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		Rev: 01
		July 2016
KLM Technology Group #03-12 Block Aronia, Jalan Sri Perkasa 2 Taman Tampoi Utama 81200 Johor Bahru Malaysia	Plan and Reinforced Concert Specification (PROJECT STANDARDS AND SPECIFICATIONS)	

KLM Technology Group has developed; 1) Process Engineering Equipment Design Guidelines, 2) Equipment Design Software, 3) Project Engineering Standards and Specifications, and 4) Unit Operations Manuals. Each has many hours of engineering development.

KLM is providing the introduction to this guideline for free on the internet. Please go to our website to order the complete document.

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1.0 Scope

This Specification describes the technical requirements for proportioning, mixing, placing, testing, and curing of plain and reinforced concrete.

2.0 References

Applicable parts of the following specifications, industry codes and standards, and references shall be considered an integral part of this Specification. The edition in effect on the date of offer award shall be used, except as otherwise noted. Short titles are used herein where appropriate.

2.1 Industry Codes and Standards

American Concrete Institute (ACI)

- ACI 117 - *Standard Specifications for Tolerances for Concrete Construction and Materials*
- ACI 211.1 - *Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete*
- ACI 211.2 - *Standard Practice for Selecting Proportions for Structural Lightweight Concrete*
- ACI 301 - *Specifications for Structural Concrete*
- ACI 302.1R - *Guide for Concrete Floor and Slab Construction*
- ACI 304R - *Guide for Measuring, Mixing, Transporting, and Placing Concrete*
- ACI 304.2R - *Placing Concrete by Pumping Methods*
- ACI 305R - *Hot Weather Concreting*
- ACI 306R - *Cold Weather Concreting*
- ACI 306.1 - *Standard Specification for Cold Weather Concreting*
- ACI 308R - *Guide to Curing Concrete*
- ACI 309R - *Guide to Consolidation of Concrete*
- ACI 318 - *Building Code Requirements for Structural Concrete*
- ACI 347R - *Guide to Formwork for Concrete*
- ACI 504R - *Guide to Sealing Joints in Concrete Structures*
- ACI SP-66 - *ACI Detailing Manual*

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ASTM International (ASTM)

- ASTM A82 - *Standard Specification for Steel Wire, Plain, for Concrete Reinforcement (NTC 4002)*
- ASTM A185 - *Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete (NTC 1925)*
- ASTM A497 - *Standard Specification for Steel Welded Wire Reinforcement, Deformed for Concrete Reinforcement (NTC 2310)*
- ASTM A615 - *Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement(NTC 161)*
- ASTM A706 - *Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement (NTC 2289)*
- ASTM C31 - *Making & Curing of Concrete Test specimens in the Field (NTC 550)*
- ASTM C33 - *Standard Specification for Concrete Aggregates (NTC 174)*
- ASTM C39 - *Compressive Strength of Cylindrical Concrete Specimens (NTC 673)*
- ASTM C94 - *Standard Specification for Ready-Mixed Concrete (NTC 3318)*
- ASTM C143 - *Slump of Hydraulic Cement Concrete (NTC 396)*
- ASTM C150 - *Standard Specification for Portland Cement*
- ASTM C171 - *Standard Specification for Sheet Materials for Curing Concrete*
- ASTM C172 - *Sampling Freshly Mixed Concrete (NTC 454)*
- ASTM C173 - *Air Content of Freshly Mixed Concrete by Volumetric Method*
- ASTM C231 - *Air Content of Freshly Mixed Concrete by the Pressure Method*
- ASTM C260 – *Standard Spec. for Air-entraining admixtures for concrete (NTC 3502)*
- ASTM C309 - *Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete*
- ASTM C494 - *Standard Spec. for Chemical admixtures for concrete (NTC 1299)*
- ASTM C618 - *Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete (NTC 3493)*
- ASTM C685 - *Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing (NTC 4027)*
- ASTM C1012 - *Standard Test Method for Length Change of Hydraulic-Cement Mortars Exposed to Sulfate Solution*

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National Ready Mixed Concrete Association (NRMCA)

- *Quality Control Manual - Section 3, Certification of Ready Mixed Concrete Production Facilities – Plant Certification Check List.*

2.2 Government Regulations

U.S. Department of Labor, Occupational Safety and Health Administration (OSHA)

- OSHA 29 CFR 1926 - *Safety and Health Regulations for Construction.*

3.0 Definitions

offer documents: Any and all documents, including codes, studies, design drawings, specifications, sketches, practices, and data sheets, that engineer of record has transmitted or otherwise communicated, either by incorporation or reference.

engineer of record: Authorized representative with overall authority and responsibility for the engineering design, quality, and performance of the civil works, structure, foundations, materials, and appurtenances described in the offer documents. The engineer of record shall be licensed as defined by the laws of the locality in which the work is to be constructed, and be qualified to practice in the specialty discipline required for the work described in the offer documents.

manufacturer: The party who produces and warrants the performance of the (*products, materials and/or items*) provided in accordance with the offer documents. The (*products, materials and/or items*) shall:

- a. Be manufactured in a controlled process.
- b. Have standard codes, specifications, tests.
- c. Possibly include shop drawings to assist in proper application, installation and/or use.

Unless otherwise noted, the term manufacturer shall apply also to the manufacturer's sub-offerer(s) and/or vendor(s).

owner: The party who has authority through ownership, lease, or other legal agreement over the (*site, facility, structure or project*) wherein (*what is to be provided or installed*) will be used.