ENGINEERING DESIGN

VANDIDAD

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Preface

Vandidad Engineering Company established in 2005 by presence of elite graduates of famous domestic universities. The management of this company has focused on costumer care, responsibility, reputation and attracting costumer reliance to perform civil projects and achieve expected goals and development.

Vandidad Company has been working in field of producing specific concrete and cooperating in civil and infrastructure projects by employing modern products and technologies and relying on current knowledge and facilities which resulted in considerable success of modern industry. Therfore, Research and Development Center of this company had achieved great honors in field of producing NANO Structural Lightweight Concrete (NSLWC) for the first time in Iran. Certificates of great interntional authorities indicate glorious evolution of this national industry. Vandidad Company is trying to provide required services and achieve employer's satisfaction by employing experiences and commitment of its experts.

Innovator of NANO Structural Lightweight Concrete in Iran

First and the only manufacturer of specific readymix concrete package in Iran

NANO Structural Lightweight Concrete

This type of concrete with specific weight of 1250 kg/m^3 to 1550kg/m^3 has compression resistance of 200 kg/cm^2 to 500 kg/cm^2 which are unique in comparing to plain concretes.

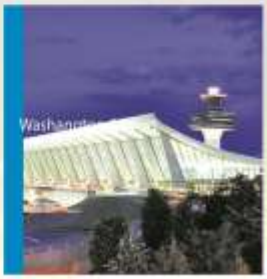
plain concrete has many weak points and the studies to remove such disadvantages had resulted in innovative production of specialized concrete. Low ratio of resistance to weight in normal concrete in comparison with steel is one of the economic problems in construction of huge structures such as bridges and towers. Moreover, usage of lightweight structural concrete in high-rise structures will decrease dead loads and earthquake impacts which may considerably decrease the weight of steel in structure.


Washington Airport

History of Lightweight Concrete

First historical reports about usage of lightweight concrete and materials in construction refer to Ancient Rome. The Romans had employed pumice in construction of Pantheon Temple and Coliseum. After production of artificial and processed lightweight concrete in early 20 th Century, the usage of lightweight concrete entered new level and has been employed in many buildings, bridges, ships and other structures since then.


Pantheon Temple




Selma Ship


Plaza Park Hotel


Kivzyym Stadium

Advantages of Using NANO Structural Lightweight Concrete

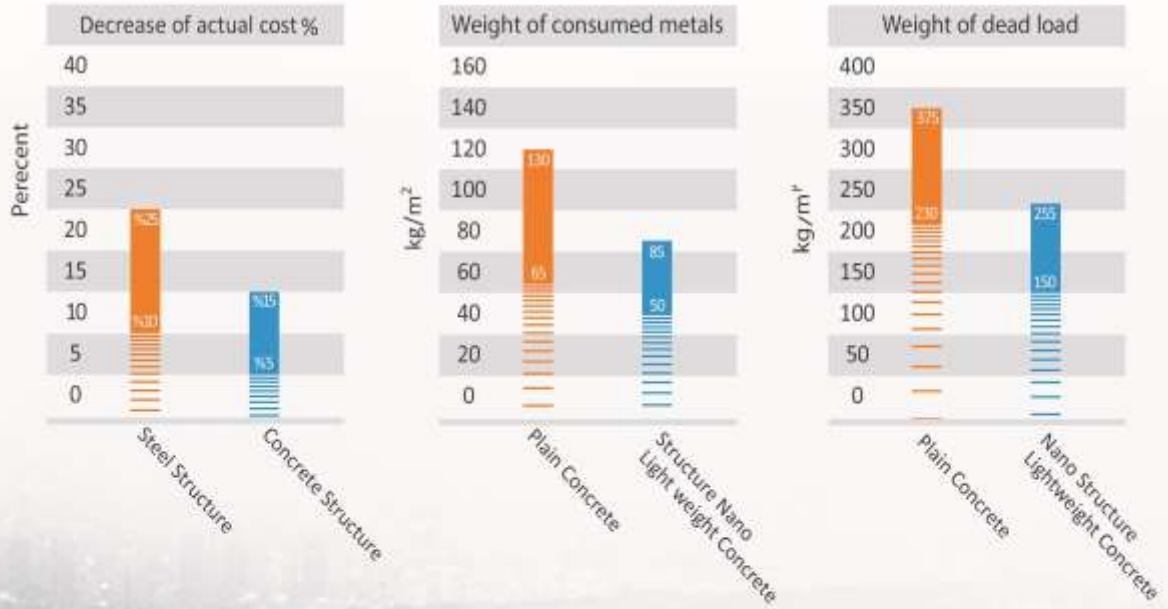
As lightweight structural concretes are decreasing dead load and earthquake powers which result in decrease of weight of steel structures or volume of concrete and used steel, it can be considered as an effective factor in actual cost of structures. Moreover, using this kind of concrete will also decrease usage of national resources and will result in public interests that can be summarized as follows:

