

HDPE STRUCTURE WALL PIPES

Gravity & Conduit Applications



Kuwait International Advanced Industries Company (K.S.C.C)
الشركة الكويتية العالمية للصناعات المتطورة (ش.م.ك.م.)



MADE IN KUWAIT

www.kiaico.com

THE COMPANY

FIRST HDPE CORRUGATED PIPE FACTORY IN KUWAIT



Kuwait International Advanced Industries Company K.S.C.C. (KAI) was established in 1998. We at KAI manufacture an extensive range of products for both industrial and domestic applications. Having been a key player in the market for over a decade, KAI's products continue to lead by example in keeping up to date with the increasing demands of the modern world. Over the years, our 72,000 m² facility has produced an increasing number of different products to cater and to satisfy the majority of our customer demands.

Initially exclusively a pipe manufacturing facility, KAI now manufactures a wide array of plastic products ranging from varying piping and ducting applications, public and residential manhole systems, water storage tanks, road safety barriers, and other custom fabricated products and solutions.

Locally manufactured, our products are a result of the latest technology and machinery and are made of the highest quality of raw materials. By adhering to the technical requirements of internationally recognized standards, our products enjoy a proven regional track record of excellence.

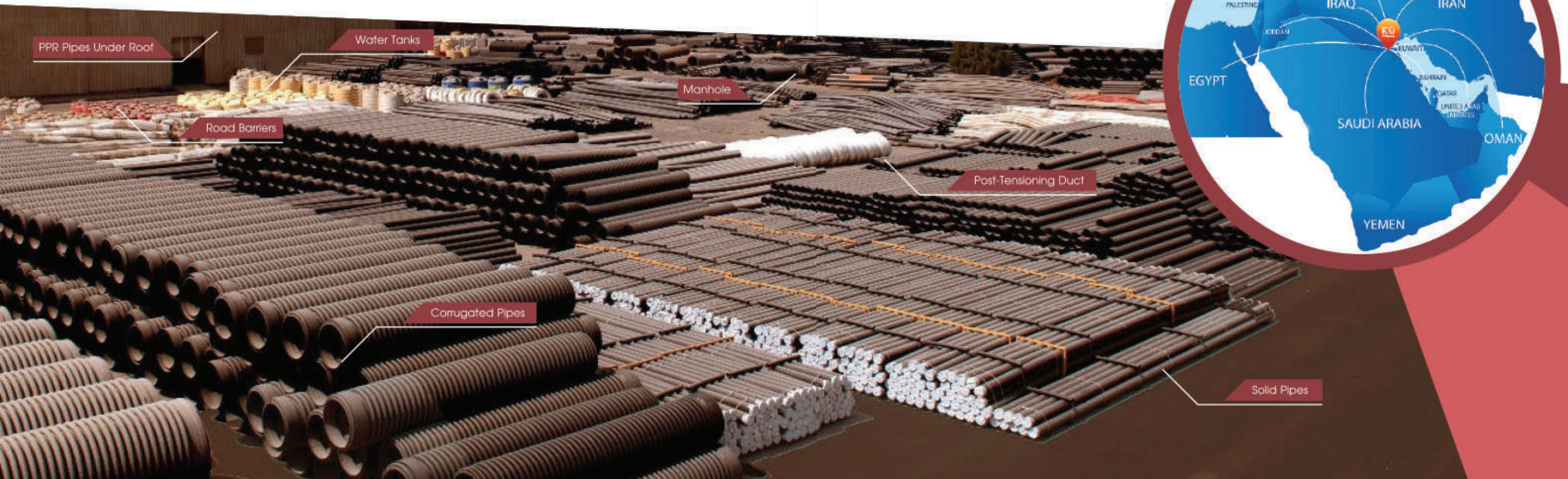
OUR REACH

KAI's ever expanding reach caters to both emerging and developed markets throughout most of the MENA region. KAI's aggressive development plans are consistently seeking feasible opportunities for expansion. Our superior brand, coupled with our flexible marketing strategy, yield a guaranteed result of customer satisfaction.

OUR VISION

KAI's vision has always been to become the partner of choice in the communities where we operate in. A major milestone towards maintaining this ambition is to ensure seamless transition between sales and dispatch.

