شركة الافاق العربية للطاقة

- We pride ourselves in providing the finest-quality products and services with integrity and dedication to superior customer service at all levels.

Arabian Horizons for Energy Co.

info@afak.net / www.afak.net

AFAK GROUP.

Arabian Horizons for Energy Co.

Headquartered in Jeddah, K.S.A., AFAK is the leading designer, supplier and installer of water and wastewater piping solutions, renewable energy, irrigation and water desalination.

We build technologies and provide engineering services that address the most complex challenges faced by engineers, site owners, contractors, and distributors.

Engineered with confidence, our solutions put people to work with safety, ensuring reliability and maximizing efficiency.

Unlike any other Product Distributors in the Gulf Region, Afak offers Value Added Services designed to facilitate evaluation, planning, and fulfillment of all types of customer piping system needs.

With 1 warehouse in Riyadh and another in Jeddah, Afak is surely ready to supply the most service-oriented customer in the Middle East.

Afak's inhouse engineering team combines specialist technical knowledge, creative thinking and on-the-job experience, to offer our clients a range of project planning and consultation services.

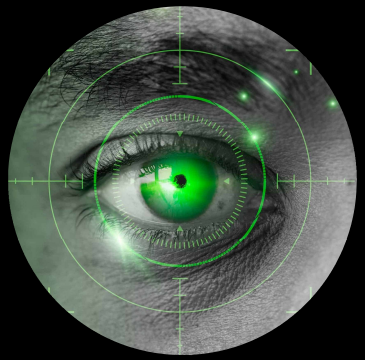
ABOUT US

- For more than 25 years, our personnels have worked diligently to build a strong, vibrant tradition of making connections – from pipe to pipe and people to people.
- The company's enthusiasm for crafting unconventional solutions has allowed it to forge new paths in new markets as it tackles the industry's most unique challenges.
- We pride ourselves in providing the finest-quality pipe products and services with integrity and dedication to superior customer service at all levels.
- We provide expertise and product solutions for a wide range of applications, from building, water and wastewater, industrial, mining, oil and gas to renewable energy, irrigation and water desalination

MISSION

To strengthen our position of leadership in global piping industry, AFAK and its employees hereby commit:

- **To consistently develop and offer systems and services that provide real value to our customers, through Africa and the Middle East.**
- **To train and develop our employees and provide them with an environment that fosters growth and career satisfaction and encourages them to challenge our processes.**
- **To recognize our responsibilities to our shareholders, to the environment, and to the communities in which we live and work.**



VISION

- **Engineered with confidence, our solutions put people to work with safety, ensuring reliability and maximizing efficiency.**

OUR VALUES

We believe that:

- It's best to do things very well, on time every time.
- Unlike any other Product Distributors in the Gulf Region, Afak offers Value Added Services designed to facilitate evaluation, planning, and fulfillment of all types of customer piping system needs.
- We are committed to improving power generation capacity, maximizing equipment service life, improving operational efficiency, and optimizing project economic benefit.
- Provide customized services, including power plant engineering services, site environmental management, and site selection for the integration of power plants with other industrial facilities.

AFAK PRODUCT

- **Afak Products includes but not limited to:**

  - ❑ **Carbon steel piping system;**
  - ❑ **Ductile iron piping system;**
  - ❑ **Grooved System;**
  - ❑ **Fittings, Valves, Accessories, Pumps;**

  - ❑ **Complete Solar System (branded photovoltaic modules and branded inverters, storage batteries, and cable products ...);**
  - ❑ **Complete Irrigation system;**
  - ❑ **Water Desalination system;**

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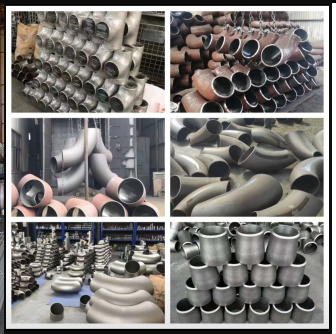
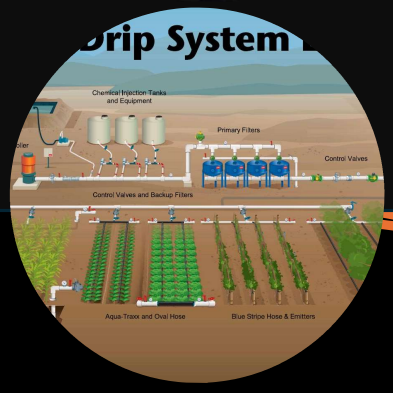
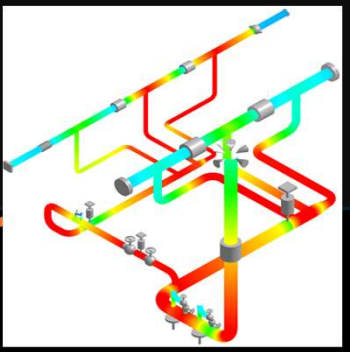




Complete Piping Solution



SERVICES

- ✓ **Pipe stress analysis.**
- ✓ **Design, detailed plan and section, layout, and isometric drawings can be prepared.**
- ✓ **Our Engineered Products provide special solutions to unique applications and product needs.**
- ✓ **Availability of Trained Specialists to serve our customers on site.**
- ✓ **Product take-offs, cut sheets, and bills of material can be developed for complete or section by section projects.**

In a project-based industry, timing is everything. At Afak, our approach to supply and distribution is based around a dedication to consistency, responsiveness and service excellence.

- ✓ **There are few primary issues that AFAK has at hand:**
  - ❑ **Carry quality,**
  - ❑ **Maintain good stock until sale,**
  - ❑ **Provide advice, which is more helpful than harmful,**
  - ❑ **Deliver on time every time,**
  - ❑ **Qualified Sales engineers assuring technical support at site,**
  - ❑ **Qualified customer care answering customer requirements.**


AfaK
CARBON STEEL PIPE

Longitudinal Submerged Arc Welded LSAW Pipe

LSAW Pipes are formed by rolling a discrete length into a cylinder and welding it both longitudinally and laterally. This method can produce the largest and thickest pipe sections, which can be used as load bearing piles, combination wall piles or other applications.

Spiral Submerged Arc Welded SSAW Pipe

SSAW Pipe are formed in a spiral and welded both inside and outside continuously. They are typically used as King Piles for Combination Walls and also Dredging Pipe.

Electric Resistance Welded ERW Pipe

ERW Pipes are manufactured by rolling the raw plate into a cylinder and then passing a current through to fuse the two ends. They are typically used for fencing, scaffolding and line pipes for fluis and gases.