Direct Benefit

- Decreasing weight of structure
- Decreasing impacts of earthquake power
- Decreasing size of pillars
- Decreasing usage of steel, concrete and armature
- Decreasing transportation costs
- Increasing usable and vendible area
- Increasing resistance against fire
- Heat transfer coefficient is less than plain concrete
- Sound decrease coefficient is more than plain concrete
- Increasing construction speed on the basis of decreasing material consumption

Public

- Decreasing environmental pollution
- Increasing structure's resistance against damages of passive defense
- Increasing service life of the building
- Decreasing earthquake risk
- Decreasing fire risk
- Decreasing cost of accident insurance
- Saving energy
- Decreasing cement consumption and increasing cement exports
- Increasing exchange incomes through exporting to other countries

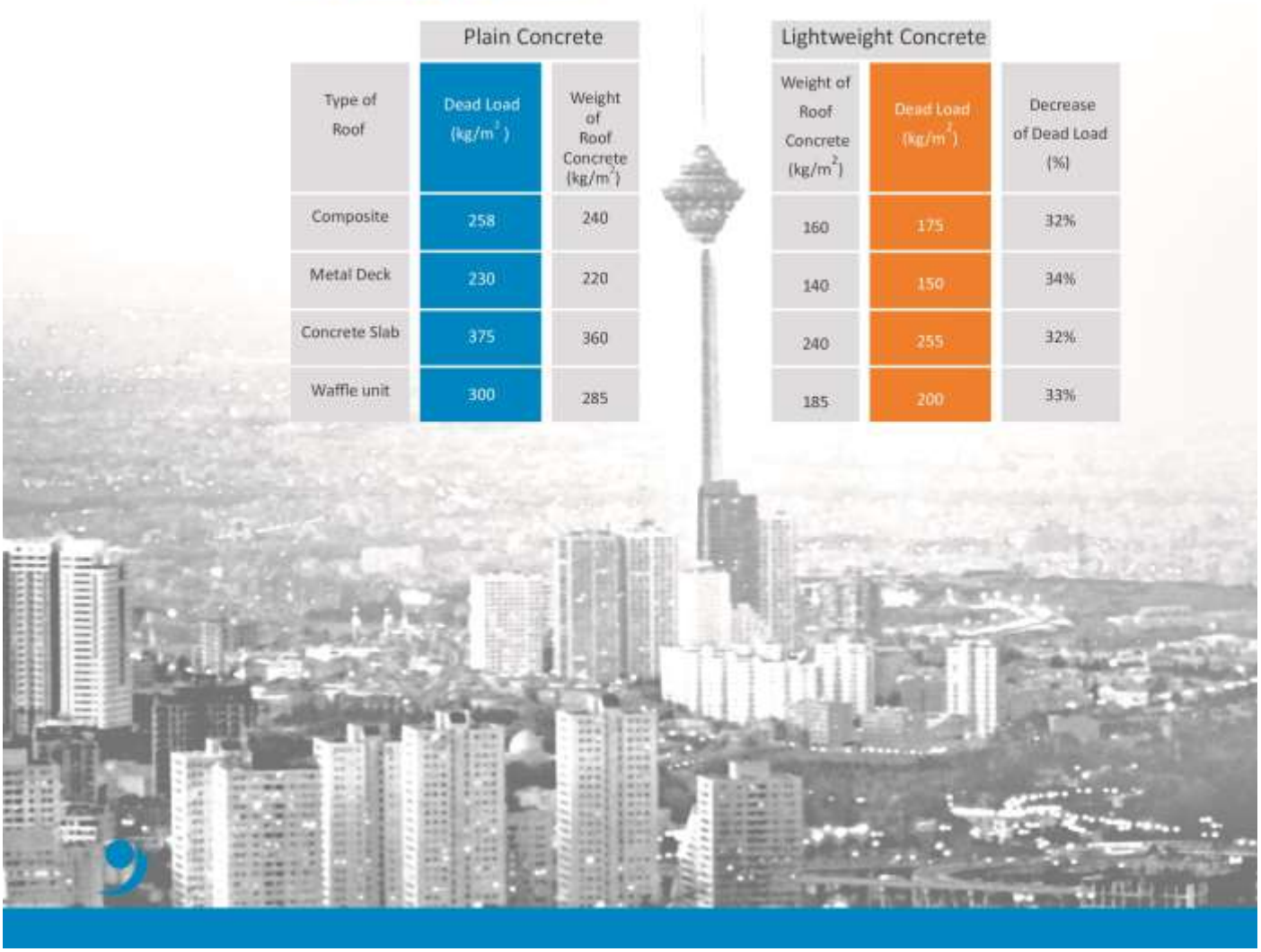


Comparing plain Concrete with Lightweight Structural Concrete

Type	specificWeight ton/m^3	Compression kg/cm^2	Tensile Strength
Plain Concrete	2.30 – 2.40	200 – 450	8 – 16
NANO Structural Lightweight Concrete	1.25 – 1.55	200 - 500	8 - 17

Decrease of Dead Load

	Plain Concrete		Lightweight Concrete		
Type of Roof	Dead Load (kg/m^2)	Weight of Roof Concrete (kg/m^2)	Weight of Roof Concrete (kg/m^2)	Dead Load (kg/m^2)	Decrease of Dead Load (%)
Composite	258	240	160	175	32%
Metal Deck	230	220	140	150	34%
Concrete Slab	375	360	240	255	32%
Waffle unit	300	285	185	200	33%



Permits & Licenses

Operation License

Patent license for producing lightweight NANO concrete with high resistance

License of Tehran Civil and Engineering Organization

Third Global Position in Lightweight Structural Concrete Competitions

Technical License (Issued by Building and House research Center)

Achievements

Best National Unit in Field of NANO Technology (Science & Technology Park of University of Tehran)

Best Modern Technology Project 2009 (Ministry of Science, Research and Technology)

Certificate for producing NANO Structural Lightweight Concrete (University of Tehran)

Selected Unit for Production of NANO Structural Lightweight Concrete in 2009 (Presidency Nanotechnology Development Committee)

Best project in first Concrete and Cement Industry Exhibition

Certificate for executing Structural Lightweight Concrete (Boland Payeh Company)