Not only do we deliver our products in an orderly and time efficient manner, they must be packaged in a way that is deemed convenient by our valued clients.



QUALITY CONTROL

Since inception, our philosophy has been to work towards diversifying our business and expanding our capabilities in order to provide greater value to the communities and the countries where we operate.

Identifying, assessing, and delivering superior products with potential for future growth and value creation has always been a key ingredient of KAI's strategy.

We pride ourselves on delivering the highest quality products derived from the highest grade of raw materials. Our in-house lab ensures that our standards are never compromised.

KAI has a comprehensive Quality Control system that monitors every stage of the manufacturing process, from receipt of raw material to delivery of product. KAI is ISO 9001:2015 certified and is regularly audited by outside parties for compliance to this standard.

All KAI personnel are responsible for maintaining high quality standard. KAI is striving to continuously improve at all levels. Our in-house lab regularly adds new testing capabilities to ensure that KAI's products meet the requirements of relevant international standards.



KAI In-house Lab is well equipped with modern equipment's capable to perform necessary test recommended by the manufacturing standards. All the equipments are from reputed suppliers as well they are calibrated regularly.

KAI products are continuously monitored at every stage of manufacturing.

HDPE STRUCTURE WALL PIPES

Gravity & Conduit Applications

KAI is the first manufacturer in Kuwait of thermoplastic HDPE Corrugated Doublewall Pipes. These pipes are produced from natural resources originated in Kuwait oil industry.

KAI Gravity Pipes are produced in accordance with International Specification EN-13476. The pipes have two layers. The outer layer is corrugated to enhance pipe stiffness while reducing weight and cost. The inner layer is smooth to enhance flow efficiency and lower operational cost.

HDPE pipes have long been the choice in the USA and Europe for both Storm and wastewater systems. HDPE continues to replace other piping materials such as GRP, concrete, and clay pipes. It can also replace conventional plastic pipes.



HDPE STRUCTURE WALL PIPES



They are rapidly replacing more primitive systems such as GRP, concrete, and clay pipes, due to both their comprehensive advantages and finer performance levels.

HDPE structure wall pipes provide great solutions to both new and existing infrastructural systems. They consist of an outer corrugated layer, designed to enhance pipe stiffness, absorb external load, and reduce overall weight. The inner layer however comprises of a smooth layer, designed to maximize flow efficiency and minimize friction. HDPE pipes have long been and continue to be the preferred choice world wide.

Advantages

KAI's HDPE Corrugated pipes have numerous advantages.

- Lightweight
- Easy to install
- Highly adaptable to existing systems
- Resistant to corrosion and abrasion
- Resistant to UV rays and chemicals
- High Impact strength
- Optimum hydraulics
- Low running and maintenance costs
- Can be telescoped for transportation & storage (may be stored up to 3m high)
- Environment Friendly, can be recycled
- Long life

Applications

KAI Corrugated pipes can be used for a wide range of applications:

- Storm, rain, and melt-water systems
- Sewers
- Culverts
- Drainage
- Sleeves
- Cable and A/C ducts
- Post-tensioning system
- Subsurface Drainage
- Gravity Applications
- Perforated pipes

RAW MATERIAL

KAI Corrugated Pipes are comprised of premium quality virgin high density polyethylene (HDPE) material. The HDPE material is mixed with a master batch additive in order to provide the finished product with enhanced added characteristics such as UV protection and custom color preferences.



Annular Profile (A)

KAI Pipes ranging from sizes 100mm – 1200mm are referred to as Corrugated pipes.

Spiral Profile (B)

KAI Pipes ranging from sizes 1400mm – 2400mm are referred to as Corrugated Spiral pipes, or simply Spiral pipes.



(B)





DIMENSIONS AND STANDARDS

SIZE

KAI Gravity Pipes are available in sizes ranging from 100mm to 1200mm (Nominal Inside Diameter) and are manufactured in accordance with the European Standard EN - 13476. The ring stiffness class of these pipes is 8kN/m² for sizes 100mm - 900mm, and 4kN/m² for sizes 1000mm and 1200mm.

