



# The Development of the QSPSC™ Certification in Hong Kong and Mainland



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# HCL Consulting Ltd.

HCL is established to provide the consulting services for the QSPSC™ certification from the HKQAA since 2001.

During this extensive experience for this kind of certification, I would like to share some practical experiences to the beginners who may find the useful of my working and consulting experiences.

In according to the QSPSC™ ~Quality Scheme for the Production and Supply of Concrete, as you may know that is published in 1991 by the HKQAA ~ the Hong Kong Quality Assurance Agency established since 1989.

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# What is QSPSC™?



- ◆ **Quality Scheme for the Production and Supply of Concrete (QSPSC™)**
- ◆ HKQAA published the Regulations in August 1991. The Works Bureau (Works Branch) via Technical Circular No. 3/94 dated 8 March 1994 endorsed the requirement specifying that producers supplying concrete to government projects in Hong Kong must be certified to QSPSC™. WBTC No. 3/94 was superseded on 1 January 2003 by a new requirement from the Environment Transport Works Bureau via Technical Circular (Works) No. 57/2002, which states:





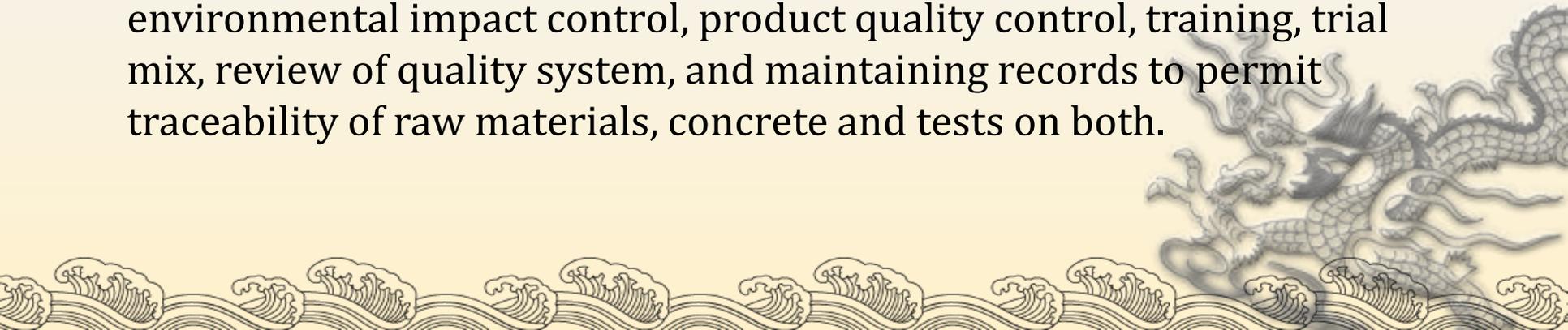
- ◆ Structural concrete for all public works contracts must be obtained from concrete suppliers who are certified under the QSPSC™, except for those located at remote areas (such as outlying islands) or where the volume of structural concrete involved is less than 50m<sup>3</sup>. Even for those “exceptional” projects, structural concrete should be obtained from a supplier operating a quality system approved by the Architect/Engineer.
- ◆ HKQAA is the only certification body accredited by both United Kingdom of Accreditation Services (UKAS) and Hong Kong Accreditation Services (HKAS) to issue QSPSC™ certificates.
- ◆ **Certification Standard**
- ◆ QSPSC™, administered by HKQAA, is a Product Certification Scheme that consists of two parts, i.e. Administrative Regulations and Technical Regulations.





## ◆ System and Testing Requirements

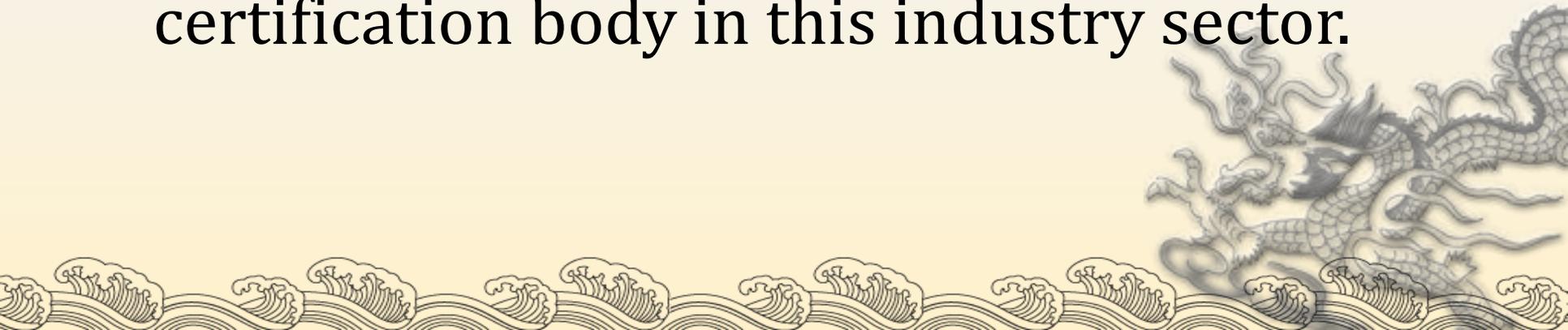
- ◆ The Scheme requires suppliers to operate in accordance with ISO 9001 requirements concurrently. All selected concrete sample must be subject to testing carried out by HOKLAS (Hong Kong Laboratory Accreditation Scheme) accredited laboratories. Test report issued by HOKLAS accredited laboratories shall be submitted to HKQAA for verification of compliance to the specification as a condition for granting certificate.
- ◆ Significant Processes under QSPSC™ planning to meet quality requirements including basis of supply, quality requirements, concrete mixes, design mixes and environmental impact, production including quality control of purchased materials, production control and environmental impact control, product quality control, training, trial mix, review of quality system, and maintaining records to permit traceability of raw materials, concrete and tests on both.



