Future houses

built with

"KANDCRETE" future concrete, employing Nano-technology

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Consultant

Our goal:

We aim to reach concrete structures (low to medium rise)

resist harmful environmental factors :

Hot climates	Humidity	Coastal environment	Earthquake	Prone areas
Frost areas	Stormy areas	Noisy environment	Industrial environment	Weather fluctuation
	Rotting	Termite	Resonance	

Our goal:

We aim to reach concrete structures (low to medium rise)

characterized by :

- **High fire resistance (externally and internally)**
- **Higher structural balance rates & toughness**
- **Higher sustainability & durability rates**
- **Longer life cycle than its counterparts**
- **Locally produced – No significant increase in cost**

All these are achieved by using lightweight structural concrete that we called :

(KandCrete)

KANDCRETE definition:

It is a Structural Lightweight Concrete

(KandCret) could be considered as a ***combination of high performance concrete and structural lightweight concrete*** , and can do play constructive roles in enhancing the environment, meeting green-building objectives & attaining sustainable development. help achieve sustainable building solutions in many areas because of its advantages as : Reduction of dead load - Savings in Raw Material- Considerably Lower Weight - Thermal Insulation - Fire Protection - Sound Insulation - Economical Production - Self leveling / Self compacting – Self healing - does not rot and termite resistant - Speedier Constructions - Saving time & cost - Durability with lower maintenance costs - Disaster resistance - Seismic resistance - Indoor air quality : Negligible VOC emissions - Locally produced : The raw materials used to make the concrete production are abundant in most areas of the world - Minimal site disruption – high stability – high toughness – strong impermeability to prevent any external moisture or harmful material from entering the building.

KANDCRETE Properties:

GENERAL:

- (KandCrete) is the concrete of the future because with all these features we do not use any (unconventional) materials .
- It is composed of gravel, sand and cement (ordinary or resistive) have the same composition proportions as any conventional concrete.
- With addition we use Micro & Nano materials technology to get all of these advantages. Without a significant increase in cost.

Fresh Concrete : flowable – Pumpable - easy workability - no compaction necessary
Hardened Concrete : Adjustable in unit weight and strength , durable and stable in shape, Thermal insulating , higher resistance to fire, no increased shrinkage , not decomposable

"Kandcrete" in comparison with other materials.

- ecologically clean, "breathes".
- easy to produce in steady-state conditions as well as on a construction site.
- produced from components available in any region.
- its prime cost is low.

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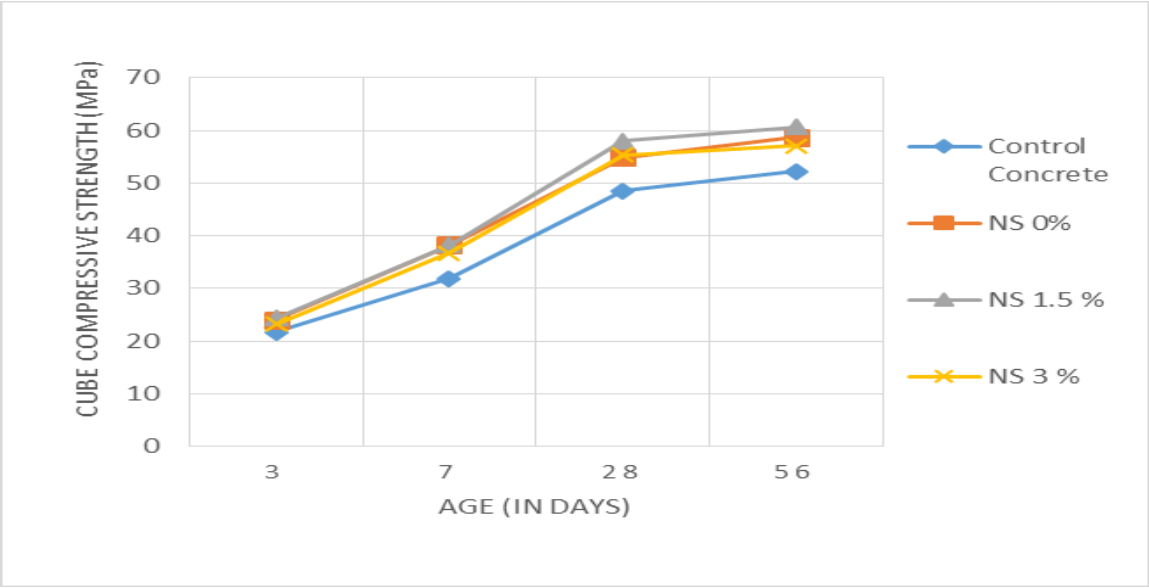
STRENGTH CONCRETE USING WITH NANO SILICA AND SILICA FUME



Variation of Cube Compressive Strength of M40 Grade Concrete with age for different percentages of Nano-Silica and 10% Micro-silica.