LENGTH

Plain-ended pipes are available in unit lengths of 6 -12m or more
Integral bell with spigot pipes come in nominal lengths of 6

Corrugated Pipe

Nominal Diameter Ø (mm)	Average Inside Diameter (mm)	Average Outside Diameter (mm)	Stiffness (KN/M)
100	96	111	8 KN/M ²
104	104	120	
150	146	169	
200	202	241	
250	251	300	
300	302	358	
350	351	417	
400	401	481	
500	501	596	
600	601	716	
700	702	829	4 KN/M ²
800	796	928	
900	901	1,076	
1,000	995	1,151	
1,200	1,193	1,365	

KAI RECOMMENDS JOINTING OF THE KAI CORRUGATED PIPES BY SEAL AND INTEGRAL CUFF JOINTS OR DOUBLE SOCKET JOINTS.

Integral Cuff Joint With Rubber Seal / Gasket

Integral cuff joints have a bell at one end and a spigot at the other end. The technique is a push fit method with the seal made of a high quality EPDM, specifically designed to suit the pipe (Type A). For (Type B) seal is designed to be placed on the cuff.

DOUBLE SOCKET JOINT

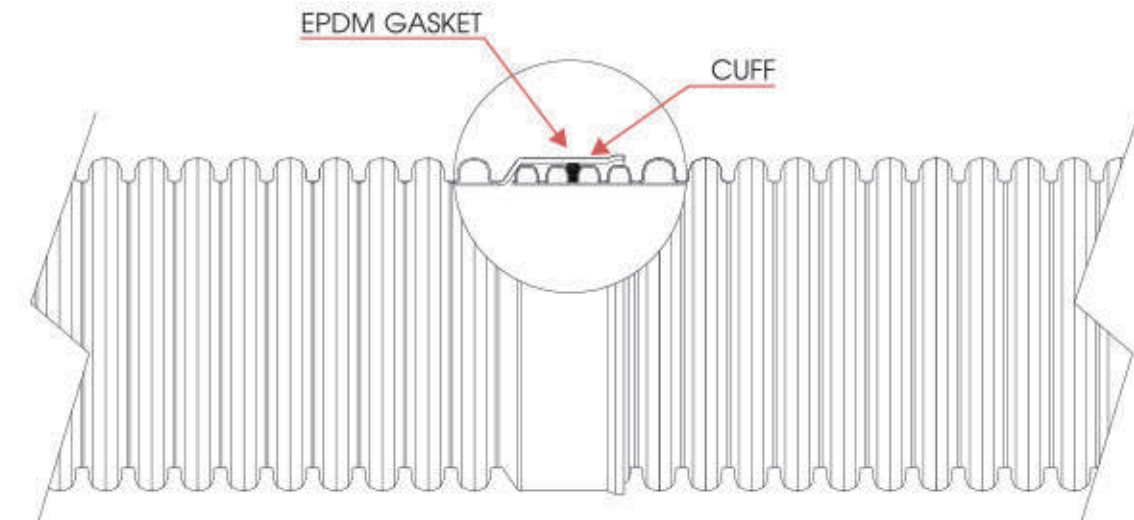
Double Socket Joints, (for repair and maintenance), can be used with a pair of specifically designed EPDM rubber seals to match the normal corrugations of the pipes and to provide a leak tight join.