# Benefits of Certification

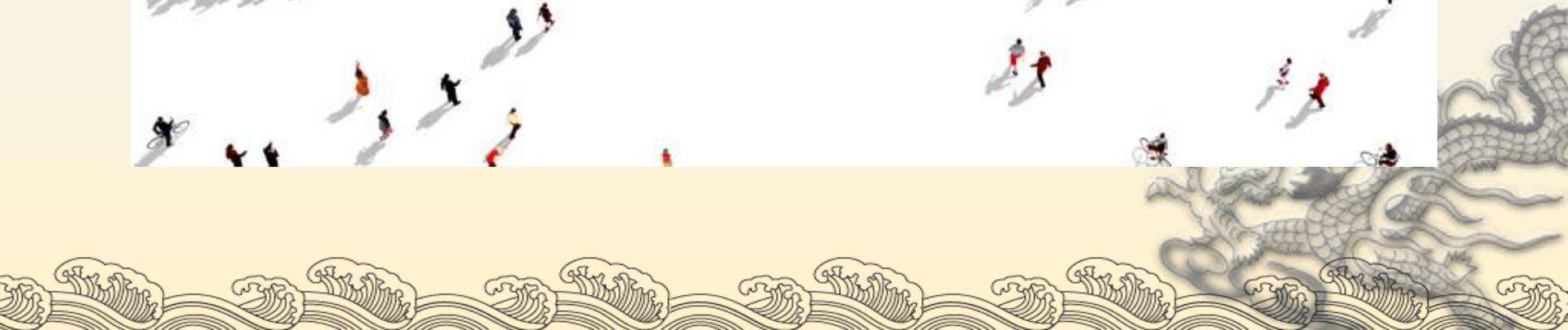


- ◆ Fulfills government contractual requirement.
- ◆ Demonstrates capability to deliver up-to-standard concrete.
- ◆ Differentiates concrete production facilities that have been assessed by the authoritative certification body in this industry sector.





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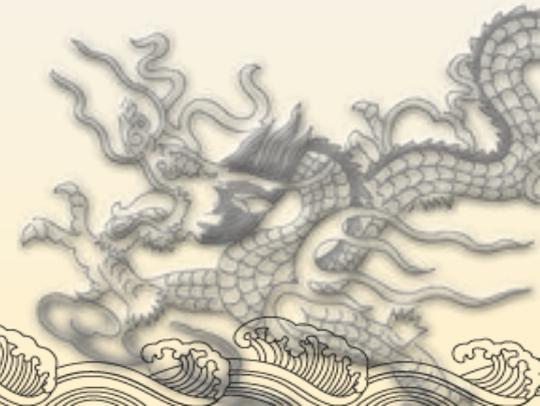


# From the past till now



In 1992, I was working as the assistant site engineer of the Sanfield Building Contractor Limited (the subsidiary of the Sun Hung Kei Properties Limited), I practised firstly this QSPSC™ to concrete supplier at the site batching plant called Glorious Concrete Limited(also subsidiary of the Sun Hung Kei Properties Limited) .

Every design concrete mix to the structure of the buildings and civil engineering works, I conducted the trial mixes and plant trial in accordance with the QSPSC™ and General Specifications for Civil Engineering works as well as the Building Regulations Chapter 123.





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# 1994



- ◆ while I was working as the project engineer of the Unicon Concrete Products Limited (a subsidiary of the ITC Group), I also practised this QSPSC™ to the precast factory where one batching plant with 0.5 cubic meter capacity of pan mixer was set up to supply ready mixed concrete for the production of precast facades, slabs, staircases and precast pipes and prestressed concrete sleepers for the KRC railway and others government projects.



