
BGA Piles
بنیان گستر اروند

PHC piles were first invented in Japan in the 1970's as a means to provide a solid base for building structures in a rapidly growing and earthquake prone country.

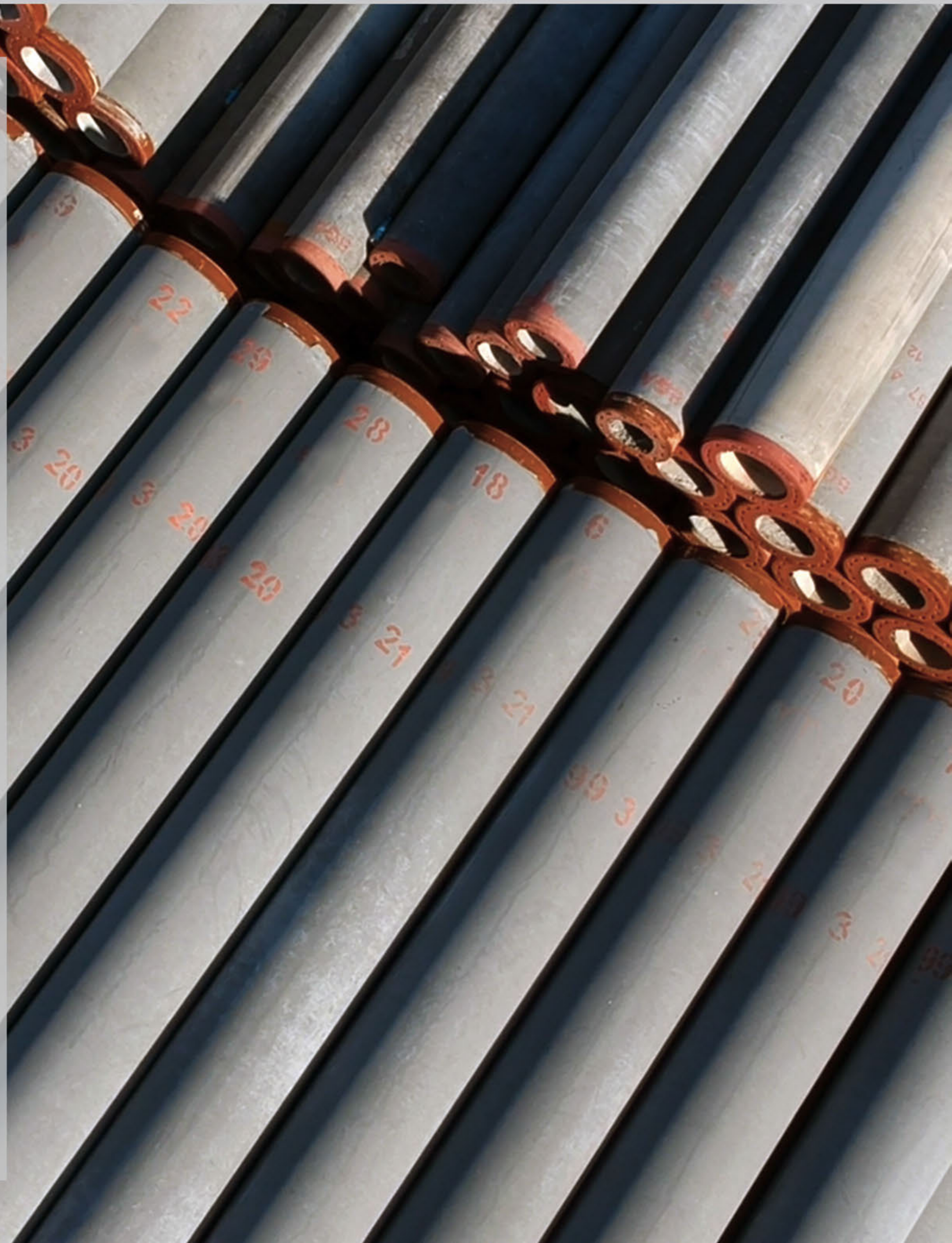
Since their invention in Japan, PHC piles have been used widely in developed countries such as USA, Germany, Italy, as well as Korea, Singapore, Malaysia, Thailand, Indonesia, Vietnam and played a key role in rapid development of China and Southeast Asia.