Spiral Pipe

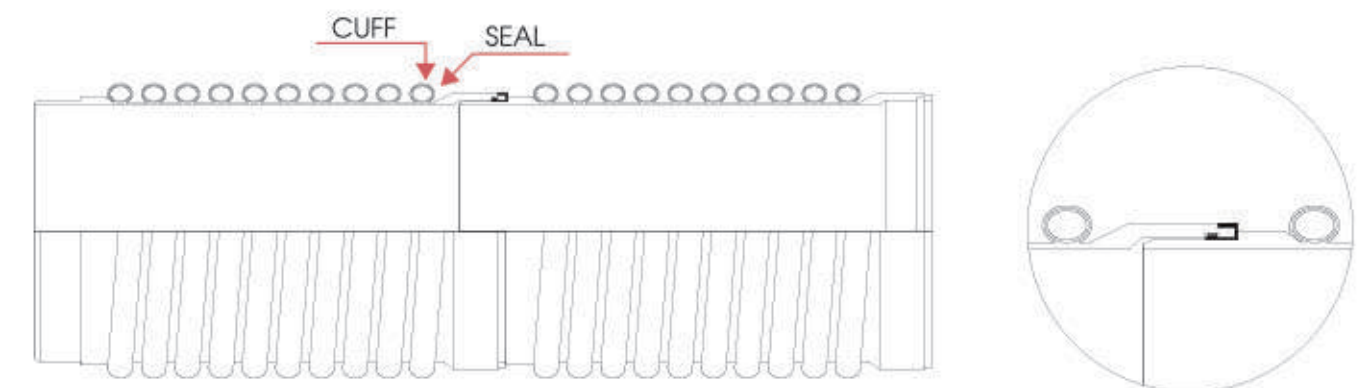
Nominal Diameter Ø (mm)	Average Inside Diameter (mm)	Average Outside Diameter (mm)	Stiffness (KN/M)
1,400	1,402	Outside Diameter will vary according to the pipe Stiffness and core tube Selection.	Based on customers request
1,500	1,500		
1,600	1,600		
1,800	1,800		
2,000	2,000		
2,200	2,200		
2,400	2,400		

JOINTING TECHNIQUE

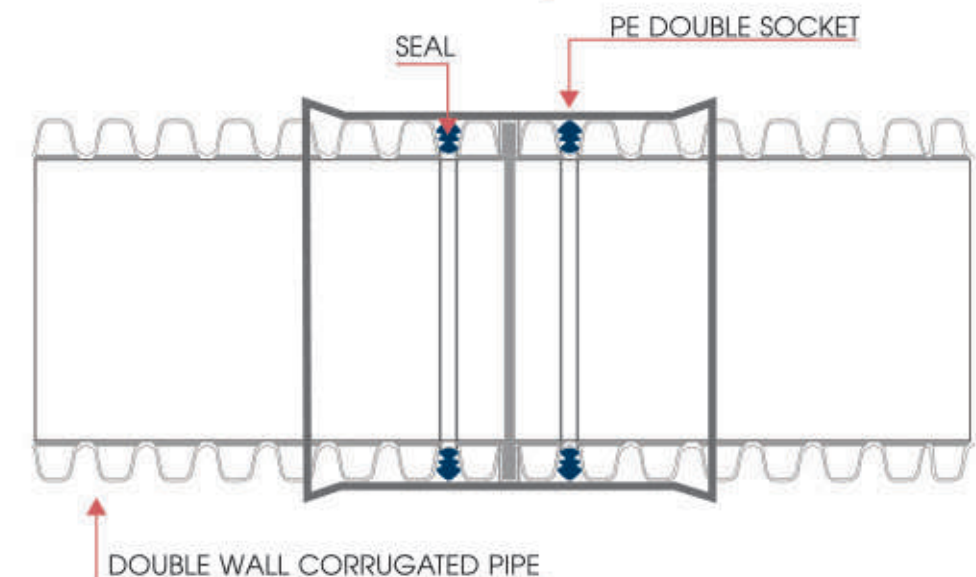
Type A- Corrugated Pipe Cuff Joint With Rubber Seal / Gasket



Type B- Spiral Pipe Cuff Joint With Rubber Seal / Gasket



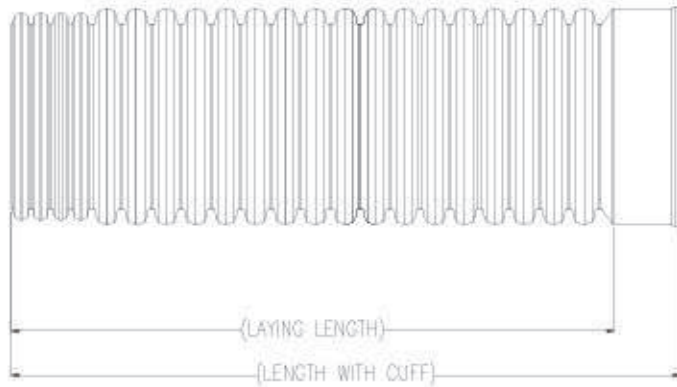
Double Socket Joint With Rubber Seals / Gasket