- ◆ This was important to set up ISO 9001 QMS for the concrete batching plant before implementing the QSPSC™ system probably. The technical requirements of the QSPSC™ was the main part and must fully understand the clauses and technical knowledge. At that time, I designed and implemented the ISO 9001 and QSPSC™ for the batching plant and achieved the certification audit by the HKQAA successfully.



# The year of handover



After 1997, the new government launched a large public housing policy called 85000 flats target for 10 years and we had also designed to use precast concrete construction, so that this was a rapid growth of the precast factory about 20 in Hong Kong.

As I mentioned above, the precast factories were required to achieve ISO 9001 and the QSPSC to the batching plants. Due to the higher competition of suppliers there later on, some factories were moved and new factories were also set up in the mainland China in order to reduce the cost of labours and materials as well the facilities. At that period the QSPSC was then developed to the Shenzhen 深圳市, Dongguan 東莞市, Chungshan 中山市, Zhuhai 珠海市, Guangzhou 廣州市 within Guangdong 廣東 region.

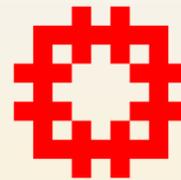




- ◆ In 1998, I was promoted to become the quality manager of the Dyna Concrete Limited (subsidiary of Guangdong Holdings Limited) that I managed the ISO 9001 and QSPSC™ for the production of precast facades and pipes mainly for HKHA and DSD projects. Besides, our company had one precast factory in Shenzhen.
- ◆ Normally most of factories had set up own laboratory with fully equipped testing and inspection equipment that can improve the planning and coordination of trail mixes and testing to meet clients requirements. Despite the different technical background between Hong Kong and Shenzhen, all staff including QC and technicians must understand the QSPSC™ requirements by my induction training regularly, otherwise this was unable to pass the audit and carried out testing and inspection successfully complied with the BS and CS 1 requirements



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# 2000s and afterwards



- ◆ In 2001, more China contractors were eager to set up their precast factory under QSPSC™ in mainland, not only this scheme was mandatory stated in the contracts and specifications but also they can upgrade the quality performance of Concrete eventually.
- ◆ In 2020, during the long period of consulting service particularly for QSPSC™, I had consulted to precast factories including some areas in 深圳市，東莞市，廣州市，惠州市，中山市，珠海市，武漢市及海南島。

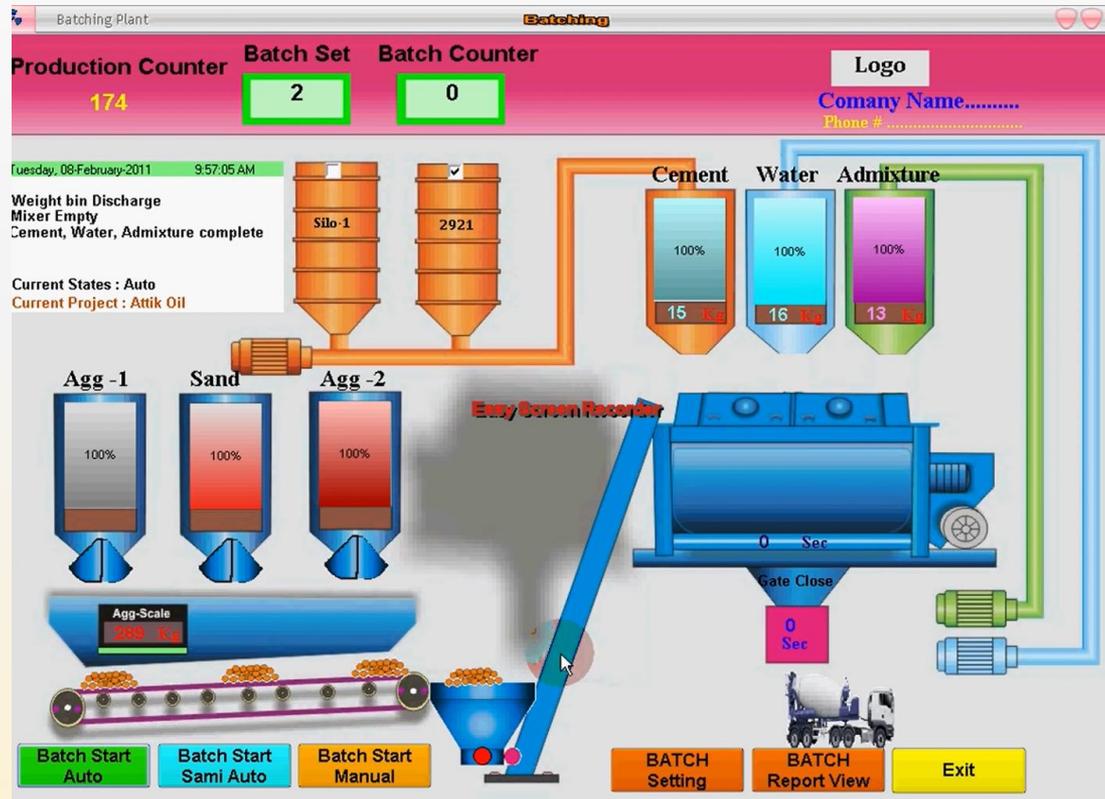


Of course, there were many technical and management issues during my consulting works