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Raw Materials

- Normal weight Aggregate (natural sand – natural gravel)
- Cement, preference Ordinary Portland Cement (OPC) or (SRC) 350-400 kg/m3
- Water for concrete Mixture
- Foaming Agent
- Silica Fume min. 5% of cement content
- Fiber : fiber glass
- Admixtures

Density

1650 kg / m3 to ***1850*** kg / m3

Compressive strength

Table 1 : Compressive Strength Of Cube Concrete (KanCrete) Specimens at different ages

Sample	Dimension mm	***Strength @ 28 days Kg/cm2***	***Strength @ 45 days Kg/cm2***	***Strength @ 240 days Kg/cm2***	***Strength @ 570 days Kg/cm2***
R	Cube 150x150x150	***368***	***443***	***525***	***620***
S	Cube 150x150x150	***303***	***377***	***425***	***560***

Compressive strength charts

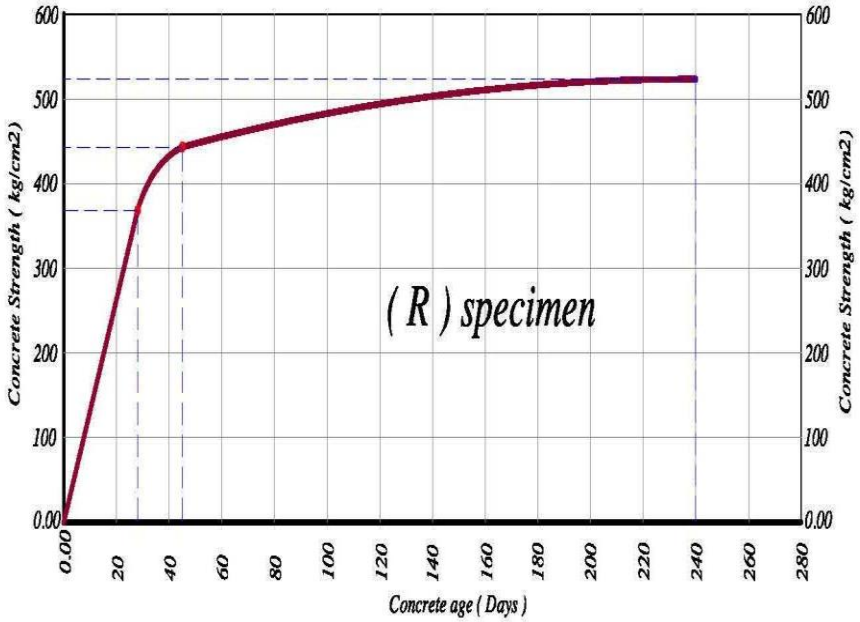


Figure 5 - Compressive Strength for KanCrete cubes (150x150x150 mm)