In any important project, foundations and soil improvement are the first stage of development. For over 50 years PHC piles have provided the safest, fastest and most economical solution as a foundation for major infrastructure and investments.

BGA was established in 2011 to produce Pre-stressed High Strength Concrete Piles (PHC Piles) in addition to poles and other PHC products with the aim of supplying Iran's growing needs for advanced technological solutions for deep foundations and soil improvement

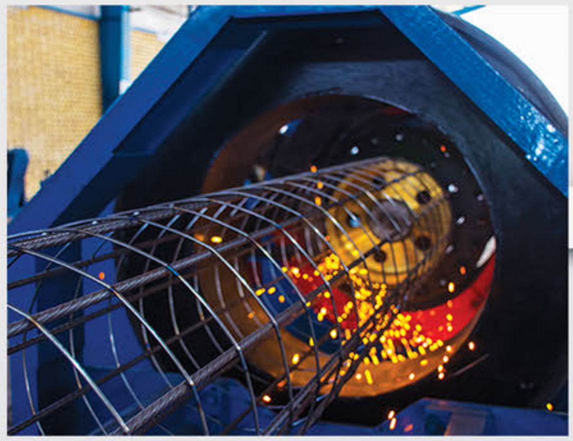
At BGA, our prime objective is to get a complete understanding of our clients' needs to ensure we provide them with the best possible solution for their soil improvement needs at the lowest cost through an ethical business.

BGA is expanding his production capacity to 500 kilometers per year in Khorramshahr Factory and establishing the biggest factory in the world in Qeshm Island, Iran with 8000 meters pile daily production rate within next two years.



