installer and other trades

Review specifications for conflict between the surface profile provided by the concrete installer and the surface profile required by installer of finished material

Responsibility for

Reporting F-numbers to concrete contractor _____

Accepting floors _____

Measuring tolerances _____

Repairing "air or bug holes" in vertical surfaces _____

Removing curing compounds prior to application of sealers _____

19. Jointing

Review/verification of contraction, isolation, and construction joint layout plans

Structures (walls) Yes No

Comments (number, location, spacing, details) _____

Slabs-on-grade Yes No

Comments (number, location, spacing, details) _____

CHECKLIST FOR CONCRETE PRE-CONSTRUCTION CONFERENCE

Type of joints contraction isolation construction

Formed joints _____

Tooled joints _____

Early entry saw-cut

Timing _____

Depth of cut _____

Joint spacing _____

Equipment _____

Conventional saw-cut

Timing _____

Depth of cut _____

Joint spacing _____

Equipment _____

20. Slabs-on-grade

Joints Yes No

Reinforcement Yes No

Position of reinforcement in slab _____

Method of supporting reinforcement at specified elevation _____

Termination at joints _____

Load transfer devices (e.g. dowel bars) _____

Type, size, and location _____

Check for specified alignment _____

Define unacceptable cracks (see surface defects in tolerances) _____

Method of repair of unacceptable cracks _____

Responsibility for repair of unacceptable cracks _____

Sealing (filling) joints Yes No

Epoxy joint filler Yes No

Elastomeric sealant Yes No

Timing (review product directions and ACI Guidelines) _____

Depth of filling _____

Procedure (flush or slightly crowned for epoxy joint or concave for Elastomeric sealant)

Responsibility for future touch up _____

21. Curing and Sealing

Curing methods _____

Curing periods _____

Responsibility for curing floors placed prior to erection of roof, walls

Temperature Control Yes No

Specify _____

If temporary heaters are used, responsibility for venting to prevent concrete dusting

Excessive evaporation control

Specify _____

Evaporation retarder Yes No

Specify _____

Fogging Yes No

Specify _____

Other _____

Responsibility for inspection of curing operations/timing

Responsibility for removing curing compounds

Applying sealers

Types _____

Locations _____

22. Protection of concrete

Roof and walls Yes No

Specify _____

Floors coverings Yes No

Specify _____

Floor protection Yes No

Specify age/strength of floor prior to the use of floor by

Foot traffic _____

Pneumatic tire traffic _____

Hard wheel traffic _____

Construction traffic _____

Specify age/strength of floor when

Equipment is installed _____

Racks are erected _____

23. Responsibility for storage areas and site security

24. Form removal

What is the minimum strength requirement for form removal? _____ MPa

What formal report is required before form removal?

Type of field or in-place strength tests (if used) and evaluation criteria?

Name(s) of personnel authorized to approve form removal

25. Procedures for hot weather concreting

26. Procedures for cold weather concreting

C. Concrete Requirements

1. Concrete mix designations

All concrete materials and supply shall conform to CSA A23.1

2. Concrete mix designs submittal

Have mix submissions been received Yes No

Prescriptive requirements Yes No

Performance requirements Yes No

Comments: _____

Copies of the mix submittal provided to

Owner Yes No

Architect Yes No

Structural engineer Yes No

CHECKLIST FOR CONCRETE PRE-CONSTRUCTION CONFERENCE

- | | | |
|--|------------------------------|-----------------------------|
| Construction manager or general contractor | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Concrete contractor | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Concrete pumping contractor | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Concrete finisher | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Testing laboratory | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Inspection agency | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

3. Additional mix designs required Yes No

Specify _____

4. Consideration for aggregates other than CSA – prescriptive specification only

Gradation _____

- | | | |
|-------------------|------------------------------|-----------------------------|
| Sand requirements | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
|-------------------|------------------------------|-----------------------------|

5. Pumped concrete Yes No

6. High early strength Yes No Strength required _____ MPa at age _____

7. Lightweight concrete Yes No

8. Other Yes No

Comments _____

9. Concrete supply

- | | | |
|---|------------------------------|--|
| RMCAO Production Facility Certification receive | <input type="checkbox"/> Yes | <input type="checkbox"/> No – do not proceed with supply |
|---|------------------------------|--|

Primary Plant _____ Backup Plant _____

Plant Contacts _____ Phone Number _____

Revolutions or time limits for mixing concrete _____

Note: Refer to CSA A23.1

10. Review project specifications for conflicts in performance requirements (compressive/flexural strength, durability, shrinkage, curling and water-cementitious materials ratio, water content, slump, air content)