Certificates

ISO 9001:2008

OHSAS 18001:2007

ISO14001: 2004

HSE-MS

Other Products and Services

Vandidad science based company is providing consultatio, design, material supply, production and other following services on the basis of its valuable experimental and research experiences and also by equipping laboratory units (test company) and operating factory of specialized concretes (Sepehr Beton Vandidad Factory):

NANO Structural Lightweight Concrete (NSLWC)

Structural lightweight concrete with approximate specific weight of 1.25 to 1.55 ton/m^3 and strength of 200 to 500 kg/cm^2 decrease weight of dead load and increase structure's resistance against earthquake effects which result in decrease of actual cost of structure.

Lightweight Concrete (LWC)

Lightweight concretes with approximate specific weight of 0.80 to 0.30 ton/m^3 and nonstructural strength (less than 170 kg/cm^2) can be used in unloading walls, fillers and pre-fabricated nonstructural parts.

High Strength Concrete (HSC)

Nowadays, modern methods are developed on the basis of high strength concretes and normal strengths are gradually forgotten. 420 kg/cm^2 to 950 kg/cm^2, is accessible strength of concretes produced by this company which may be useful in tall structures, pre-stressed parts and some special structures.

High Performance Concrete (HPC)

Although compressive strength is one of the main and effective factors in structures' design, other specification including performance, primary strength, long-term particulars of the concrete, permeability, resistance against destroying factors, specific weight, hydration temperature and etc. have considerable importance too. High performance concretes are designed to supply consumer's demands in mentioned operations.

Self Compact Concrete (SCC)

Self compact concrete is a new type of specialized concretes which have been used in different projects since early 1990s. This type of concrete is widely employed worldwide in massive concrete casting especially in operation without the capacity of vibration. This type of concrete is injected in molds without vibration. As result of appropriate fluidity, it will fill all gaps of concrete casting without bleeding or segregation. In operating this special type of concrete, slumps are replaced by concrete and result in fascinating operability.