Manufacturing Process

1. Caging
Cutting and Heading Pre-stressing PC Bars - Automatic Caging



2. Concrete Feeding
Admixture, feeding, Pre-stress Jacks

3. Centrifugal Procedure
Concrete Initial Curing

4. Steam Curing
Concrete steam curing

5. Final actions
Demolding and Open area curing

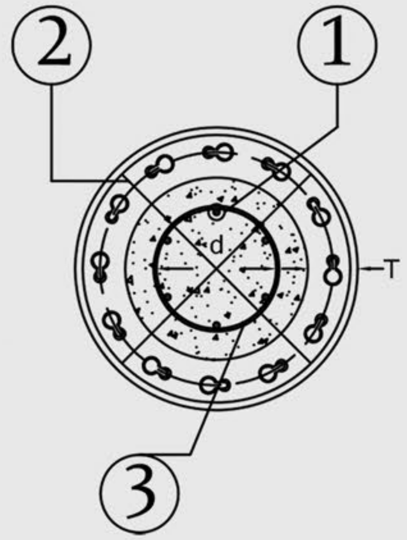
Manufacturing Process Video

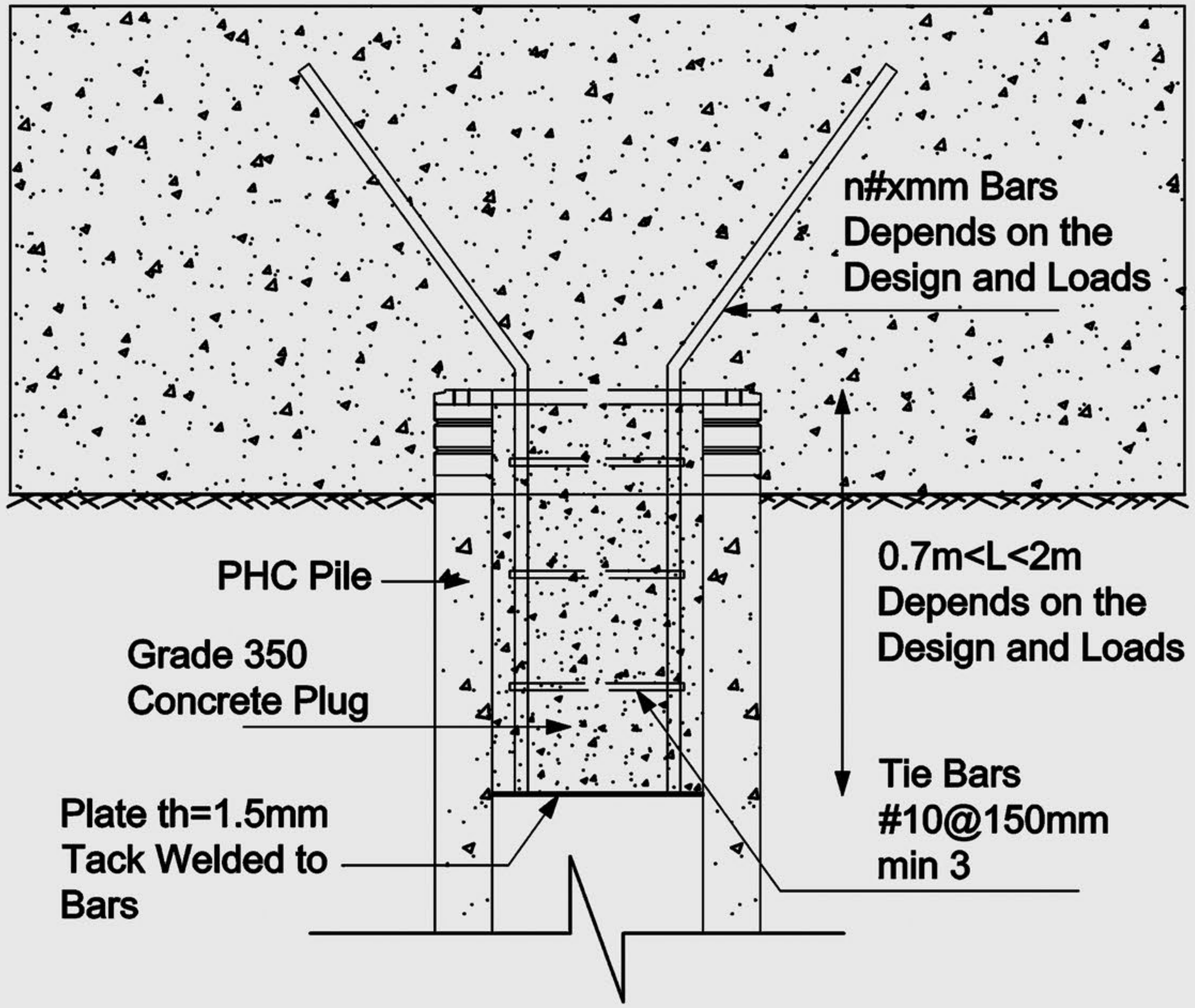
Properties of BGA PHC Piles

Diameter	Grade MPa	Class	Thickness (mm)	Length (m)	Weight (kg)	Concrete Area (mm2)	Allowable Structural Axial Load (tons)	Bending Moment Cracking (kNm)	Bending Moment Ultimate (kNm)	Effective Pre-stress (N/mm2)
300	70	C	60	4_15	118	45239	84	39.2	78.5	7.6
450	70	B	80	6_15	242	92991	155	107.9	194.2	5.2
	70	C	80	6_15	242		173	122.6	245.2	7.2
600	70	B	100	6_15	408	157080	265	245.2	441.4	5.3
	70	C	100	6_15	408		292	284.5	569	7
800	90	C	120	6_12	667	256354	475	637.6	1275	7.4
1000	90	C	140	6_12	983	378248	699	1177	2354	7.5