PIPE PROFILES



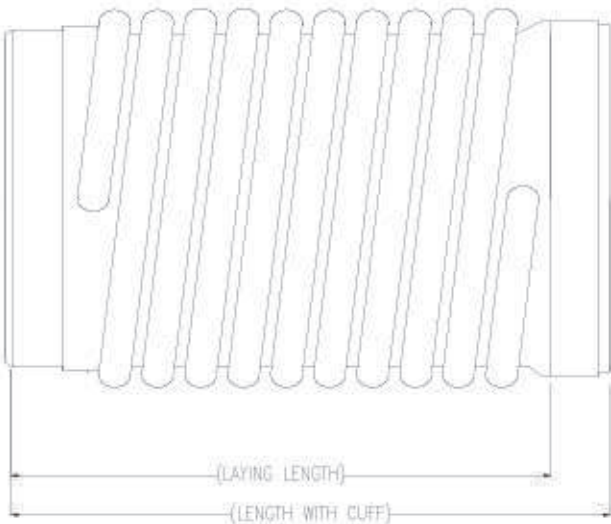
1) CORRUGATED PIPE PROFILE



As the figure on the left reveals, the pipe's body is comprised of curves, or corrugations, throughout. These corrugations are essential to the design of the pipe, and hence this type of pipe is globally recognized as a corrugated pipe. The ends of corrugated pipes are the essential component in the jointing process.

The end that looks similar to the body (and in some cases identical) is commonly referred to as the bell, or spigot. The end that has a chamber-like look is referred to as the cuff.

2) SPIRAL PIPE PROFILE



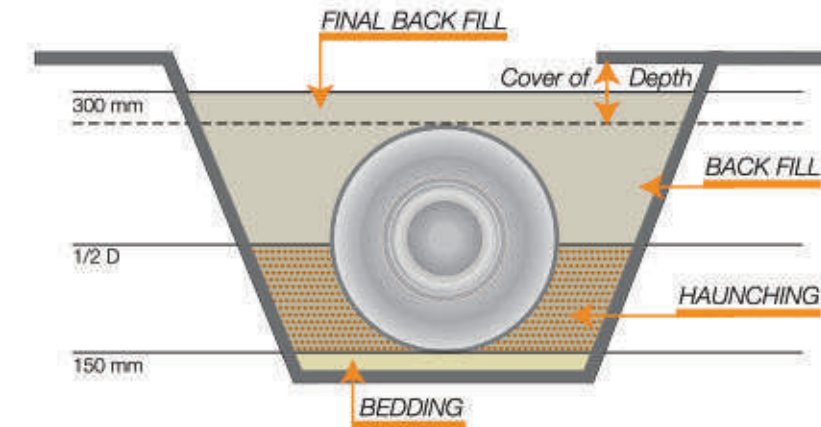
HDPE pipes of a relatively larger diameter ($\phi 1400\text{mm}$ - $\phi 2400\text{mm}$) are manufactured in a different way, and are hence commonly referred to as HDPE Spiral Pipes.

The pipe's characteristics however are identical



INSTALLATION DETAILS

TYPICAL TRENCH & TECHNICAL TERMS FOR INSTALLATION



KAI HDPE CORRUGATED DOUBLEWALL PIPES OFFER A DISTINCT WEIGHT ADVANTAGE COMPARED WITH OTHER PIPING PRODUCTS.

This leads to the following advantage:

- Requires less manpower and lighter machinery to transport, handle, and connect.

