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20 PERSONNEL QUALIFICATIONS AND CERTIFICATIONS

20.1 GENERAL

20.1.1 Scope

- 1 The qualification requirements given in this part are optional unless otherwise mentioned below. The purpose of the qualifications is to prepare the industry to cope with the required quality of construction. The requirements will become compulsory if they are mentioned in the contract or requested by the engineer.
- 2 Qualifications shall be approved by Qatar Standards or their representatives.

20.1.2 References

ASTM C1064/C1064M... Temperature of freshly mixed hydraulic-cement concrete
ASTM C1611/C1611M... Standard test method for slump flow of self consolidating concrete
ASTM C566 – Method of determination of moisture content
EN 1097-3 Aggregates – Determination of loose bulk density and voids
EN 1097-6 Aggregates – Determination of particle density and water absorption
EN 12350-1 Testing fresh concrete - Sampling
EN 12350-2 Testing fresh concrete – Slump test
EN 12350-6 Testing fresh concrete – Density
EN 12350-7 Testing fresh concrete – Air content (Pressure Method)
EN 12390-2 Testing hardened concrete – Making and curing specimens for strength tests
EN 12390-3 Testing hardened concrete - Compressive strength of test specimens
EN 932-1 Aggregates - Methods of sampling
EN 932-2 Aggregates – Methods of reducing laboratory samples
EN 933-1 Aggregates – Determination of particle size distribution (and dust content)

20.2 AUDITORS

- 1 Qatar Standards auditors and their approved representatives shall be qualified for inspecting concrete ready mix plants and testing laboratories.

20.3 READY MIXED CONCRETE COMPANIES

20.3.1 Technical Department

- 1 **Position:** Technical Manager / QC Manager

Qualifications:

- (a) Concrete specification review and concrete mixture proportioning
- (b) Concrete constituent materials, their characteristics, and effects on concrete properties
- (c) Fresh and hardened concrete properties
- (d) Durability of concrete
- (e) Production and delivery of Ready Mixed Concrete
- (f) Handling, placing and curing of concrete
- (g) Specifying and evaluation of concrete strength
- (h) Testing of concrete and its constituents

- (i) Quality control procedures and statistical analysis
- (j) Hot weather concreting
- (k) Troubleshooting concrete problems

2 **Position:** Site Supervisor

Qualifications:

- (a) The supervisor shall be capable of satisfactorily reading, understanding and performing the below fresh concrete tests:

ASTM C1064/C1064M- Temperature of freshly mixed hydraulic-cement concrete
ASTM C1611/C1611M- Standard test method for slump flow of self consolidating concrete
EN 12350-1Testing fresh concrete - Sampling
EN 12350-2Testing fresh concrete – Slump test
EN 12350-6Testing fresh concrete – Density
EN 12390-2Testing hardened concrete – Making and curing specimens for strength tests

3 **Position:** Lab Supervisor

Qualifications:

- (a) The supervisor shall be capable of satisfactorily reading, understanding and performing the below fresh and hardened concrete tests:

ASTM C1064/C1064M Temperature of freshly mixed hydraulic-cement concrete
ASTM C1611/C1611M Standard test method for slump flow of self consolidating concrete
ASTM C566 –Method of determination of moisture content
EN 932-2Aggregates – Methods of reducing laboratory samples
EN 932-1Aggregates - Methods of sampling
EN 933-1Aggregates – Determination of particle size distribution (and dust content)
EN 1097-6Aggregates – Determination of particle density and water absorption
EN 1097-3Aggregates – Determination of loose bulk density and voids
EN 12350-7Testing fresh concrete – Air content (Pressure Method)
EN 12350-6Testing fresh concrete – Density
EN 12350-2Testing fresh concrete – Slump test
EN 12350-1Testing fresh concrete - Sampling
EN 12390-3Testing hardened concrete - Compressive strength of test specimens
EN 12390-2Testing hardened concrete – Making and curing specimens for strength tests