11. Other performance ingredient materials required

- | | | |
|------------------------------------|------------------------------|-----------------------------|
| Mid range water reducing admixture | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
|------------------------------------|------------------------------|-----------------------------|

- | | | |
|-------------------------------------|------------------------------|-----------------------------|
| High range water reducing admixture | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
|-------------------------------------|------------------------------|-----------------------------|

- | | | |
|--------------------------|------------------------------|-----------------------------|
| Non-chloride accelerator | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
|--------------------------|------------------------------|-----------------------------|

- | | | |
|----------------------|------------------------------|-----------------------------|
| Corrosion inhibitors | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
|----------------------|------------------------------|-----------------------------|

- | | | |
|---------|------------------------------|-----------------------------|
| Fly ash | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
|---------|------------------------------|-----------------------------|

- | | | |
|-----------|------------------------------|-----------------------------|
| GGBF slag | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
|-----------|------------------------------|-----------------------------|

- | | | |
|-------------|------------------------------|-----------------------------|
| Silica fume | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Fibres | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Colour | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Other | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Note 1: *Batching all ingredient materials at the plant ensures best quality control of concrete. Jobsite modifications to mixture shall be documented on the delivery tickets.*

Note 2: *Add appendices with the approved concrete mix design submittals*

12. Project specification requirements for air content

Normal weight air-entrained concrete (not recommended if floors require a machine troweled finish, but recommended for all exterior work)

Comments _____

Are adjustments to air content allowed on the jobsite Yes No

Comments _____

Air-entrained lightweight concrete for interior slabs

Comments _____

Other requirements

Comments _____

13. Project specification requirements for slump limits

Conventional concrete Max. _____ Min. _____

Pumped concrete Max. _____ Min. _____

Comments _____

Plasticized concrete Max. _____ Min. _____

Comments _____

Other: Max. _____ Min. _____

Comments _____

14. Jobsite slump adjustments

Responsibility for:

Making/permitting jobsite slump adjustments _____

Recording of adjusted batch _____

Materials permitted to adjust the slump:

Water

Mid-range water reducer

High-range water reducer

Procedure to be followed and limitations that apply to jobsite slump adjustment (maximum amount, subsequent mixing, sampling of the load) _____

15. Project specification requirements for temperature

Required temperature of concrete as delivered:

Max: _____ °C Min: _____ °C

Responsible person for requiring and approving special measures to meet concrete temperatures such as hot water, heated aggregate, cold water, ice, liquid nitrogen

Outline procedure to be followed and limitations that apply for measurement of concrete temperature and acceptance of concrete at the jobsite

16. Project specification requirements for concrete delivery time – 120 minutes as per CSA A23.1/.2

Other _____

17. Project specification requirements for lightweight concrete

Maximum unit weight _____

Slump _____

Air content _____

Pumping operations _____

18. Architectural concrete

Finish details

Location

Exposed aggregate _____

Smooth finish _____

Rubbed finish _____

Colored _____

Imprinted _____

Details (grouted joints, textured)

Special materials

Cement _____

Aggregates _____

Water _____

Admixtures _____

Sealers _____

Release agents _____

Architectural samples or mockups

Location _____

Preservation _____

Responsibility for acceptance _____

Repair methods _____

D. Ordering and Scheduling Concrete

- 1. Person(s) responsible for ordering concrete (concrete must be ordered by mix design code)

- 2. Minimum time notice required for most placements

- 3. Define large and specialty orders

- 4. Minimum notice required for large and specialty placements

- 5. Procedure for handling will call orders

- 6. Procedure for handling revised orders

- 7. Contact name(s) and phone number(s) for last-minute cancellations

Supplier _____

Concrete contractor _____

Construction manager or general contractor _____

- 8. Person on jobsite responsible for reviewing delivery ticket prior to placement

CHECKLIST FOR CONCRETE PRE-CONSTRUCTION CONFERENCE

9. Regular hours are between _____ am and _____ pm
Regular workdays are _____ through _____ not including
designated holidays