- 1. The concrete batching plant should be well equipped with computerized system for conveying, weighing and batching the Aggregate, Cement, Water and Admixtures with good control of tolerances for each parts, such as within 2% for cement, water and aggregate and within 5% for Admixtures.



- ◆ 2. The best practice was to set up the GPS to each agitators for traceability and identification in such a way to make sure the fresh concrete would be compacted within 2.5 hours after introduction of cement to the aggregates and within 30 minutes of discharge from the plant.



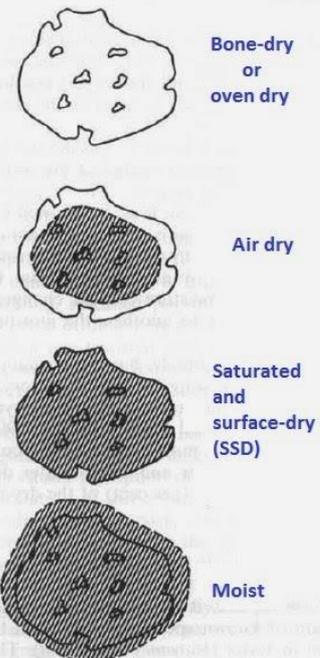
- ◆ 3. This was very important to make sure that all plant and equipment were maintained in a clean and efficient working condition and regular routine maintenance checks should be carried out.
- ◆ 4. The laboratory technician should carried out the moisture content of aggregates at the laboratory despite of moisture tester were installed for further comparison of the results.

$$MC = \frac{W_{stock} - W_{SSD}}{W_{SSD}} \times 100\%$$

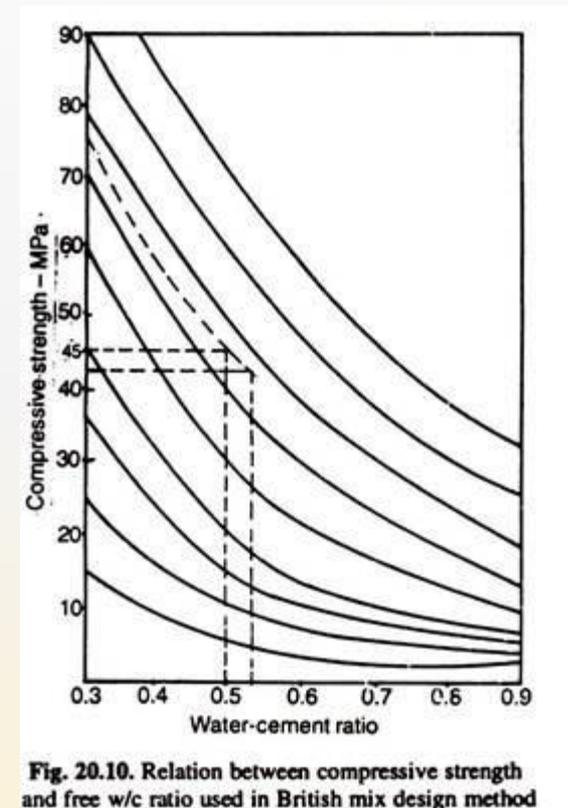
where: MC = moisture content expressed as a percentage

$W_{stock}$  = weight of aggregate in stockpile condition

$W_{SSD}$  = weight of aggregate in SSD condition



- ◆ 5. To make sure the changes of moisture content should be compensated in the mix proportions during the batching process through a computerized batching system by making necessary changes to the weight of aggregates and water to maintain the integrity of the agreed mix design and the w/c ratio.
  
- ◆ 6. To make sure plant operator who can calculate the changes of moisture content should be compensated in the mix proportions manually.



- ◆ 7. The plant operator should be trained up to able for good inspection to each load of the mixed concrete before discharge.
- ◆ 8. To make sure the laboratory technician to carry out all testing for concrete for control purposes should comply with the CS1.
- ◆ 9. This is also very important that the technician can carry out moisture content, slump test, cube making and testing, sieve analysis of aggregates in daily basis effectively and efficiently.



10. To conduct the internal audit to the ISO 9001 and testing of concrete were useful to improve the QSPSC™.





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THANK YOU!