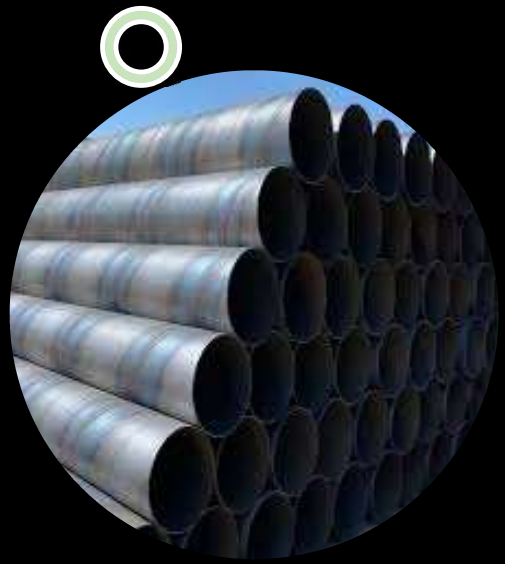
AfaK

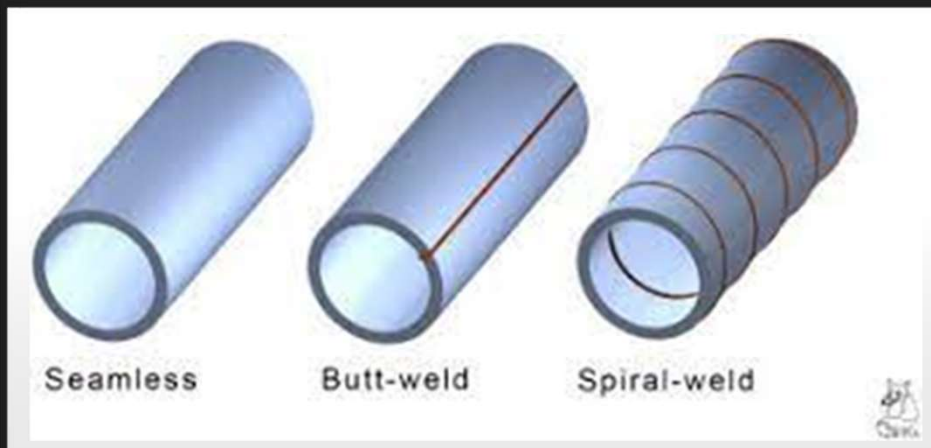
Manufacturing Processes

- *Spiral Submerged Arc Welded Pipe*
- *OD.: 323 – 3800 mm*

- *Longitudinal Submerged Arc welded*
- *OD.: 355 – 1422 mm.*

- *High-Frequency Welded Pipe*
- *OD.: 139.7 – 426 mm*





Chemical Composition

a. Cu ≤ 0,50 %; Ni ≤ 0,50 %; Cr ≤ 0,50 % and Mo ≤ 0.15%
b. For each reduce of 0.01% Carbon Max, an increase of 0.05% of maximum Mn is permited, up to a maximum of 1.65 for grade ≥ B or L245, but ≤ X52 or L360; Up to max 1.75% for grades above L360 or X52, but below L485 or X70; And up to 2.00% max for grade X70 or L485.
c. Unless otherwise agreed, Nb + V ≤ 0.06%.
d. Nb + V + Ti ≤ 0.15%.
e. Unless otherwise agreed.
f. Unless otherwise agreed, Nb + V + Ti ≤ 0.15%.
g. B shall be not added in on purpose, and maximum B is 0.001%.

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Chemical composition								
Steel Grade (Steel Name)	Wall Thickness ≤ 25.0 mm (0.984 in)							
	Mass fraction, based upon heat and product analyses							
	%							
	C	Mn	P		S	V	Nb	Ti
	max	max	min.	max	max	max	max	max
Seamless pipe								
L175 or A25	0.21	0.60	—	0.030	0.030	—	—	—
L175P or A25P	0.21	0.60	0.045	0.080	0.030	—	—	—
L210 or A	0.22	0.90	—	0.030	0.030	—	—	—
L245 or B	0.28	1.20	—	0.030	0.030	c,d	c,d	d
L290 or X42	0.28	1.30	—	0.030	0.030	d	d	d
L320 or X46	0.28	1.40	—	0.030	0.030	d	d	d
L360 or X52	0.28	1.40	—	0.030	0.030	d	d	d
L390 or X56	0.28	1.40	—	0.030	0.030	d	d	d
L415 or X60	0.28	1.40	—	0.030	0.030	f	f	f
L450 or X65	0.28	1.40	—	0.030	0.030	f	f	f
L485 or X70	0.28	1.40	—	0.030	0.030	f	f	f
Welded (ERW, LSAW, SSAW) pipe								
L175 or A25	0.21	0.6	—	0.030	0.030	—	—	—
L175P or A25P	0.21	0.6	0.045	0.080	0.030	—	—	—
L210 or A	0.22	0.9	—	0.030	0.030	—	—	—
L245 or B	0.26	1.2	—	0.030	0.030	c,d	c,d	d
L290 or X42	0.26	1.3	—	0.030	0.030	d	d	d
L320 or X46	0.26	1.4	—	0.030	0.030	d	d	d
L360 or X52	0.26	1.4	—	0.030	0.030	d	d	d
L390 or X56	0.26	1.4	—	0.030	0.030	d	d	d
L415 or X56	0.26	1.4	—	0.030	0.030	f	f	f
L450 or X65	0.26	1.45	—	0.030	0.030	f	f	f
L485 or X70	0.26	1.65	—	0.030	0.030	f	f	f

Steel Pipe Coating and Lining

API 5L LE Liquid Epoxy Coated Line Pipe

Carbon Steel API 5L 3LPE Coated

API 5L PSL2/ PSL1 FBE Coated Pipe

DUCTILE IRON PIPE K-TYPE & C-CLASS

DUCTILE IRON PIPE
K-TYPE & C-CLASS

Diameter		PRESSURE CLASS		THICKNESS CLASS	
Nominal Dia.	External Dia.	Tol. on	Preferred	Preferred class	Nominal Thickness K9 (mm)
DN (mm)	DE (mm)	DE (mm)	'C' class	Nom Thickness (mm)	
80	98	1/-2.7	C40	4.4	6
100	118	1/-2.8	C40	4.4	6
150	170	1/-2.9	C40	4.5	6
200	222	1/-3	C40	4.7	6.3
250	274	1/-3.1	C40	5.5	6.8
300	326	1/-3.3	C40	6.2	7.2
350	378	1/-3.4	C30	6.3	7.7
400	429	1/-3.5	C30	6.5	8.1
450	480	1/-3.6	C30	6.9	8.6
500	532	1/-3.8	C30	7.5	9
600	635	1/-4	C30	8.7	9.9
700	738	1/4.3	C25	8.8	10.8
800	842	1/4.5	C25	9.6	11.7
900	945	1/-4.8	C25	10.6	12.6
1000	1048	1/-5	C25	11.6	13.5

- Note: Preferred 'C' class as per ISO2531/2009

DUCTILE IRON PIPE MECHANICAL PROPERTIES

The hydraulic test pressure of ductile iron pipe is as follows	
Nominal diameter DN (mm)	Hydrostatic test pressure (MPa)
80≤DN≤300	5
350≤DN≤600	4
700≤DN≤1000	3.2
1100≤DN≤2000	2.5

		Centrifugal ductile iron pipe	Ordinary gray cast pipe	Steel Pipe
Tensile strength (MPa)		≥420	150--260	≥400
Elongation (%)	<1000(mm)	≥10	neglect	≥18
	>1000(mm)	≥7	neglect	≥18
Brinell hardness (HBS)		≤230	≤230	about 140
After annealing, the metallographic structure of ductile iron pipe is ferrite plus a small amount of pearlite, and its mechanical properties are good.				

Wall Thickness comparison Type-K vs C-Class

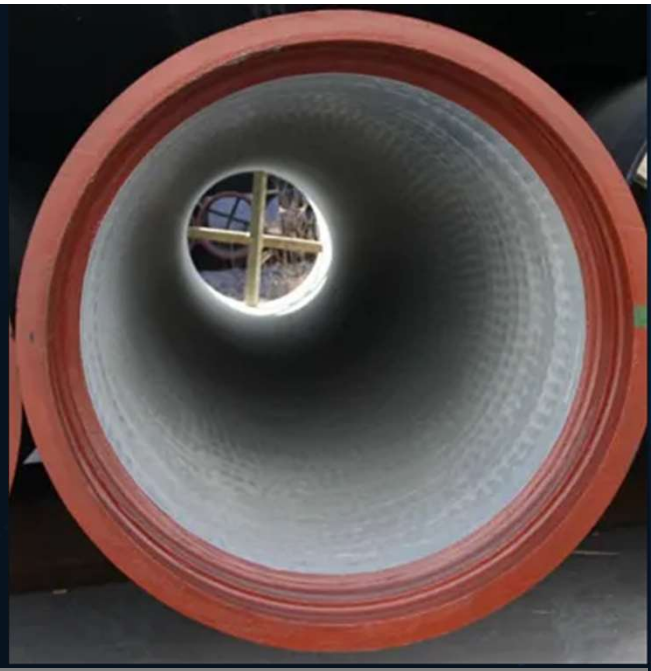
DN 80 and 100	C100
DN 150 and 200	C64
DN 250 and 300	C50
DN 350 and 400	C40