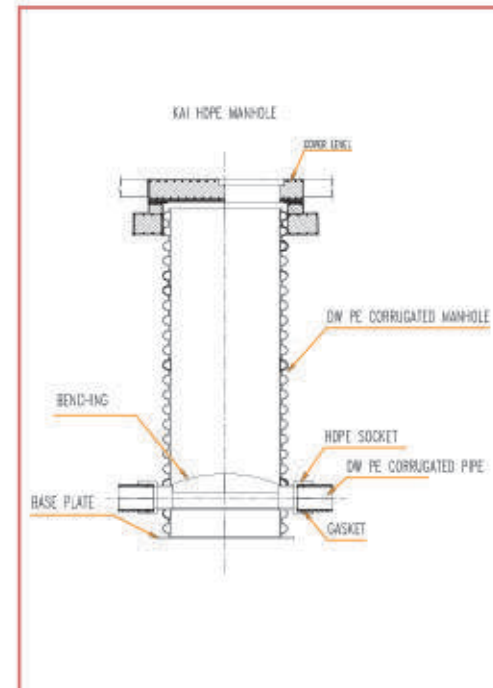
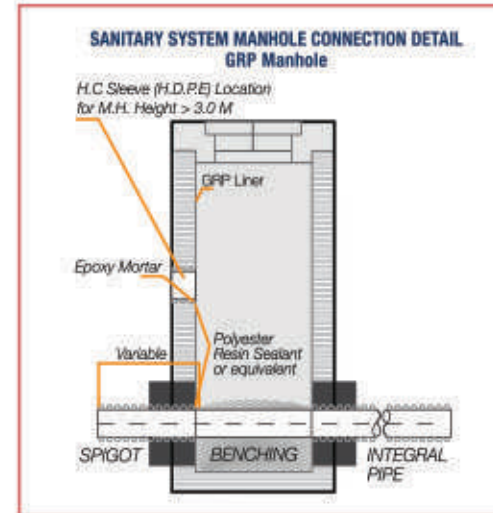
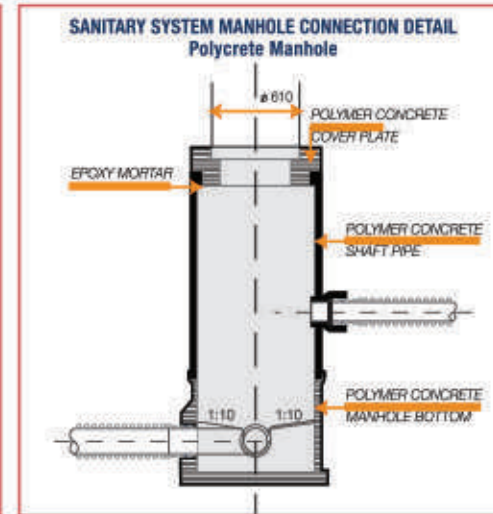
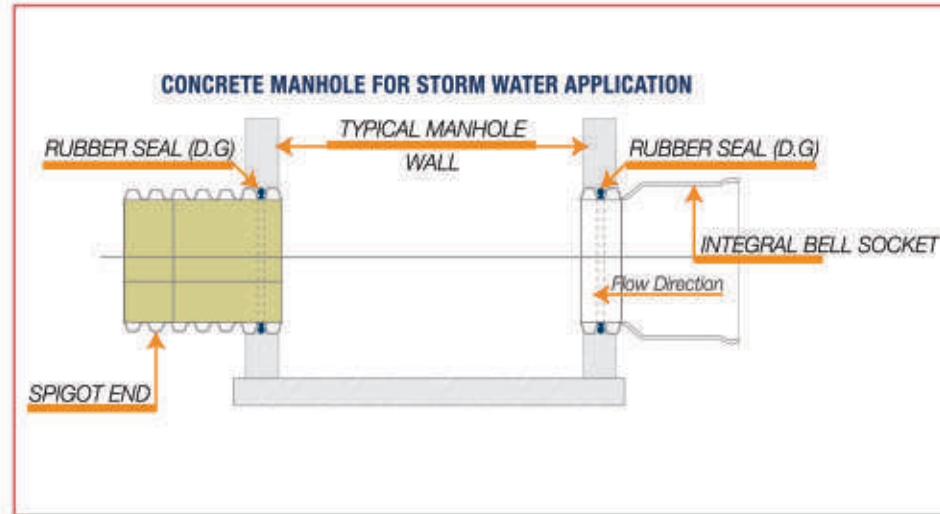
- Saves time because longer lengths of pipe can be laid up to three times faster than conventional pipes of the same diameter.
- Easier on-site cutting and trimming.

INSTALLATION PROCEDURE FOR HDPE CORRUGATED DOUBLEWALL PIPES

- The trench foundation should be smooth, stable, and free from roots, rocks, and other sharp objects.
- The height of the bedding should be 150mm and should consist of soil classifiable as ASTM D2321 Type II SP compacted to 90% DPr (Degree of Proctor).
- Haunching and back filling soil type is the same as used for bedding, soil should be placed to successive lift of 150 mm and compacted to 90% DPr.
- Height for final back fill: 300mm above the crown.