Splicing, Connection to Foundation and Pile Shoes

PILE SIZE(mm)	T(mm)	D(mm)	d(mm)	1(mm)	2(mm)	3(mm)
450	80~900	270~290	190	6 Φ18	3 Φ 8	Φ6@200
600	100~110	380~400	190	6 Φ22	3 Φ 8	Φ8@200





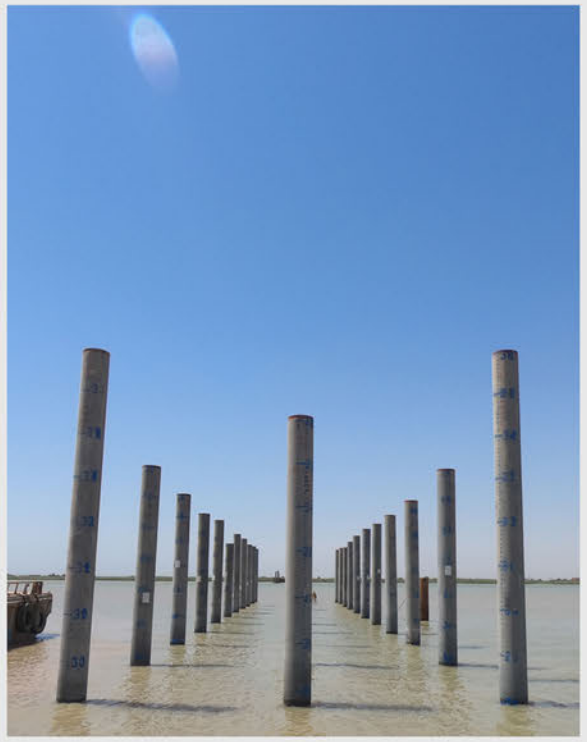
QUALITY CONTROL

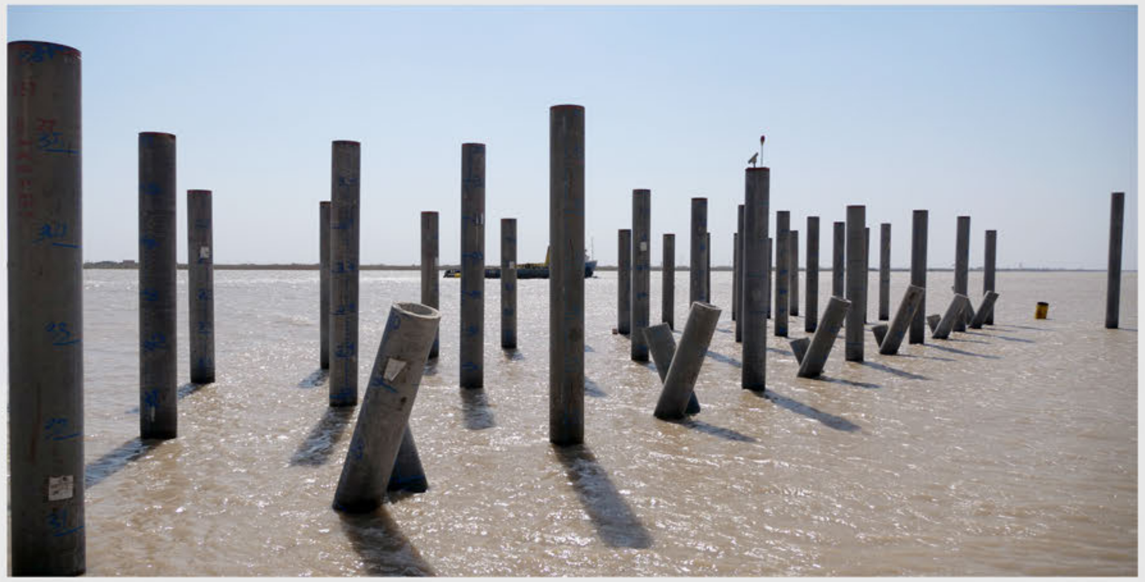
ASTM C143 / C143M - 20 Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C1202 - 19 Standard Test Method for Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration
ASTM D2419 - 14 Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM C191 - 19 Standard Test Methods for Time of Setting of Hydraulic Cement by Vicat Needle
ASTM C230 / C230M - 21 Standard Specification for Flow Table for Use in Tests of Hydraulic Cement
ASTM C127 - 15 Standard Test Method for Relative Density (Specific Gravity) and Absorption of Coarse Aggregate
ASTM C128 - 15 Standard Test Method for Relative Density (Specific Gravity) and Absorption of Fine Aggregate
ASTM C29 / C29M - 17a Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate
ASTM C136 / C136M - 19 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C597 - 16 Standard Test Method for Pulse Velocity Through Concrete
ASTM C805 / C805M - 18 Standard Test Method for Rebound Number of Hardened Concrete
ASTM C39 / C39M - 21 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM D1143/D1143M -07 Standard Test Method for Static Axial Compressive Load
ASTM D4945 - 12 Standard Test Method for High-Strain Dynamic Testing
JIS A 5337 Bending Test of a Pile Body-Concrete Pile Bending Test