DN	DE [mm]	Pressure Class 'C'						Thickness Class 'K'					
		25	30	40	50	64	100	7		9		12	
		e_{min} (mm)						e_{min} (mm)	PFA (bar)	e_{min} (mm)	PFA (bar)	e_{min} (mm)	PFA (bar)
80	98			3.0	3.5	4.0	4.7	4.7	141	4.7	141	5.6	170.0
100	118			3.0	3.5	4.0	4.7	4.7	116	4.7	116	5.8	145.0
125	144			3.0	3.5	4.0	5.0	4.7	94	4.7	94	6.1	124.0
150	170			3.0	3.5	4.0	5.9	4.7	80	4.7	80	6.4	110.0
200	222			3.1	3.9	5.0	7.7	4.7	61	4.8	62	6.9	90.0
250	274			3.9	4.8	6.1	9.5	4.7	49	5.2	54	7.5	79.0
300	326			4.6	5.7	7.3	11.2	4.7	41	5.6	49	8.0	70.0
350	378		4.7	5.3	6.6	8.5	13.0	4.7	35	6.0	45	8.6	65.0
400	429		4.8	6.0	7.5	9.6	14.8	4.7	31	6.4	42	9.1	61.0
500	532		5.6	7.5	9.3	11.9	18.3	5.2	28	7.2	38	10.2	55.0
600	635		6.7	8.9	11.1	14.2	21.9	5.8	26	8.0	36	11.3	51.0
700	738	6.8	7.8	10.4	13.0	16.5		6.4	24	8.8	34	12.4	48.0

Pressure Classes “C” as per EN 545:2010
Thickness Classes “K” as per EN 545: 2006

		Pressure class (C-classes) = PFA [bar]						
		20	25	30	40	50	64	100
DN	DE [mm]	e_{min} [mm]						
40	56				3.0	3.5	4.0	4.7
50	66				3.0	3.5	4.0	4.7
60	77				3.0	3.5	4.0	4.7
65	82				3.0	3.5	4.0	4.7
80	98				3.0	3.5	4.0	4.7
100	118				3.0	3.5	4.0	4.7
125	144				3.0	3.5	4.0	5.0
150	170				3.0	3.5	4.0	5.9
200	222				3.1	3.9	5.0	7.7
250	274				3.9	4.8	6.1	9.5
300	326				4.6	5.7	7.3	11.2
350	378			4.7	5.3	6.6	8.5	13.0
400	429			4.8	6.0	7.5	9.6	14.8
450	480			5.1	6.8	8.4	10.7	16.6
500	532			5.6	7.5	9.3	11.9	18.3
600	635			6.7	8.9	11.1	14.2	21.9
700	738		6.8	7.8	10.4	13.0	16.5	
800	842		7.5	8.9	11.9	14.8	18.8	
900	945		8.4	10.0	13.3	16.6		
1000	1048		9.3	11.1	14.8	18.4		
1100	1152	8.2	10.2	12.2	16.2	20.2		
1200	1255	8.9	11.1	13.3	17.7	22.0		
1400	1462	10.4	12.9	15.5				
1500	1565	11.1	13.9	16.6				
1600	1668	11.8	14.8	17.7				
1800	1875	13.3	16.6	19.9				
2000	2082	14.8	18.4	22.1				

Note: the figures in bold represent the standard range



Wall Thickness C-Class

Minimum wall thickness for DI pipe as per EN 545 depending on nominal size DN and pressure class

Sizes: 20 1200 mm
Length: 6m or as required
Thickness 2 – 60 mm

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HDPE Double-wall Corrugated Pipe .
Standard ISO4427 IPS/DIPS Sizes
DN225 – DN800 or Custom

AfaK

PERFORMANCE OF HDPE DOUBLE WALL CORRUGATED PIPES

- **Structural Strength: The double wall corrugated design enhances the structural strength of the pipe, providing resistance against external pressures and loads.**
- **Corrosion Resistance: HDPE material ensure corrosion resistance, making the pipes suitable for diverse environmental condition and ensuring a long service life.**
- **Flexibility and Durability: The corrugated structure adds flexibility, allowing for easy installation even in challenging terrains, while maintaining durability for reliable performance.**
- **Smoot Inner Surface: The smooth inner surface reduces friction, promoting efficient water flow and preventing the accumulation of debris within the pipes.**
- **Chemical resistance: HDPE inherent resistance to chemicals makes these pipe for various applications, including the transport of corrosive substances.**

HDPE STEEL FRAMED PIPE

AfaK

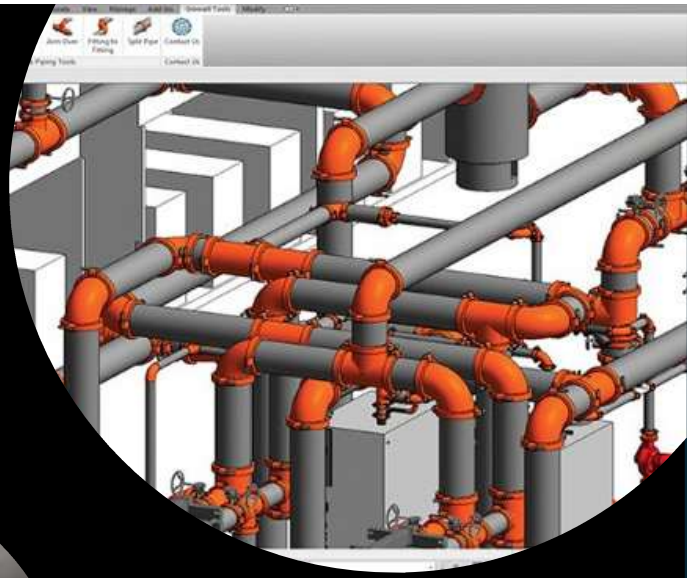
Sizes: 20 – 1100 mm
Length: 6m or as required
Thickness: 2 – 60 mm

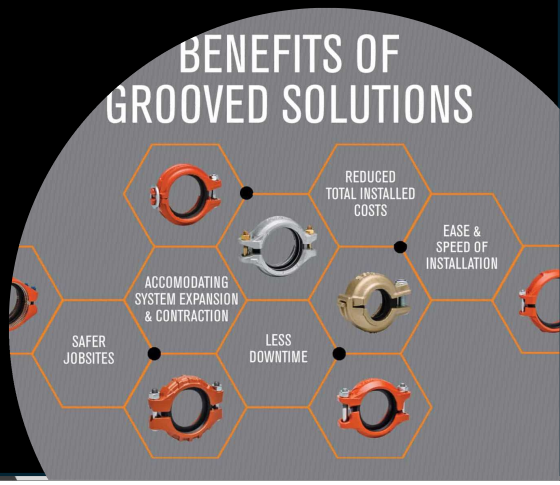
PERFORMANCE OF HDPE STEEL FRAMED PIPE

- **Structural Strength: The steel framed within these pipes provides superior mechanical strength and rigidity, allowing them to withstand higher internal and external pressures compared to standard HDPE pipes.**
- **Corrosion Resistance: the outer HDPE layer offers excellent resistance to corrosion and chemical attacks, protecting the steel frame and ensuring a longer lifespan of the pipe.**
- **Flexibility and crack resistance: Despite the steel reinforcement, these pipes maintain a degree of flexibility aids in resistance to environmental stress cracking.**
- **Abrasive resistance: The inner HDPE layer provides a smooth surface that minimize wear and tear due to abrasive material passing through, making them ideal for transporting solids.**
- **Temperature and impact resilience: These pipes can operate effectively in a range of temperature and are also resistant to impacts, which is crucial for harsh environmental conditions.**

Grooved System

- ❑ Pipe design flexibility.
- ❑ Reduced stress on the piping system.
- ❑ A more compact, inspectable and productive method of installation over other pipe-joining methods such as welding.
- ❑ Conforms to industry practices in industrial building services





AfaK

AFAK SOLAR SYSTEM

- DESIGN
- INSTALLATION
- SERVICE

Solar Solution for each Project

- According to different types of construction sites, installation locations and methods, we can provide solutions for large-scale photovoltaic power stations, general mountain photovoltaic power stations, complex mountain photovoltaic power stations, and floating photovoltaic power stations.

Core Advantages

- The value proposition of our solutions runs through the entire life cycle of power plants.
- We are committed to improving power generation capacity, maximizing equipment service life, improving operational efficiency, and optimizing project economic benefits.