10. Are there any anticipated holiday and/or overtime placements? Yes No
Comments _____

11. Delivery schedules

Location of placement _____

Anticipated placement sizes _____ cubic metres

Minimum load size _____ cubic metres

What are anticipated placement rates? _____ cubic metres/hour

Approximate placements dates _____

Inclement weather plant capability _____

12. Concrete delivery

Acceptance/rejection responsibility _____

Any traffic restrictions at or near the jobsite Yes No

Comments _____

Any restrictions on entrance to or exits from jobsite Yes No

Comments _____

Other Items

Comments _____

13. Trucks:

Number of trucks _____

Interval schedule (turn around time) _____

E. Environmental Aspects

1. Environmentally sensitive areas around the project: Yes No
Comments _____

2. Contractor identified concrete wash out area at the jobsite _____

3. Responsibility for clean up of the wash out areas _____

4. Person responsible for directing trucks to the wash out area _____

5. Are spill response kits available on site? Yes No
Comments _____

6. On-site emergency contact person _____

7. Responsibility for disposal of curing compounds _____

8. Other items _____

F. Quality Control/Assurance

1. CSA/CCIL Accreditation requirements for laboratory _____
2. Certification requirements for
Laboratory testing technicians name(s)
CSA Concrete Laboratory Testing Technician _____
Field testing technicians name(s)
ACI Grade I Certified _____
CSA Certified Concrete Tester _____
CCIL Type J Certified Concrete Tester _____
3. Advance notice for scheduling testing personnel _____
4. Procedures for verification of specified requirements
Strength tests _____
Other _____

F.1. Concrete Sampling and Testing Requirements

1. Sampling frequency _____
2. Sampling location
Point of discharge _____
Point of placement _____
Comments (agreement on sampling location) _____
3. Tests performed on each sample
Slump _____
Temperature _____
Density (unit weight) _____
Air content _____
Compressive strength _____
Flexural strength _____
Other _____
4. Cylinder size for compressive strength test
 100X200 mm 150x300 mm
5. Beam size for flexural strength test
 150X150 mm Length: refer to CSA A23.2 – 3C
 Other size _____

Note: If beam breaks are low, compare acceptable concrete with suspect concrete by coring

6. Number of cylinders per sample _____
(hardened cylinder weight must be recorded on concrete strength reports)
7. Number of beams per sample _____
8. Number of cylinders/beams to be cured _____ Field? _____ Lab? _____
9. At what ages are cylinders/beams to be tested? _____
10. Number of cylinders/beams per test (minimum 2) _____
11. Are reserve cylinders/beams required? Yes No How many? _____
12. Frequency of yield tests and compliance checks (three-load average of unit weight)

F.2. Test Cylinder Storage and Transportation

1. As per CSA A23.2

F.3. Acceptance/Rejection of Fresh Concrete

1. Who has the authority to accept/reject a concrete delivery?

Note: A second person may be designated as having the authority for FINAL rejection of a concrete delivery

2. What criteria will be used to reject concrete?

Slump _____
 Air content _____
 Unit weight _____
 Temperature _____
 Time limit _____
 Other _____

3. Are re-tests allowed before rejection? Yes No

Procedure _____

F.4. Acceptance Criteria for Hardened Concrete

1. Review acceptance criteria

Other _____

F.5. Distribution of Test Reports (to all participants)

1. CMATS™ shall be used for project

Note: Concrete supplier and concrete contractor must receive reports directly and immediately from the laboratory to allow timely response to any deficiencies.

2. Early age test result strength requirements

Anticipated concrete strength for earlier age breaks: _____ / _____ (% specified strength/days)

F.6. Testing of Hardened In-Place Concrete

1. In what situations will additional (or referee) testing be required?

Running average of three consecutive strength tests is less than specified – CSA A23.1

Other _____

2. Procedure(s) to be followed for evaluation of low-strength tests

Evaluation of test results and testing procedures – including laboratory operations

Comments _____

Non-destructive testing

Penetration probe in accordance with ASTM C 803

Rebound hammer in accordance with ASTM C 805

Other (combined method) _____

Note: Refer to ACI 228.1R

Evaluation of structural adequacy of questionable sections by the structural engineer

Core testing and evaluation in accordance with CSA A23.1

Procedure for conditioning cores prior to testing _____

Load testing in accordance with CSA A23.1

Other _____

Remove and replace

Comments _____

3. How do the project specifications handle additional testing? _____

If additional testing is required, _____ will notify the following parties

4. What investigative procedures will be used?

5. Who will be employed to conduct additional testing and who employs them?

6. How will the test results be evaluated?

7. Who will pay the costs of additional testing?

Specified strength confirmed _____

Specified strength not confirmed _____

G. Safety

1. Personal protective equipment required:

Hard hats Yes No

Safety boots Yes No

Eye protection Yes No

Safety vests Yes No

Specific protective clothing Yes No

Respirators Yes No

Other _____

2. Responsibility for

First aid supplies _____

Providing and maintaining information such as Material Safety Data Sheets (MSDS) and Spills Response

Plans at the jobsite _____

Job site Ingress and Egress _____

Fall protection _____

Safety inspections _____

Signalers _____

Safety meetings _____

3. Emergency contacts _____