Applications of PHC Piles

PHC piles are most effective solutions in the following uses:

- Water desalination plants
- Hinterlands
- Liquefaction Mitigation
- Geothermal system
- Concrete cut-off walls
- Bridge piers as deep foundation or pier piles
- Tall Buildings
- Marine structures and harbours
- Equipment foundation solutions for petroleum gas and steel plants
- Petroleum and gas tanks, water and sewage,waste water treatment plants





Facts and Figures

Item	PHC Piles according to JIS5373:2016	Square Piles according to ACI543:2012
Concrete Strength	At least 70 MPa	At least 50 MPa
Durability	50/100 years life time	5/10 years life time (because of Crack)
Transportation	100 meter (for spun pile 450 mm) per semi-truck (20 tons capacity)	50 meter (for cube pile 400mm) per semi-truck (20 tons capacity)
Installation time	Faster	Slower
Execution damage	Less than 1 %	Almost 30% due to cracking in the erection
Connection to Cap	Easy and fast and cheap by insert normal bar	Very hard and uncertain
Pile Head Trimming	Cutting – Cheaper- Doesn't damage the body of the pile	Demolition – More Expensive- Damages the body of the pile
Unit weight	Hollow core-240kg per meter for 450 mm spun pile	Solid section-400kg per meter for 400mm cube pile

Item	PHC Piles according to JIS5373:2016	Bored Piles according to ACI543:2012
Concrete Strength	At least 70 MPa	At least 50 MPa
Durability	50/100 years life time	5-10 years due to ground water, collapsing soil, bentonite yellow cake, concrete fall distance
Transportation	100 meter (for spun pile 450mm) per semi-truck (20 tons capacity)	Cast-in situ Execution – concrete pouring at site, rebar caging at site
Installation time	Min 12 points per machine per day	Max 3-4 points per day
Execution damage	Less than 1 %	Uncontrollable concrete quality
Connection to Cap	Easy and fast and cheap by insert normal bars	More expensive
Pile Head Trimming	Cutting – Cheaper- Doesn't damage the body of the pile	Demolition – More Expensive- Damages the body of the pile
Unit weight	Hollow core-240kg per meter for 450 mm spun pile	400 kg per meter for 450 mm bored piles – Solid section

BGA Piles

بنیان گستر اروند

Arvand Free Zone, Khorramshahr, Iran P.O Box: 6438193311

+989108061982 - +989108062739

+986153583300-+986153583305

www.bgapiles.com info@bgapiles.com