The Afak Solar System

- **Efficient delivery**
  - Deepen the potential of product integration, comprehensively compare the potential with solutions through simulation tools, continuously amplify product advantages, continuously improve the efficiency of power stations, and "fully utilize" every kilowatt-hour.

- **Customized solutions**
  - Provide customized services, including power plant engineering services, site environmental management, and site selection for the integration of power plants with other industrial facilities.

- **Lifecycle Services**
  - Provide full-life cycle customer services such as power station consulting, system design, project application, EPC, operation and maintenance, and acceptance.

The cooperative brands are:

LONGi, Canadian Solar, Jinko, JA Solar, Trina, Tongwei, Huansheng, RISEN ENERGY, SUNGROW, Goodwe, Huawei, Growatt.

It is a multi-brand authorized dealer and an important one of the dealers.

AFAK IRRIGATION SYSTEM

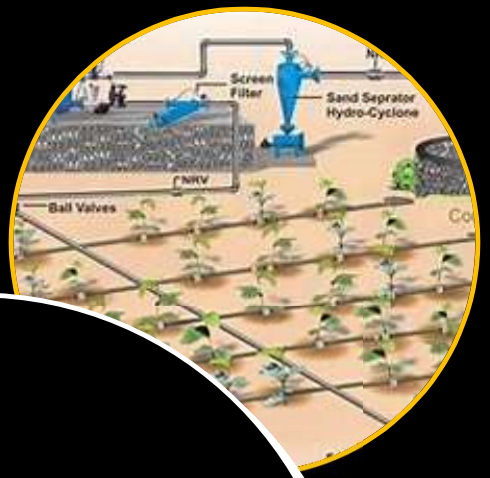
- DESIGN
- INSTALLATION
- SERVICE

AFAK Irrigation

- AfaK Irrigation supplies irrigation products and designs custom irrigation systems for optimal water levels that increase the health and growth of your crop.
- Choose from a variety of sprinklers, nozzles, pipes, pumps, filters, drip tape and fittings.

AFAK SPRINKLER REPAIR & INSTALLATION COMPANY

- Locally owned and operated, We offer sprinkler system repair and installation throughout the KSA area.



Drip Irrigation System Layout

AfaK

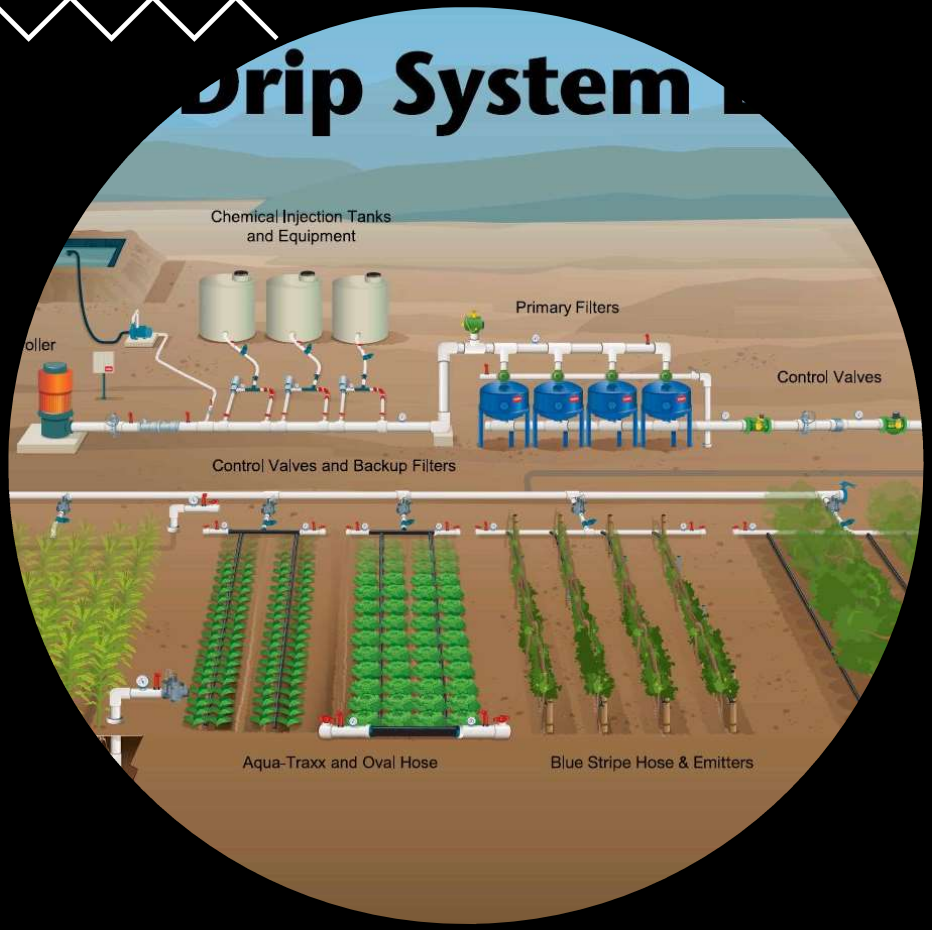
As you know, supplying the right amount of water, at the right time is the most important thing you can do to make sure that you have healthy landscaping all year round.

Unfortunately, relying on the weather to supply this all-important liquid is really not a good idea, especially in the KSA.

If you want healthy landscaping, you are going to need some form of the irrigation system. That's why services for irrigation systems AFAK are essential.

That's where we come in.

SPRINKLER SYSTEMS & IRRIGATION



At Afak Irrigation, we specialize in the design and installation of irrigation systems for both commercial and residential property owners throughout the Kingdom Of Saudi Arabia and the surrounding areas.

If your irrigation system is not working the way it should, give us a call and we will come out and evaluate the situation and solve the problem quickly and professionally.

Using the latest technology, our expert team offers sprinkler systems Afak that are reliable and worry-free.

We also work with your current landscaping to create a system that will meet your needs today as well as your future needs.

We offer a full range of options for fully automated irrigation systems and rely on the most up-to-date technologies and equipment so that our staff of experts can provide our clients with a completely worry free and reliable system that will continue to operate the way it should for years to come.

SPRINKLER SYSTEM REPAIR SERVICES

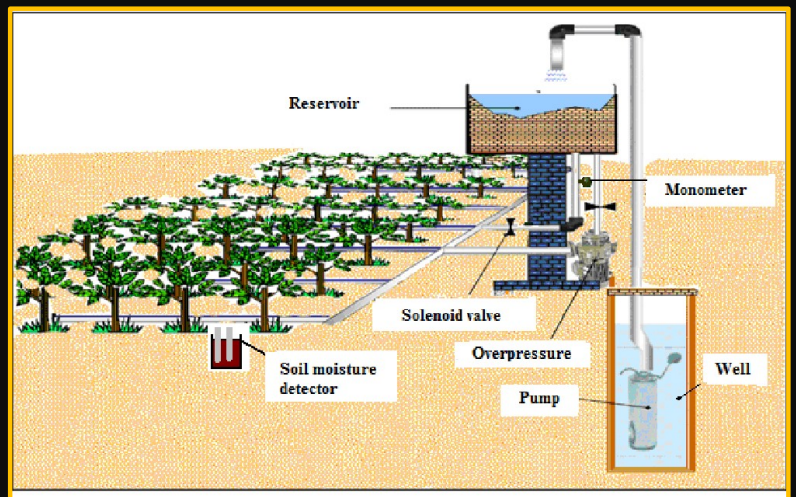
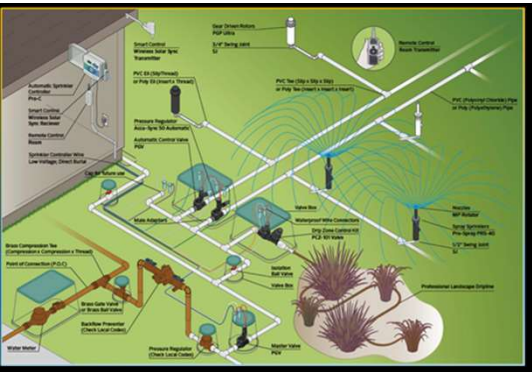


Fig. 1. Drip irrigation station

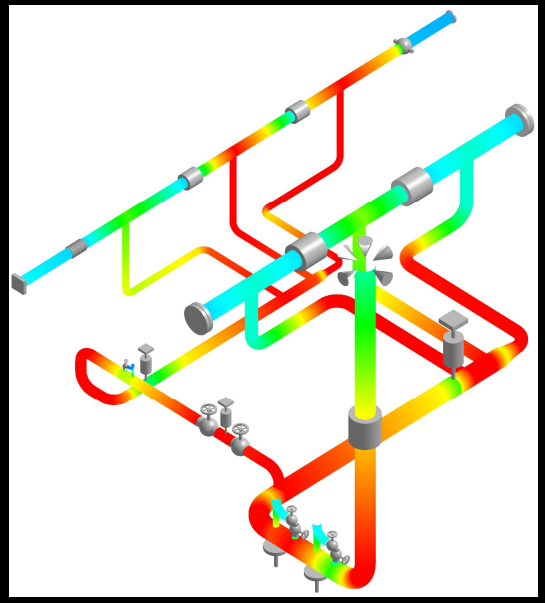


Our Services

We can help optimize your system's efficiency and reduce unnecessary water waste.