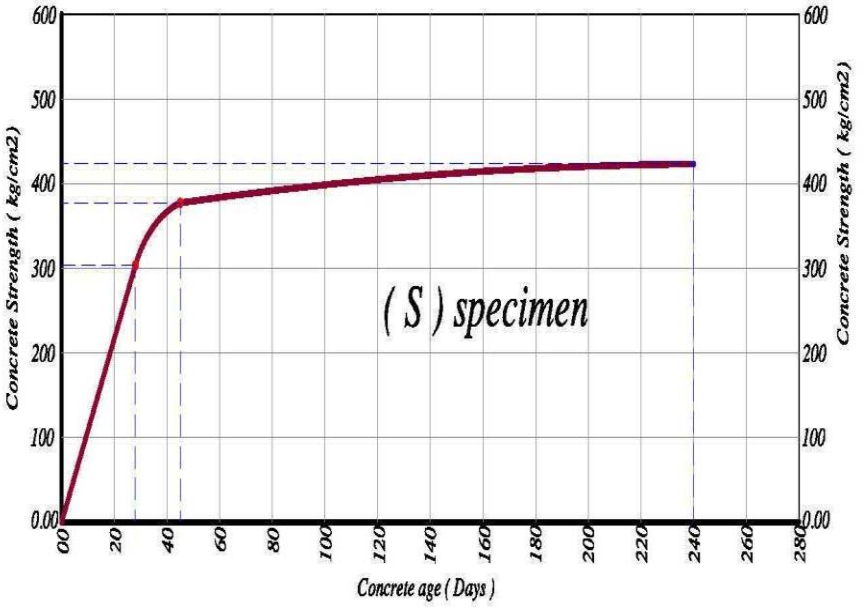
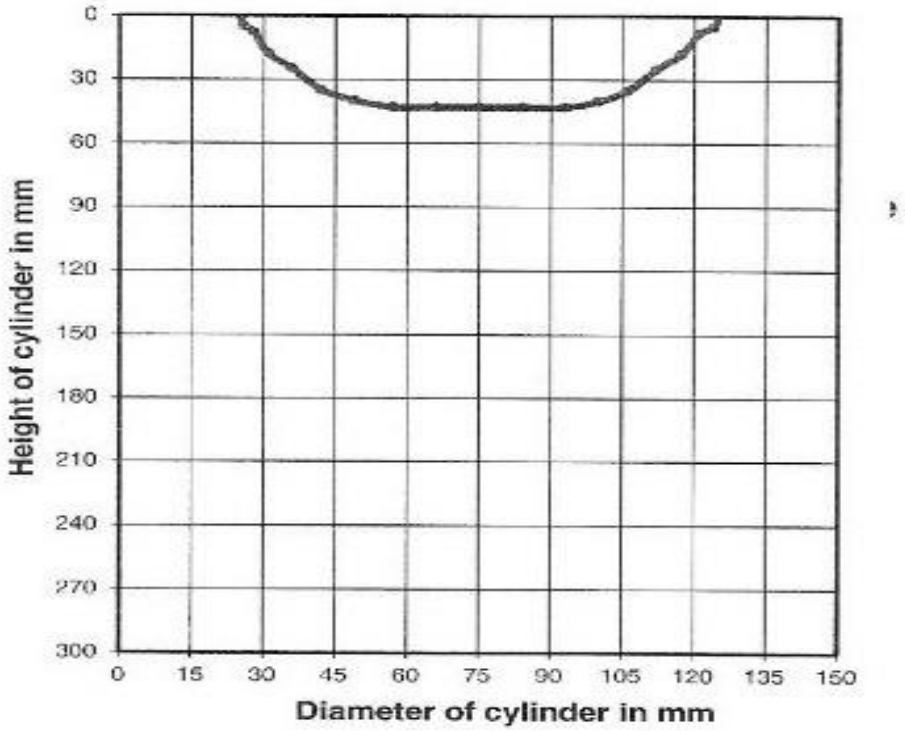


Figure 6 - Compressive Strength for KanCrete cubes (150x150x150 mm)

Water Permeability Test Results :

Typical arrangement for the determination of the water permeablity from the concrete cylinder representative sample (15 x 30 cm) when subjected to water pressure of 5 bar acting to the mold filling for a period of three (3) days.



Chemical Analysis Test Results

Table 2 : Chemical Analysis Test Results for (KanCrete) Specimens

Specimen	**pH**	Chloride **Cl** %	Sulfate **SO4** %	Remarks
S , R	***11.90***	***0.1080***	***0.125***	--

Heat Transfer Test Results

Test method:
(***using a German-made PWH device equipped with an automatic printer and digital measuring devices for each sample***)
The lower sample surface displays mounting temperatures, and the corresponding heat is measured on the upper surface.

- **First test**: the sample was exposed to a temperature = 65 ° C for two and a half hours and then raised to 110 ° C for two and a half hours.
- **Second test** : the sample was exposed to a temperature of 110 ° C for 8 continuous hours, and the temperature was recorded on the opposite side.

Heat Gain %age (Kandcrete Samples)

= 2.58% for first test & 2.47% for second test , respectively .