Roller Compact Concrete (RCC)

Roller compact concretes are dense concretes with low value of cement which may be used in concrete projects and dam construction. The capacity of using roller in operation of this product results in high resistant and useful road surface construction. Nowadays, roller compact concrete is employed in most road pavement projects.

Design and Production of Pre-fabricated Parts

- Composite lightweight pre-fabricated slab
- Precast slab of bridge deck
- Precast pre-stressed beams

Producing Packaged Dry Specific Concretes

Considering mixture of aforesaid specific concretes and necessity of controlling selection, weighing and mixture of materials, although Sepehr Beton Vandidad Factory is manufacturing packed specific concretes, it is exclusively produce mentioned types of concretes in form of packed and dry products. This technique is guaranteeing quality of products, solve ransportation issued and provide required conditions for usage of specific concretes in long distances.

Bylaws and References

- Physical specification of structural lightweight concrete (9th topic of National Building regulations)
- Observing usage of aggregates in accordance with National Iranian Standard no. 302 (concrete aggregates)
- Observing usage of aggregates in accordance with National Iranian Standard no. 4985 (specifications of light weight aggregates for structural concrete)
- Adapting specific weight of aggregates of lightweight concrete with ASTM C330 standard
- Adapting determination of specific weight of lightweight concrete with ASTM C567 standard
- Bylaw of mixing lightweight structural concrete ACI211.R2
- Instruction for lightweight structural concretes ACI 213
- Range of additive materials in accordance with National Iranian Standard no. 2930

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Sepehr Beton Vandidad Factory

- Exclusive production of lightweight structural concrete and specific dry packaged concretes
- Capacity of producing 170,000 m^3 ready and packaged concrete
- Producing concrete with different mixture design and various applications and demands on the basis of employer's and project's needs (high strength concrete and lightweight concretes)
- Producing specific concretes (SLWC, SCC, RCC, HSC, HPC)
- Achieved Iran Standard Certificate for readymix concrete with C50 resistance grade (500 kg/cm2)
- Two production line of readymix concrete with wet and dry systems
- Equipped and efficient concrete laboratory

Concrete Production Complex in Parand New City

Test Consulting Engineers

Test Consulting Engineers

Vandidad Engineering Company had established Test Consulting Engineers Company in 2011 to perform consultation, design, supervision and laboratory services.

Test Company is supplying consulting services in field of design, supervision and laboratory affairs.

- Second rank of geo-technique from Ministry of Road and Urban Development
- Second rank of concrete production from Ministry of Road and Urban Development
- Highest rank of design and supervision from Ministry of Road and Urban Development

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Subsidiary companies

Master rank in field of design and supervision

2nd Rank in Field of Geo-technique

Subsidiary companies

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Behdis Saman Amin (BESA) Mass Construction Cooperative Company

Vandidad Engineering Company had established BESA Company in 2010 for executing mass construction projects. This company has rank 3 in field of mass construction and is providing services under mentioned title.

3rd Rand in field of mass construction

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Banian Namad Exon (BANA) Company

Vandidad Engineering Company had established BANA Company for management and execution of constructional projects.

This company is providing following services relying on valuable experiences of its personnel:

- Managing constructional projects
- Designing and executing constructional projects in form of EPC and EPCF
- Executing value engineering services, optimizing and elevating the structures
- Designing, producing and executing metal deck roofs (specific profiles)
- Executing concrete projects with specific concretes

2nd Rank in field of construction

Equipments and Machineries

No.	Type of Equipment and Machinery	Quantity
1	Robat Karim Readymix Concrete Factory	1
2	Specific Concrete Factory	1
3	Mobile Concrete Pump	2
4	stationary Pump	1
5	Truck Mixer	5
6	Auto Mixer	2
7	Dump Truck	2
8	Loader	1
9	Excavator	1
10	Pump	1
11	Compressor	2
12	Rectifier	4
13	Concrete Mixer	6
14	Rebar Bender and Cutter	4
15	Metal Cast	10000 m^2
16	Electric Lift	5
17	Conex box	8
18	Truck	3
19	Generator Disel	2
20	Bunker (150 Tons)	6
21	Passenger Car	4
22	Metal Deck Forming Machine	1
23	Metal Trowel Machines	7
24	Laser Level	3
25	Stud Welding	3

ENGINEERING DESIGN
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