- Cracked or damaged sprinkler heads
- Low pressure in some areas or the complete system
- Sprinkler heads not popping up
- Water bubbling up or pooling in an area
- Pipes that are known to be crushed or leaking
- Backflow valve concerns
- Rain Sensor malfunctions
- Timers not operating correctly
- Zones not working
- Issues with the sprinkler box

Pipe Stress Analysis



What is pipe stress analysis

Pipe stress analysis is a testing method that examines a piping system's behavior under different loading situations.

As such, it's able to analyze how the material responds to pressure, temperatures, fluid and supports, thus helping engineers:

- ❑ Observe the pipe's flexibility and stiffness
- ❑ Determine values such as maximum stresses, forces, displacements and restraints
- ❑ Monitor the limits of stress in piping components and their correspondence to applicable standards
- ❑ Decide on the right support systems to ensure their loads and movements are correct and safe avoiding unsuitable materials that do not support the necessary loads and pressures
- ❑ Notice potential disengagements from support structures and pipes
- ❑ Foresee how mechanical vibrations, seismic loads or acoustic vibrations might influence pipe operations
- ❑ Guarantee pipes are leak-proof to prevent leakage
- ❑ Select appropriate materials that meet strength and durability requirements

Main types of piping stresses

Certain pressure, temperature and vibration conditions, as well as occasional loads, all have an impact on pipe systems. As such, the main piping stresses can be divided in 5 categories:

- Hoop stress: a type of uniform pressure applied internally or externally, it can have an impact on the pipe's diameter and wall thickness
- Axial stress: caused by factors such as thermal or pressure expansions, as well as applied forces that result in the pipe's restrained axial growth. As different materials react differently to this type of stress, pipe stress analysis remains crucial to detect this issue.
- Bending stress: it originates by certain body forces that can be concentrated (such as those related to valves) or occasional (such as the ones created by atmospheric forces, including seismic movements or extreme wind events). Bending stress can also be detected as forced displacements that are generated by the growth of other equipment and piping that ultimately impacts the analyzed pipe.
- Torsional stress: caused by body forces that bring about rotational moments around the pipe axis.
- Fatigue stress: this is created by the combination of continuous stresses that may impact certain pipe systems.
- Additionally, it's also important to understand the three categories of loads that influence pipe stress:

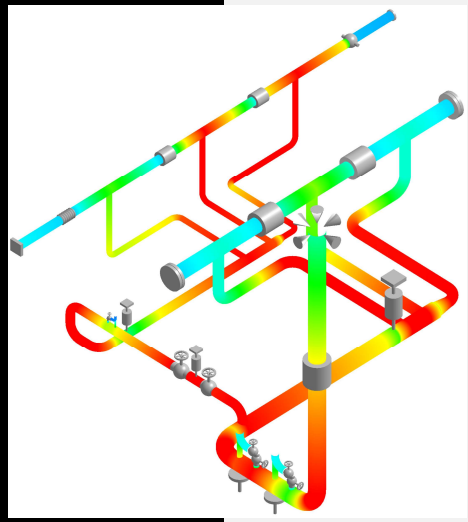
- Primary or sustained stresses, which account for 55% of the standard allowable stress following ASME standards
- Displacement stresses, which should be kept between 80% to 90% of allowed ASME requirements and can be reduced by adding flexibility to the piping system
- Occasional stresses, originated by one-time events (typically related to seismic movements, extreme wind events or relief-thrust loads). ASME codes allow for certain increases in the event of these stresses, including allowing a 15% increase if the event lasts less than 8 hours and less than 800 hours per year (wind-related) and a 20% increase if the event lasts less than 1 hour and less than 80 hours per year (seismic movements and relief thrust).

Objectives of Piping Stress Calculations

- The first goal of piping stress analysis is to be able to guarantee the piping system presents structural integrity, considering the carrying fluid and potential likely failures in the piping's life cycle. In order to do so, the stresses should be kept below the codes' recommendations mentioned above.

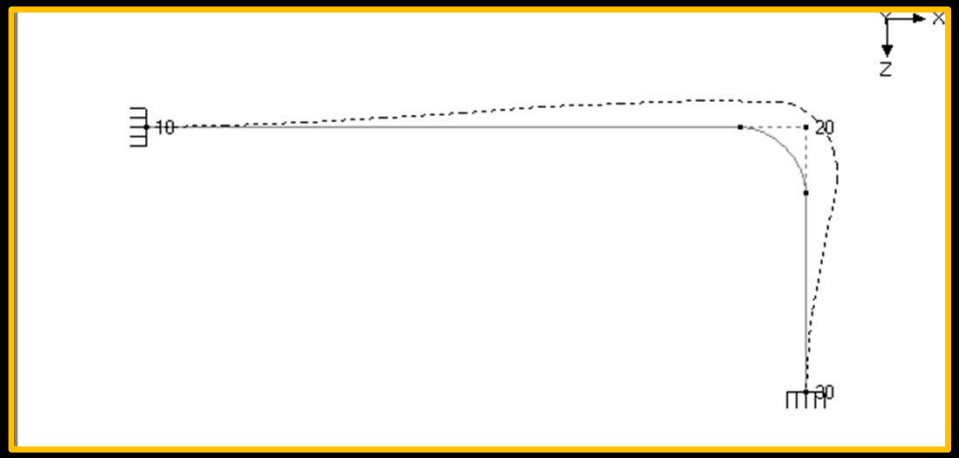
- Secondly, pipe stress calculations can guarantee operational efficiency for the pipe network. This includes avoiding issues such as leaking, sagging or undesired displacements, but also certain operations that lead to optimizing design such as unnecessary excess flexibility, choosing the right supporting structure, piping connections and joints.