4 **Position:** Site Technician (compulsory if requested by the Engineer)

Qualifications:

- (a) The technician shall be capable of satisfactorily performing the below fresh concrete tests:

ASTM C1064/C1064M Temperature of freshly mixed hydraulic-cement concrete
ASTM C1611/C1611M Standard test method for slump flow of self consolidating concrete
EN 12350-1Testing fresh concrete - Sampling
EN 12350-2Testing fresh concrete – Slump test
EN 12350-6Testing fresh concrete – Density
EN 12390-2Testing hardened concrete – Making and curing specimens for strength tests

5 **Position:** Lab Technician (compulsory if requested by the Engineer)

Qualifications:

(a) The technician shall be capable of satisfactorily performing the below fresh and hardened concrete tests:

ASTM C1064/C1064M Temperature of freshly mixed hydraulic-cement concrete
ASTM C1611/C1611M Standard test method for slump flow of self consolidating concrete
ASTM C566 –Method of determination of moisture content
EN 932-2Aggregates – Methods of reducing laboratory samples
EN 932-1Aggregates - Methods of sampling
EN 933-1Aggregates – Determination of particle size distribution (and dust content)
EN 1097-6Aggregates – Determination of particle density and water absorption
EN 1097-3Aggregates – Determination of loose bulk density and voids
EN 12350-7Testing fresh concrete – Air content (Pressure Method)
EN 12350-6Testing fresh concrete – Density
EN 12350-2Testing fresh concrete – Slump test
EN 12350-1Testing fresh concrete - Sampling
EN 12390-3Testing hardened concrete - Compressive strength of test specimens
EN 12390-2Testing hardened concrete – Making and curing specimens for strength tests

20.3.2 Production and Operation Department

1 **Position:** Plant/Production/Operation Manager and/or Supervisor

Qualifications:

- (a) Properties of concrete and its constituents
- (b) Materials management
- (c) Plant design, function and maintenance
- (d) Batching operations, procedures and dispatching
- (e) Materials management and inventory
- (f) Safety regulations and procedures

2 **Position:** Plant Operator

Qualifications:

- (a) Basic concrete properties and characteristics of its constituents
- (b) Scales, meters and batching sequence and control system
- (c) Central mixing and discharging

- (d) Tolerances, overweight/underweight controls
- (e) Troubleshooting scales, gates and other plant components
- (f) Safety procedures

20.4 TESTING LABORATORIES

20.4.1 Concrete Laboratory Department

- 1 **Position:** Laboratory Manager / QC Manager

Qualifications:

- (a) Concrete specification review and concrete mixture proportioning
- (b) Concrete constituent materials, their characteristics, and effects on concrete properties
- (c) Fresh and hardened concrete properties
- (d) Durability of concrete
- (e) Production and delivery of Ready Mixed Concrete
- (f) Handling, placing and curing of concrete
- (g) Evaluation of concrete strength
- (h) Testing of concrete and its constituents
- (i) Quality control procedures and statistical analysis
- (j) Hot weather concreting
- (k) Troubleshooting concrete problems

- 2 **Position:** Supervisor

Qualifications:

- (a) The supervisor shall be capable of satisfactorily reading, understanding and performing the below fresh and hardened concrete tests:

ASTM C1064/C1064M Temperature of freshly mixed hydraulic-cement concrete

ASTM C1611/C1611M Standard test method for slump flow of self consolidating concrete

ASTM C566 –Method of determination of moisture content

EN 932-2Aggregates – Methods of reducing laboratory samples

EN 932-1Aggregates - Methods of sampling

EN 933-1Aggregates – Determination of particle size distribution (and dust content)

EN 1097-6Aggregates – Determination of particle density and water absorption

EN 1097-3Aggregates – Determination of loose bulk density and voids

EN 12350-7Testing fresh concrete – Air content (Pressure Method)