Excellent Results

Heat Transfer Test Results charts

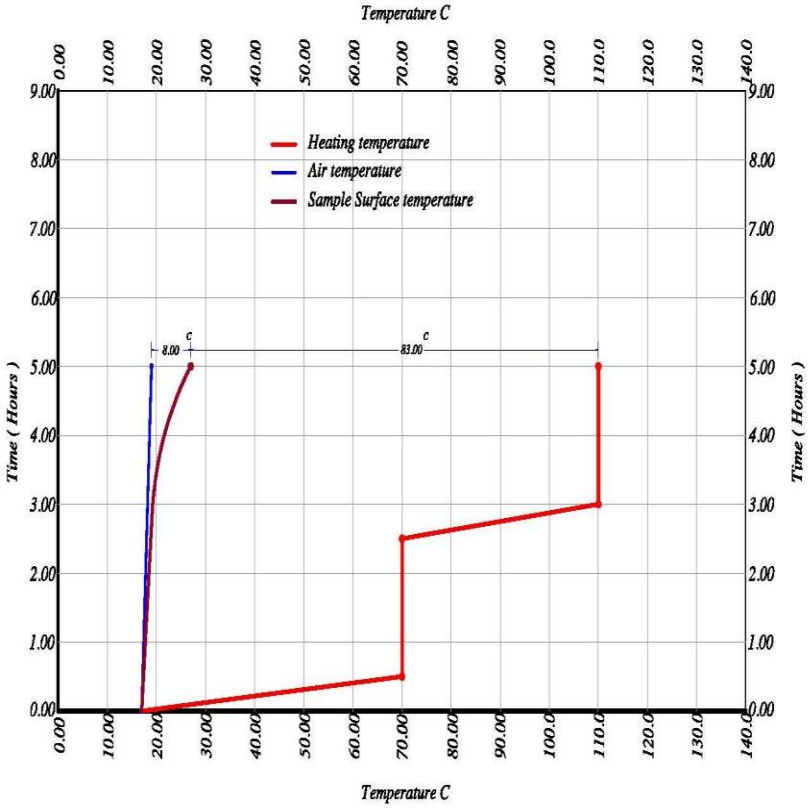


Figure 4 - Heat Transfer