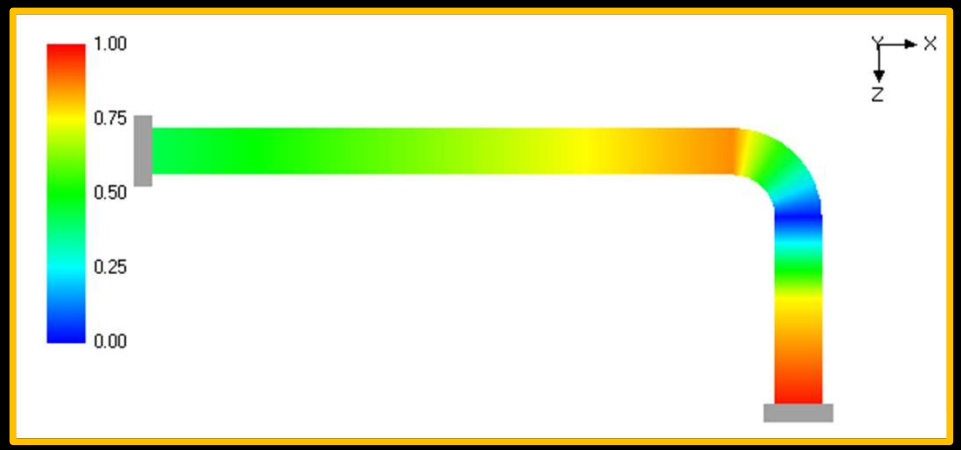
Standards

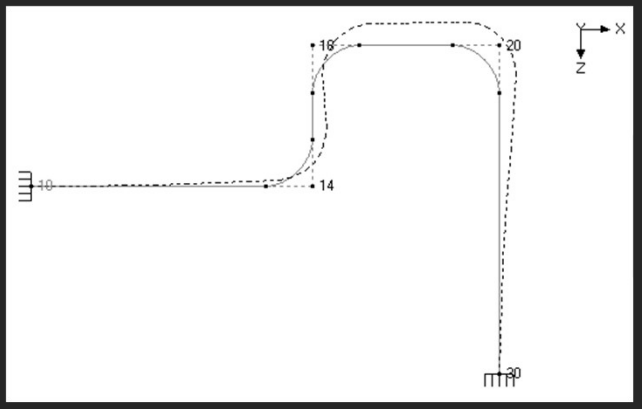


- ASME 31.1 – Power Piping, B 31.3 (Process Piping), 31.4 (Hydrocarbon pipeline), 31.8 (Gas Pipeline) 31.12 (Hydrogen piping and pipeline)
- ASME Section VIII – Pressure Vessels
- API 610 (Centrifugal Pumps), API 676 (Positive Displacement Pumps), API 617 (Centrifugal Compressors), API 618 (Reciprocating Compressors)

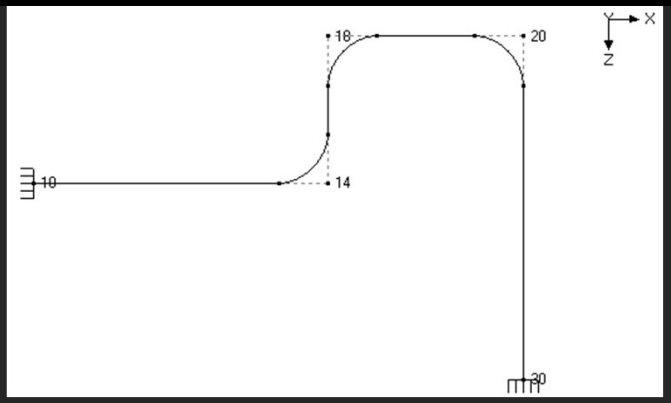
After modeling this layout in CAEPIPE, upon analysis, you will find that the pipe between nodes 10 and 20 grows thermally to the right towards node 20, while pipe between nodes 30 and 20 grows up towards node 20, as illustrated.

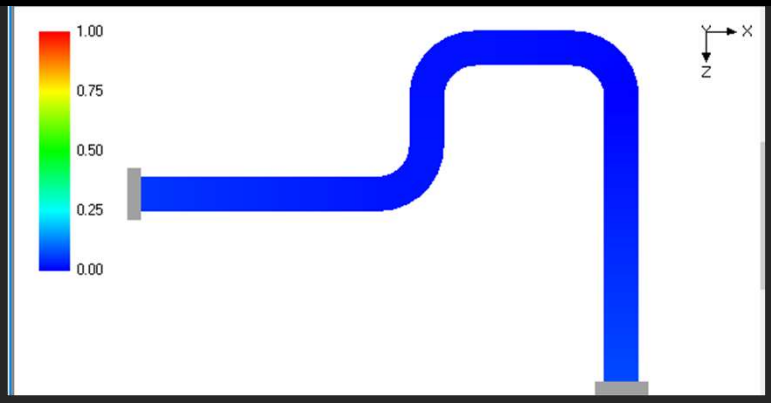


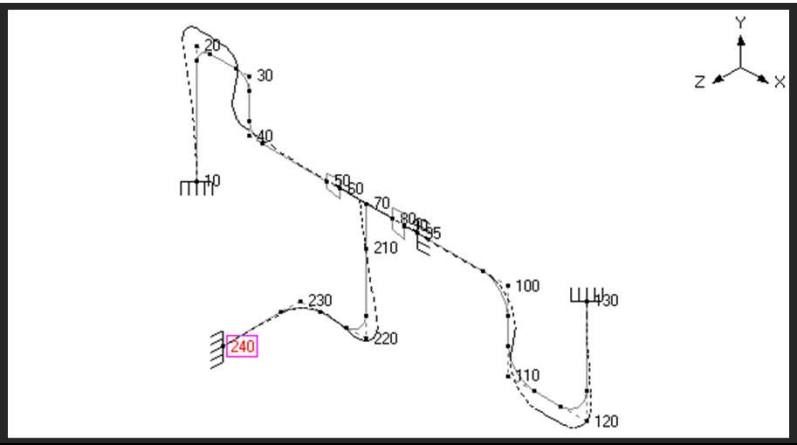


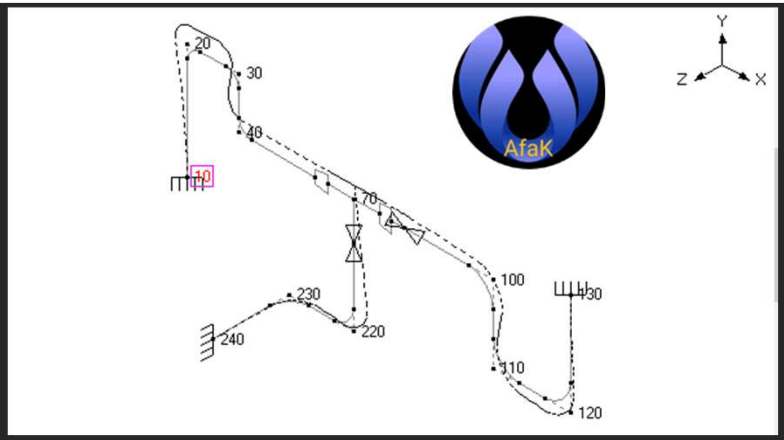


a revised layout with a loop, introducing two additional bends at nodes 14 and 18, thereby making the layout more flexible. So, thermal growth of X-directional pipes between nodes 10 and 14 and then between 18 and 20 as well as the growth of Z-directional pipe between nodes 30 and 20 are absorbed by the three bends at nodes 14, 18 and 20, as seen in Fig. 1E. The corresponding stress contour plots for thermal and sustained load cases are shown in Fig.1F and Fig. 1G, confirming code compliance

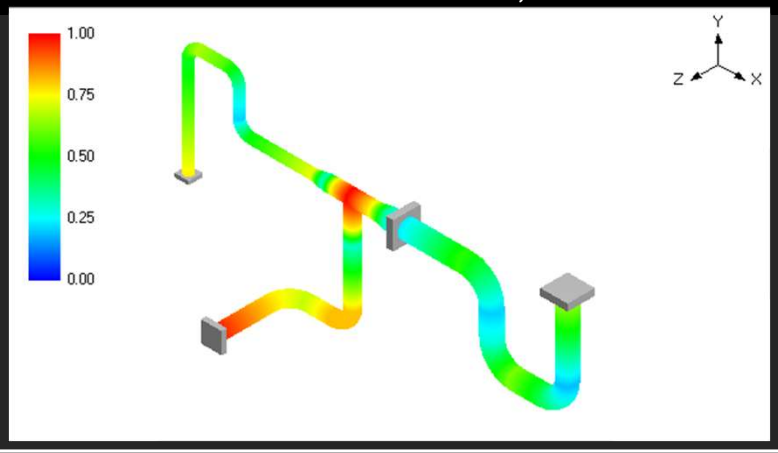


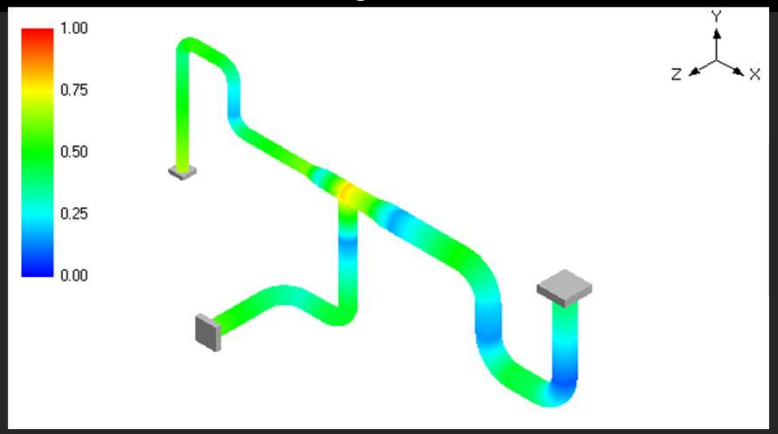






the same piping system with one axial restraint at 95 (replacing the intermediate anchor at node 95) and another at node 210 - the one at node 95 splits and directs thermal growth towards the 4" and 8" loops and permits the horizontal line to move up in +Y-direction at node 70; the second one at node 210 splits the thermal growth of the vertical riser (between nodes 220 and 70). The resulting deformed geometry plot in Fig. 3E shows a more flexible system, which produces smaller forces and moments, and hence stresses at the equipment nozzle node 240 and welding tee node 70.