EN 12350-6Testing fresh concrete – Density

EN 12350-2Testing fresh concrete – Slump test

EN 12350-1Testing fresh concrete - Sampling

EN 12390-3Testing hardened concrete - Compressive strength of test specimens

EN 12390-2Testing hardened concrete – Making and curing specimens for strength tests

3 **Position:** Technician (compulsory if requested by the Engineer)

Qualifications:

- (a) The technician shall be capable of satisfactorily performing the below fresh and hardened concrete tests:

EN 12350-1Testing fresh concrete - Sampling
ASTM C1064/C1064M Temperature of freshly mixed hydraulic-cement concrete
EN 12350-2Testing fresh concrete – Slump test
EN 12350-6Testing fresh concrete – Density
EN 12350-7Testing fresh concrete – Air content (Pressure Method)
EN 12390-2Testing hardened concrete – Making and curing specimens for strength tests
ASTM C1611/C1611M Standard test method for slump flow of self consolidating concrete
EN 12390-3Testing hardened concrete - Compressive strength of test specimens
EN 932-1Aggregates - Methods of sampling
EN 932-2Aggregates – Methods of reducing laboratory samples
EN 933-1Aggregates – Determination of particle size distribution (and dust content)
EN 1097-6Aggregates – Determination of particle density and water absorption
EN 1097-3Aggregates – Determination of loose bulk density and voids
ASTM C566 –Method of determination of moisture content

20.5 CONTRACTORS

20.5.1 Concrete Construction Department

1 **Position:** Site Engineer

Qualifications:

- (a) The site engineer shall be capable of satisfactorily reading, understanding and performing the below fresh concrete tests:

EN 12350-1Testing fresh concrete - Sampling
ASTM C1064/C1064M Temperature of freshly mixed hydraulic-cement concrete
EN 12350-2Testing fresh concrete – Slump test
EN 12350-6Testing fresh concrete – Density
EN 12350-7Testing fresh concrete – Air content (Pressure Method)
EN 12390-2Testing hardened concrete – Making and curing specimens for strength tests
ASTM C1611/C1611M Standard test method for slump flow of self consolidating concrete

2 **Position:** QC Manager/ QC Engineer/ Material Engineer

Qualifications:

- (a) Concrete specification review and concrete mixture proportioning
(b) Concrete constituent materials, their characteristics, and effects on concrete properties
(c) Fresh and hardened concrete properties

- (d) Durability of concrete
- (e) Production and delivery of Ready Mixed Concrete
- (f) Handling, placing and curing of concrete
- (g) Specifying and evaluating of concrete strength
- (h) Testing of concrete and its constituents
- (i) Quality control procedures and statistical analysis
- (j) Hot weather concreting
- (k) Troubleshooting concrete problems

20.6 CONSULTANTS

20.6.1 Site Supervision Department

- 1 **Position:** Site Inspector/ Material Inspector

Qualifications:

- (a) The site engineer shall be capable of satisfactorily reading, understanding and performing the below fresh concrete tests:

EN 12350-1Testing fresh concrete - Sampling

ASTM C1064/C1064M Temperature of freshly mixed hydraulic-cement concrete

EN 12350-2Testing fresh concrete – Slump test

EN 12350-6Testing fresh concrete – Density

EN 12390-2Testing hardened concrete – Making and curing specimens for strength tests

ASTM C1611/C1611M Standard test method for slump flow of self consolidating concrete

20.6.2 Site Supervision / Design Office Department

- 1 **Position:** Material Engineer

Qualifications:

- (a) Concrete specification review and concrete mixture proportioning
- (b) Concrete constituent materials, their characteristics, and effects on concrete properties
- (c) Fresh and hardened concrete properties
- (d) Durability of concrete
- (e) Production and delivery of Ready Mixed Concrete
- (f) Handling, placing and curing of concrete
- (g) Specifying and evaluating of concrete strength
- (h) Testing of concrete and its constituents
- (i) Quality control procedures and statistical analysis
- (j) Hot weather concreting
- (k) Troubleshooting concrete problems

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