MANHOLE CONNECTIONS



MANHOLES AND CATCH BASINS PROVIDE:

- Points for changes in pipe, directions, & size
- Allow storm runoff to enter
- Provide for system access

The method used to join the pipe and the structure depends on the projects needs, type of pipe, and the style of the structure.

CONCRETE, POLYCRETE & GRP MANHOLES

The most common practice for KAI HDPE corrugated wall pipe is to fix the pipe into the concrete manhole of basin opening, with a mixture of concrete aggregate. The mixture should be pressed between the corrugated pipe and the manhole opening. This type of connection is soil tight, as a minimum, and is acceptable for the majority of storm sewers. Because of the corrugated exterior, this connection also creates a water-stop effect. For polycrrete and GRP manholes pipes are directly connected to a Polycrrete or GRP manhole. Rubber seals are mounted on the KAI HDPE corrugated wall pipe and pushed in the inlet/outlet of the manhole.

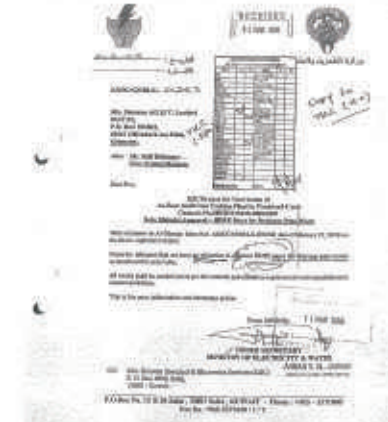
HDPE MANHOLES

As for HDPE manholes, KAI HDPE corrugated doublewall pipe is connected to the HDPE manhole using a rubber seal or butt welding / Extrusion welding to provide a leak proof joint.