Major Projects / Building / Stress Analysis

We provided:

- ❑ Carbon steel pipe and grooved fittings for HVAC.
- ❑ Galvanized pipe and grooved fittings for Fire protection system.
- ❑ Piping Stress analysis study for both systems, including risers and pumping stations.

DAMAC EXECUTIVES

3B+G+4 Podiums+1 Recreational+ 19 Commercial Tower at TECOM, Dubai

- ✓ Client: Damac Properties Company L.L.C.
- ✓ Architect/Consultant: Engineering Consultants Group (ECG)
- ✓ MEP Consultant: Ian Banham and Associates
- ✓ Main Contractor: Target Engineering
- ✓ Value: AED 14,980,000.

DOME TOWER

5B+G+39+Mech+R Office and Commercial Tower in Jumeirah Lake Towers, Dubai

- ✓ Client: Mr. Eisa Bin Nasser Bin Abdullatif Alserkal
- ✓ Project Management: Clifton Cloney Group
- ✓ Architect/Consultant: Dimensions Engineering Consultant
- ✓ Main Contractor: Construction & Reconstruction Engineering Co.
- ✓ Value: AED 43,977,000.00

FORTUNE TOWER

4B+G+34 Commercial Tower at Jumeirah Lake Towers, Dubai

- ✓ Client: Fortune Investment L.L.C
- ✓ Architect/Consultant: Dimensions Engineering Consultants
- ✓ MEP Consultant: Dimensions Engineering Consultants
- ✓ Main Contractor: IJM Construction (Middle East) L.L.C.
- ✓ Value : AED 23,500,000.00

DAMAC PARK TOWER

3B+Podium+40+R Twin Tower at DIFC, Dubai.

- ✓ Client: Damac Real Estate Asset Management Co. Ltd.
- ✓ Architect/Consultant: Engineering Consultants Group (ECG)
- ✓ MEP Consultant: Ian Banham & Associates
- ✓ Main Contractor: Shapoorji Pallongi Mideast L.L.C.
- ✓ Value: AED 121,600,000.00

PRIZM TOWER

3B+G+M+Podiums+30 Floor Commercial Building in Business Bay,

- ✓ Client: Credo Investments FZE
- ✓ Project Management: Hamilton Project Management
- ✓ Architect/Consultant: Dewan Al Emara - Architects & Engineering / AREX
- ✓ MEP Consultant: Ian Banham & Associates:
- ✓ Main Contractor: Commodore Contracting L.L.C.
- ✓ Value: AED 45,250,000.00

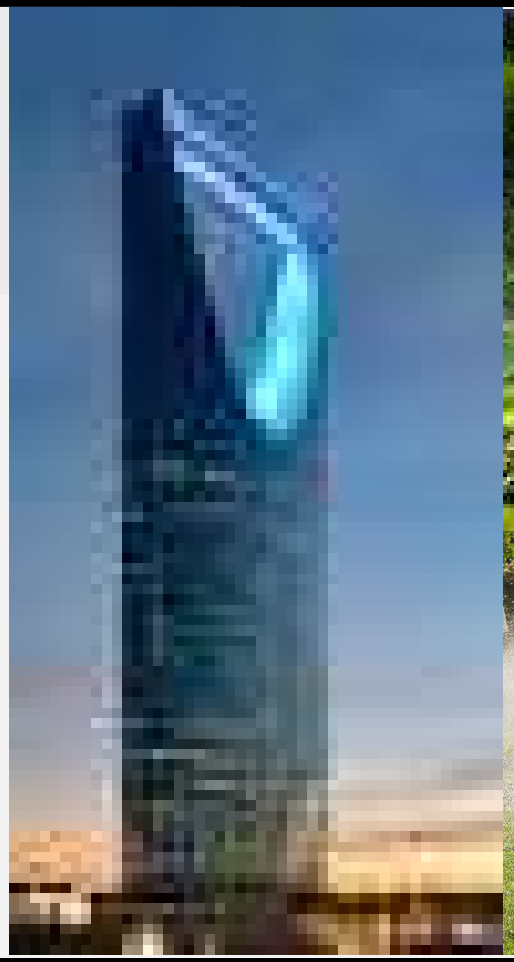
Major Projects:

Kingdom Trade Centre

OUR SCOPE OF WORK:

- ❑ Supplied Complete Grooved Piping System for Fire Protection and HVAC .
- ❑ Accomplished Stress analysis for all building Risers.

- ❑ At a cost of about €400 million, the Kingdom Centre was built by a joint venture between Impregilo, one of Salini Impregilo's predecessors, and Saudi El Seif Engineering Contracting.
- ❑ Built with reinforced concrete, the structure's central tower is 30-storeys high, while the parabolic opening on top of it consists of a 120-metre tubular steel structure. Atop this opening is a cross bridge with an observation gallery offering a panoramic view of the city. When it opened in 2002, the Kingdom Centre was the tallest building in Riyadh, triple the height of the city's tallest structure at the time: the 100-meter NCCI insurance office building.



Major Projects / Al Faissaliyah Tower

- The Al Faisaliah Tower is a commercial skyscraper and complex located in Riyadh, Saudi Arabia.
- This tower is 267 meters high with 55 stories and is famous for being the first skyscraper to be built in Saudi Arabia.
- The Al Faisaliah Complex was designed by the well-known British Architect firm, Foster + Partners.

OUR SCOPE:

- Supplied Complete Grooved Piping System for Fire Protection and HVAC .
- Accomplished Stress analysis for all building Risers.
  - Consultant: Buro Happold
  - MEP Contractor: Saudi Bin Ladin

OTHER PROJECTS

LN #	Project name	location	Contractor	Owner	Aplication	Scope	Grade	Sizes
1	KGP - Aramco	Dammam, KSA	Aramco	Aramco	Oil	Steel Pipe	B	DN0900 - DN0600
2	Breeman Project	Jeddah, KSA	Al rafi3a Contracting	NWC	Water	Pipe fittings	K12 - K14	DN1400 - DN1500 - DN1600 - DN2000
3	Breeman Project	Jeddah, KSA	Al rafi3a Contracting	NWC	Water	DI pipe	K9	DN0400 - DN1400 - DN1500 - DN1600 - DN2000
4	Madinah road project	Jeddah, KSA	Bin Dubais	NWC	Water	DI pipe	K9	DN400
5	B99	Riyadh, Ksa	Saudi Tumpane	NWC	Water	Steel Pipe / Fittings	X52	DN0200 - DN0250 - DN0500 - DN0700 - DN0800 - DN0900 - DN1000 - DN1200 - DN1400 - DN 1600
6			Al Jawdah	NWC	Water	DI pipe	K9	DN 400
7	Mash3ar Project	Jeddah, KSA	Bin Dubais	NWC	Water	DI pipe	K9	DN0800
8	Sabkha	SAbkha, KSA	BinJarallah	NWC	Water	Di Pipe	K9	DN0600 - DN0800
9	SWCC	Saudi Arabi	AMG	NWC	Water	Steel Pipe	X65	DN1500
10			Al Dhami Co.	NWC	Water	Steel Pipe	X	DN0500
11	Sad Al marwani	Jeddah, KSA	BinJarallah	NWC	Water	Steel Pipe / grooved fittings	X	DN0400
12		Dammam, KSA	Khaled Sultan Al Hajri	NWC	Water	Steel Pipe	X	DN0500
13	Jabal Noor	Makkah Al Mokarammah	Sawa3ed Makkah	NWC	Water	DI Pipe	K9	DN0500
14	Ashirat/ Madina Project	Al Madinah Al Monawarah	Al Abab Contracting	NWC	Water	DI pipe	K9	DN1000
15	Hamra Al Assad	Al Madinah Al Monawarah	Aziz Co.	NWC	Water	DI Pipe	K9	DN0500
16	TGNW	Riyadh, Ksa	Aziz Co.	NWC	Water	DI Pipe / Fittings	K9	DN0200 - DN0300 - DN0400
17	SabihiYa Project	Hail	Ishrakat for Contracting	NWC	Water	DI Pipe	K9	DN0300
18	Alganfdah	Al Gonfodah	Al Jazea	NWC	Water	Grooved Fittings	Couplings	DN0500
19	Hamriya to Sahiba	Hail	Al Shmasy	NWC	Water	DI Pipe	K9	DN0250 - DN0300
20	Hail Villages	Hail		NWC	Water	Steel Pipe	X65 - X56	DN0600 - DN0900