Resistance For 5 hours & 70 to 110 c heating

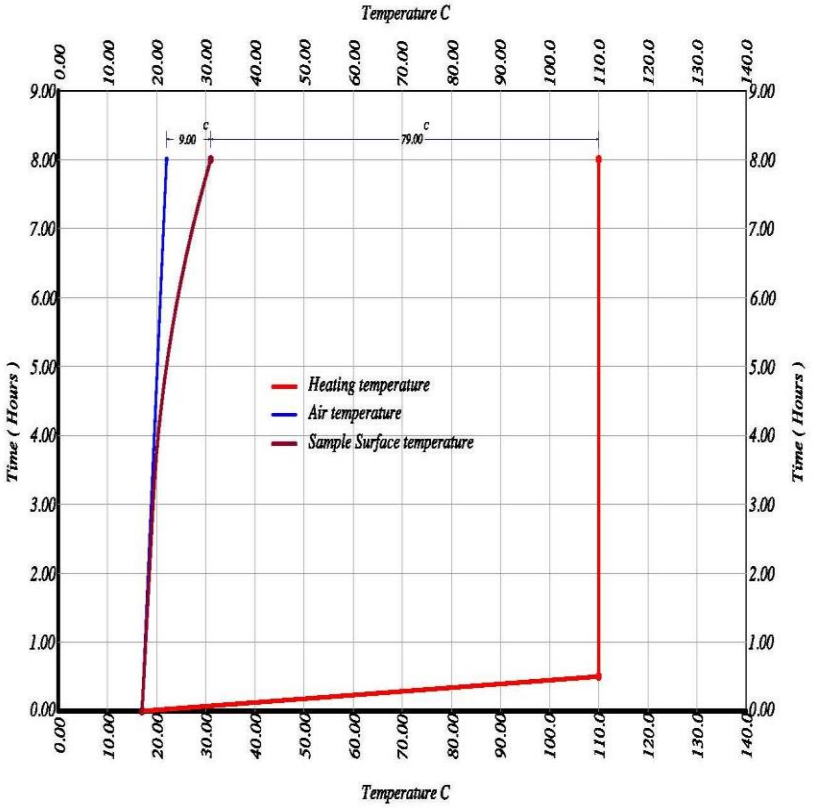
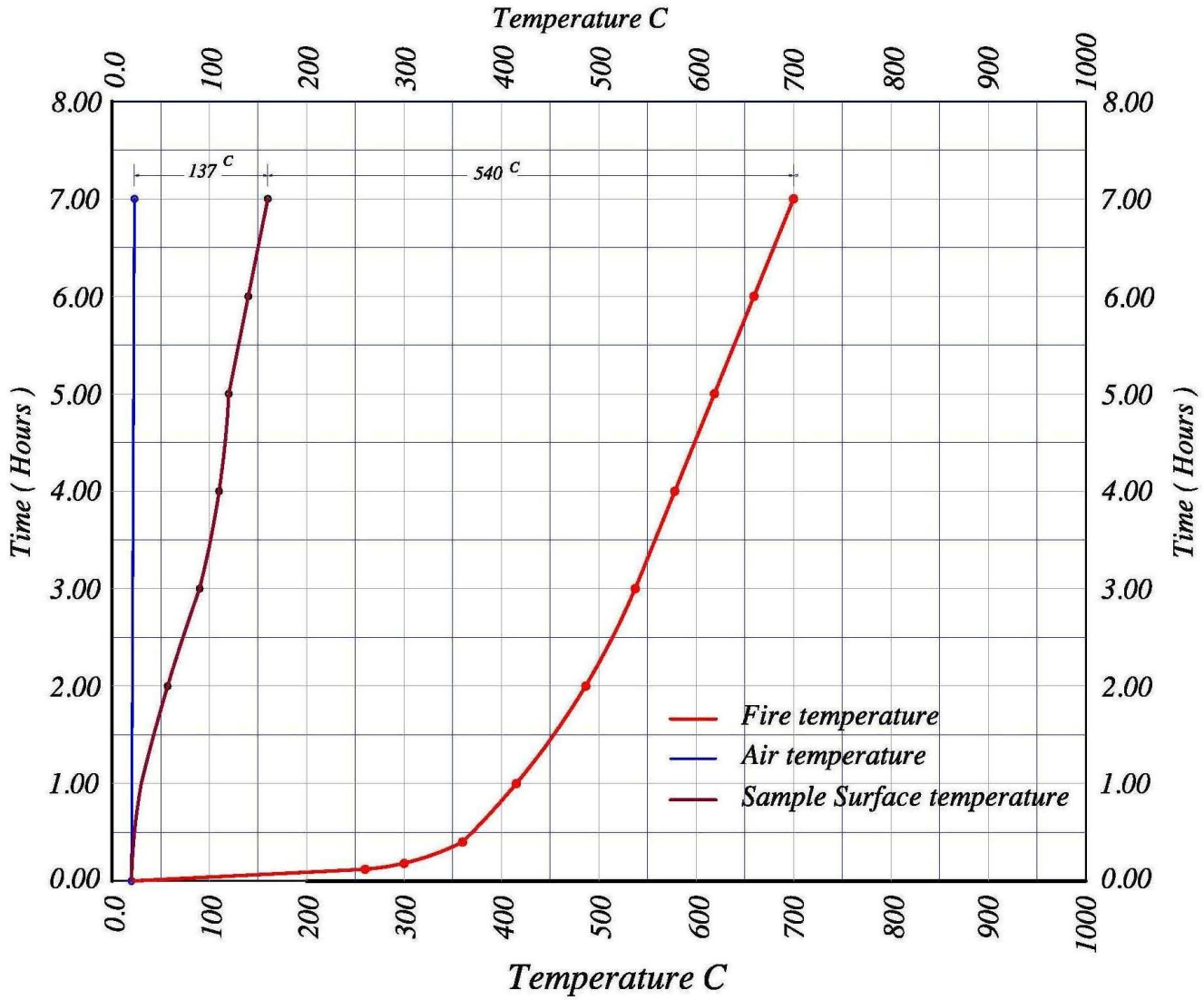