APPROVALS



Ministry of Public Works



Ministry of Electricity and water



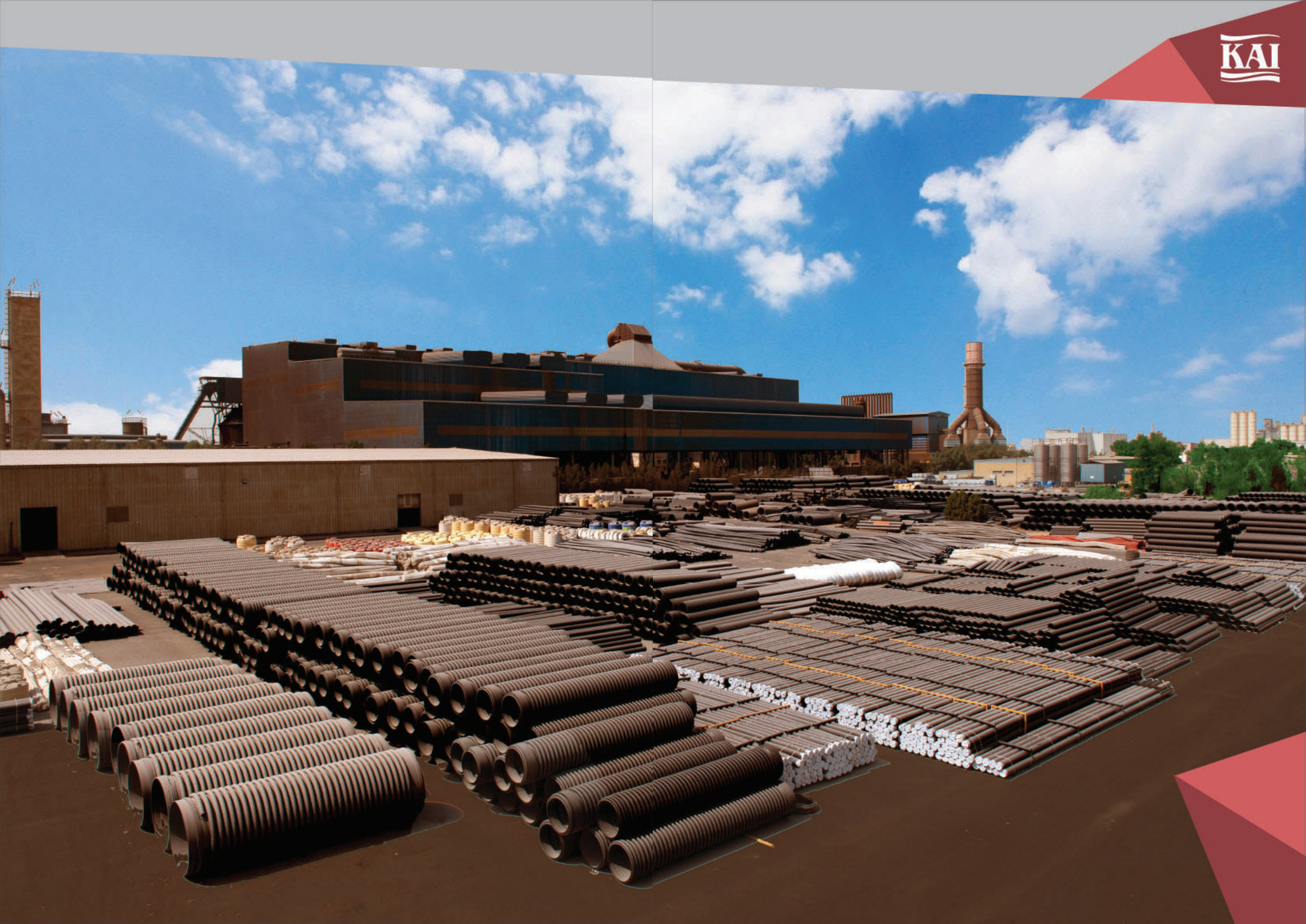
Public Authority of Industrial



Kuwait Oil Company



Public Authority for Housing Welfare



PACKING & LOGISTICS

Logistics

Our Logistics team handles the storage and the distribution of goods. They ensure that the right products are delivered to the right location on time and in excellent condition. Whether our products are being delivered via land, air, or sea, our experienced personnel will ensure the best possible conditions to exactly match our client's requirement.

Storage

Our Store Department is equipped with storage management software, that tracks the movement of goods to the supplier, the storage and packaging at the point of retail. Our experienced team ensures that goods are stored according to the high international standard.

Packing

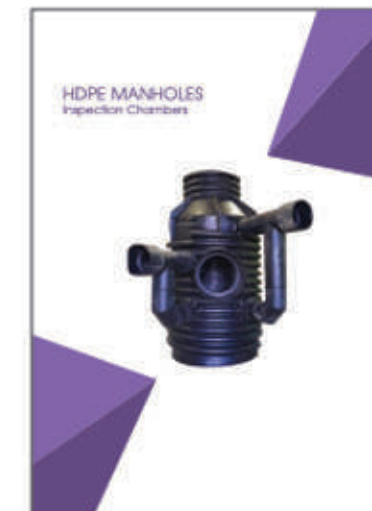
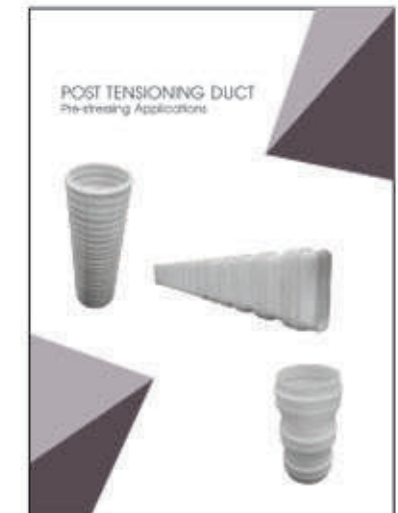
At Kai packaging department, we use well-designed packaging which plays an important role in delivering more sustainable products.

We choose packaging materials to ensure product sterility and protection, while minimizing excess package size, mass, volume and material. In addition, we are looking to ensure that packaging materials are responsibly sourced, and we are evaluating use of certified materials.

Customers must be completely satisfied and receive defect free services and products.

We demand and ensure that all products collected or delivered are in optimum condition for both operating & storing purposes.

OTHER VALUE PRODUCTS





kai.kw



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