OTHER PROJECTS

Ln.	Project Name	Location	Year	Consultant	Contractor	Client	Application	Products
1	O 14 Tower Business Bay	Dubai	2008	ERGA Progress Engineering	Al Bonian International		F.P	National / TSP
2	Fortune Tower	Dubai	2008	Dimensions Engineering	Omega Engineering LLC	Executive Holding	F.P/CW	National / TSP
3	The Dubai Mall	Dubai	2008	Al Arabia	Meinhardt	EMMAR	CW	National
4	First Gulf Bank	Dubai	2008	Morgindi	ETA		F.P	National
5	Sports city No2. No5. Ressidential Building	Dubai	2008	QHC	ETA	Falak Properties	F.P	National
6	Tabreed Cooling Plant Spinneys AD 11	Abu Dhabi	2007	SNC Lavalin	Thermo LLC	Tabreed National Central Cooling comp.	F.P	National
7	Injazat	Abu Dhabi	2007	APS Gulf	Thermo LLC	Al Dar	F.P	National
8	Grossvenor Business Center	Dubai	2007	Arch Group	ETA	MM. Sheik Mohammed	C.W/F.P	National / TSP
9	Construction of Cold Store	Dubai	2007	OSOOL	Dynamo ElectroMechanical	IRIS Flower & Plant	C.W/F.P	National / TSP
10	G+2B+18 Project	Dubai	2007	Gulf International	Dynamo ElectroMechanical	Sheik Majid Al Kasimi	C.W/F.P	National / TSP
11	Churchil Tower - Emirates National Investment	Dubai	2007	IAN Banham Associates	Omega Engineering LLC	ENI		National
12	Tabreed Cooling Plant	Abu Dhabi	2007	SNC Lavalin	Thermo LLC	Tabreed National Central Cooling comp.	F.P	National
13	Motorcity Paddlocks Carriage Extension	Dubai	2007	WSP	Thermo LLC	Union Properties	F.P	National
14	Motorcity-Maintenance Hanger	Dubai	2007	WSP	Thermo LLC	Union Properties	F.P/C.W	National / TSP
15	Emirates Bank	Dubai	2007	Waterman	ETA	Emirates Bank	F.P/C.W	National
16	Burj Dubai Phase III	Dubai	2007	EMMAR	ETA	ETA	F.P	National
17	Petrofac International	Sharjah	2007	Consult Air	ETA	Sheik majid bin hamad bin AlQassmi	F.P	National
18	Burj Dubai Old Down	Dubai	2006	Allied	ETA	EMMAR	F.P	National
19	Eleven Towers-Business Towers	Dubai	2006	IAN Ban Ham Associates/ Dar Consult	ETA	Dubai Properties	C.W	National
20	Al Muteena Building	Dubai	2006	Al Hassmi	ETA	ETA Star	F.P	National
21	P & L Warehouse	Dubai	2006	Design Concept	ETA	Emirates Airlines	F.P	National
22	Expansion of A/D Paper Mill & A/D Carpet Factort	Abu Dhabi	2006	Ian Banham & Rice Perry Ellis	ETA	ADNOC	F.P.	National
23	Old Town Commercial Island	Dubai	2006	RPW	ETA	Emaar	F.P	National
24	Al Ghurair Project	Dubai	2006	RBW	ETA	ETA Star	C.W	National
25	Dubai Int'l. Airport Terminal 1 Expansion - AX431	Dubai	2006	Dar Al Handash	Thermo LLC	Department of Civil Aviation	C.W.	National
26	Office Bldg. Phase 1 on Plot # 500.662	Dubai	2006	Shadid Engineering Consultants	Al Bonian International	Office Bldg. Phase 1 on Plot # 500.662	FP	National
27	Over Flow Centre	Dubai	2006	Design Concept	ETA	Over Flow Centre	FP	National
28	Schulumberger MLC-MEA Learning Center	Abu Dhabi	2006	Morgan Consulting Engineers	Thermo LLC	Schulum Berger	CW	National
29	Capital Towers	Dubai	2006	RMJM	ETA	Capital Towers	CW/FP	National
30	Jumeirah Lake Tower	Dubai	2006	Khatib & Alami	Al Hani Gulf Contracting Co. (L.L.C.)	Jumeirah Lake Tower	FP	National
31	Rose Rotana Suites	Dubai	2005	Khatib & Alami	Thermo L.L.C.	Rose Rotana Suites	CW/FP	National
32	Arazanah Building at Sas Ad Nah Khl	Abu Dhabi	2005	ECG		Atnoc	FP	National
33	Emirates Inst. For Banking & Fin. Studies	Abu Dhabi	2005	Consult Engineers & Project Managers	Thermo LLC	Emirates Inst. For Banking & Fin. Studies	FP	National
34	CUC 4	Dubai	2005	Dar Al Handasah	BK Gulf	Dubai Intl Airport	FP	National
35	American Hospital	Dubai	2005	Turner Construction International	Thermo LLC	Mohamed & Obeid Al Mulla L.L.C.	FP / CW	National
36	Burj Dubai Towers	Dubai	2005	Hyder consulting	ETA	Emar	FP	National
37	Ramez Hypermarket	Dubai	2005	KAD	Omega Engineering	Amana Steel	FP / CW	National
38	MBC Building	Dubai	2005		Omega Engineering	MBC	FP	National
39	Water Front	Dubai	2005	Ian Banham & Associates	Thermo LLC	Emar	FP	National
40	Sheikh Mubarak Tower	Abu Dhabi	2005	Ian Banham & Associates	Thermo LLC	Shk. Mubarak Bin Moh'd Al Nahyan	FP / CW	National
41	Ministry of Foreign Affaires	Abu Dhabi	2005	Architectural & Engineering Consultants	Thermo LLC	MOFA	FP / CW	National
42	Jumeira Beach Residences 3 (JBR 3)	Dubai	2005	Arenco	Thermo LLC	Emar	FP / CW	National
43	Jumeira Beach Residences (JBR)	Dubai	2005	WS Atkins	ETA	Emar	FP	National
44	Ajman Commercial Bank of Dubai	Ajman	2005	Ian Banham & Associates	Thermo LLC	Com. Bank of Dubai	FP / CW	National
45	AX 404 Air Show Expansion	Dubai	2005	Dar Al Hadasah	Thermo LLC	Dubai Intl Airport	FP / CW	National
46	Al Nasr Twin Tower	Qatar	2005	Qatar engineering Association	OITCThermo	Mohammed Al Nasr	FP / CW	National
47	Green Community	Dubai	2004	Khatib & Alami	Thermo LLC	Union Properties	FP	National
48	Ibn Batouta Mall	Dubai	2004		ETA		FP	National
49	Dubai International Airport Parking	Dubai	2004	Dar al Handasah	Juma al Majid	Dubai Intl Airport	FP	National