Figure 4 - Heat Transfer Resistance For 8 hours & 110 c cont. heating

Fire Resistance Test Results charts



“KandCrete“ MORE ADVANTAGES

RELIABILITY	*ECOLOGICAL COMPATIBILITY*
MICROCLIMATE	*BEAUTIFUL APPEARANCE*
QUICKNESS OF MOUNTING	*ECONOMY*
ACOUSTING INSULATION	*FIRE SAFETY*
NO NEED TO APPLY PLASTER	*SELF-HEALING*
DOES NOT ROT	*TERMITE RESISTANT*
REDUCING THE CARBON FOOTPRINT	*AESTHETICS & OCCUPANT COMFORT*

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The practical application of (KandCrete)

The structural system is :

The use of Kandcrete as an external and internal load bearing walls, by making a form for the whole house walls with the synthesis of all openings, installing all service supplies (plumbing - electricity - air conditioning …etc.) and then installing a single-layer mesh of rebar (or sufficiency) by placing steel reinforcement in the corners and intersections;

Then pouring the ceiling with the same intensity (or with prefabricated slabs of the same concrete) ; work is repeated in the case of repeated floors with the placement of (vertical dowels) in the lower walls to connect the upper walls to it.

So, we obtain fully structural system integral components and members , where there is no any joints or links, no welds, no (thermal bridges), so we get one body that works as a one structural unit with a full distribution of loads in various loading states , without any opportunity for differential settlement or great settlement or defects in other members (cracking – deflection – deformation - weak connections - buckling – torsion..etc.)

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The practical application of (KandCrete)

This system is used up to ten(+) floors high, completely safe . The structural system with (Kandcrete) concrete: is easily and quickly implemented - the union of all structural elements , does not need structural or appearance maintenance , often for a long time - retains its luster and appearance for many years , as it does not show symptoms of weakness or weariness over time - maintains a high structural efficiency which It makes its economic value always high - the default longevity of its counterparts to a large degree - it achieves the highest levels of comfort in terms of isolating the residential area from all harmful external factors, annoying or damaging, and it achieves safety from wind, humidity, heat, frost, weather fluctuation, and Reduces energy consumption to the extreme, this is high economic value at the individual and the international level.

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Example of The practical application of (KandCrete)

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Conclusion and recommendation

Sustainable development is a holistic endeavor, making it difficult to define the independent role any of the thousands of materials, products, or technologies used on a given construction site bring to supporting project-specific green-building objectives.

(KandCrete) considered as an innovative product for the human civilization, for the days to come & is expected to show its multi-various facets in all the spheres of construction yet to be explored in the hands of future researchers.

Thank You ..

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Mr. Ibrahim Kandil is a Civil Engineer consultant, BSc. 1977, Alexandria university, Egypt. He has +40 years of extensive experience in structural engineering & Soil mechanics with all its applications. worked as an executive director and consultant for large and diverse projects in Egypt & Gulf region, has engineering studies in buildings restoration and maintenance. has +300 Courses "CEUs" From :AIA, ACI, PCA, ASTM, USGBC, AISC, McGraw Hill Constr., CED Inc., WP council, BD+C university, NFBA, Gr. Builder College, NIBS, Green CE Inc., RON BLANK &Associates Inc., BUILDER College, WBDG. And Civil Engineer Consultant (Saudi council of engineers).

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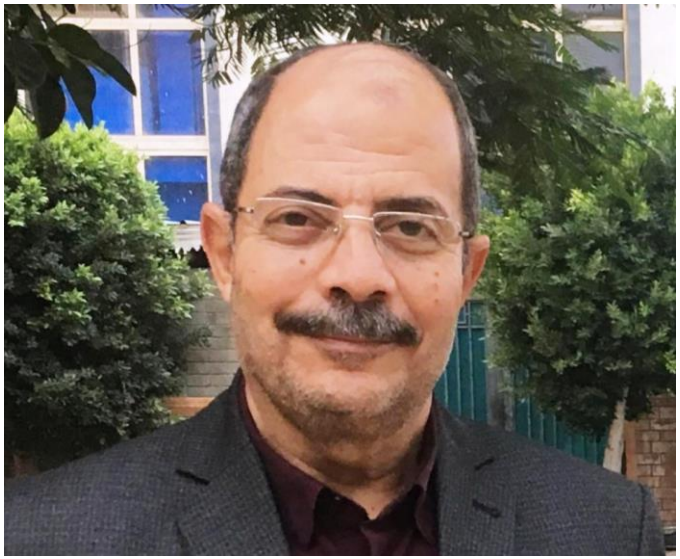

SPEAKER :

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