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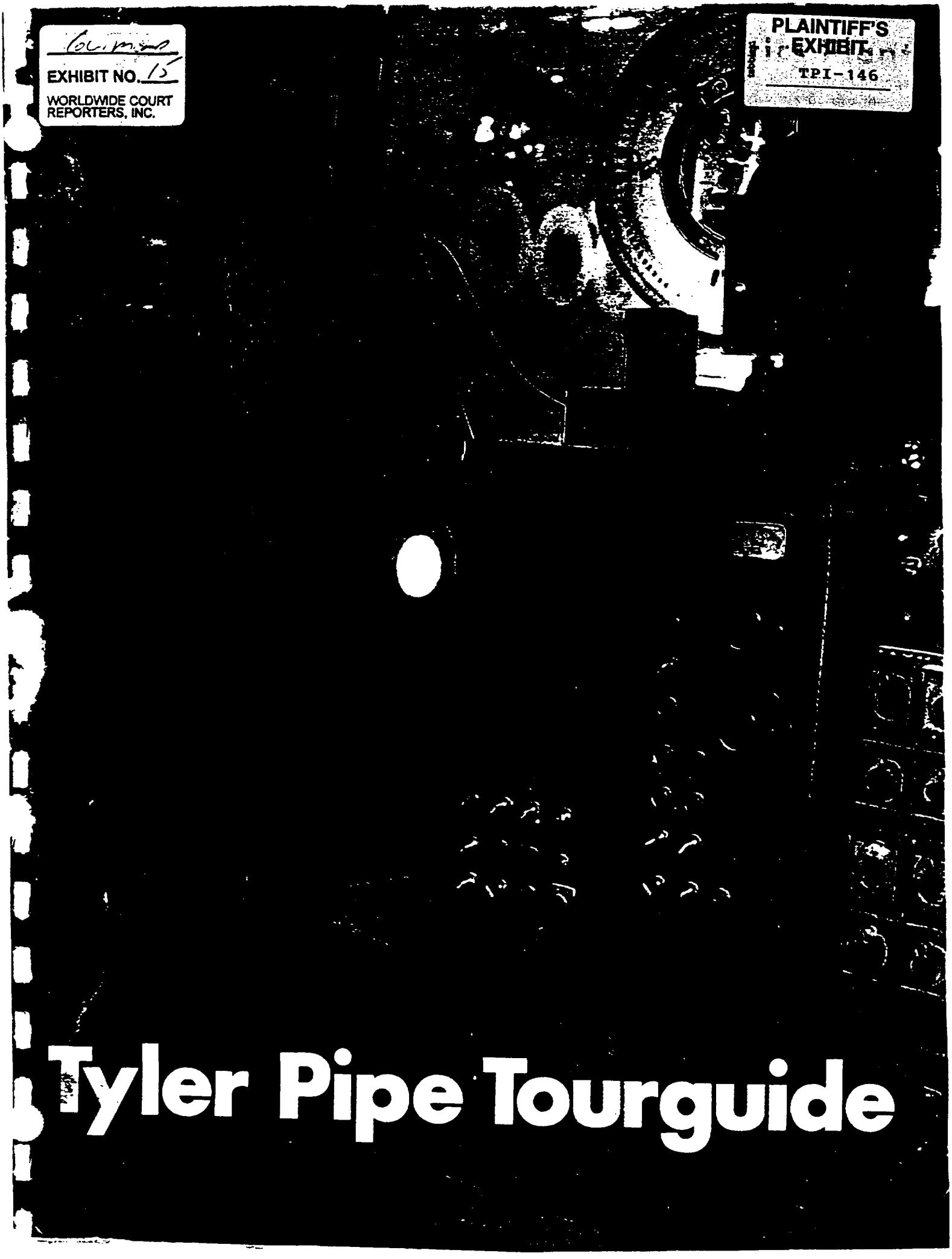
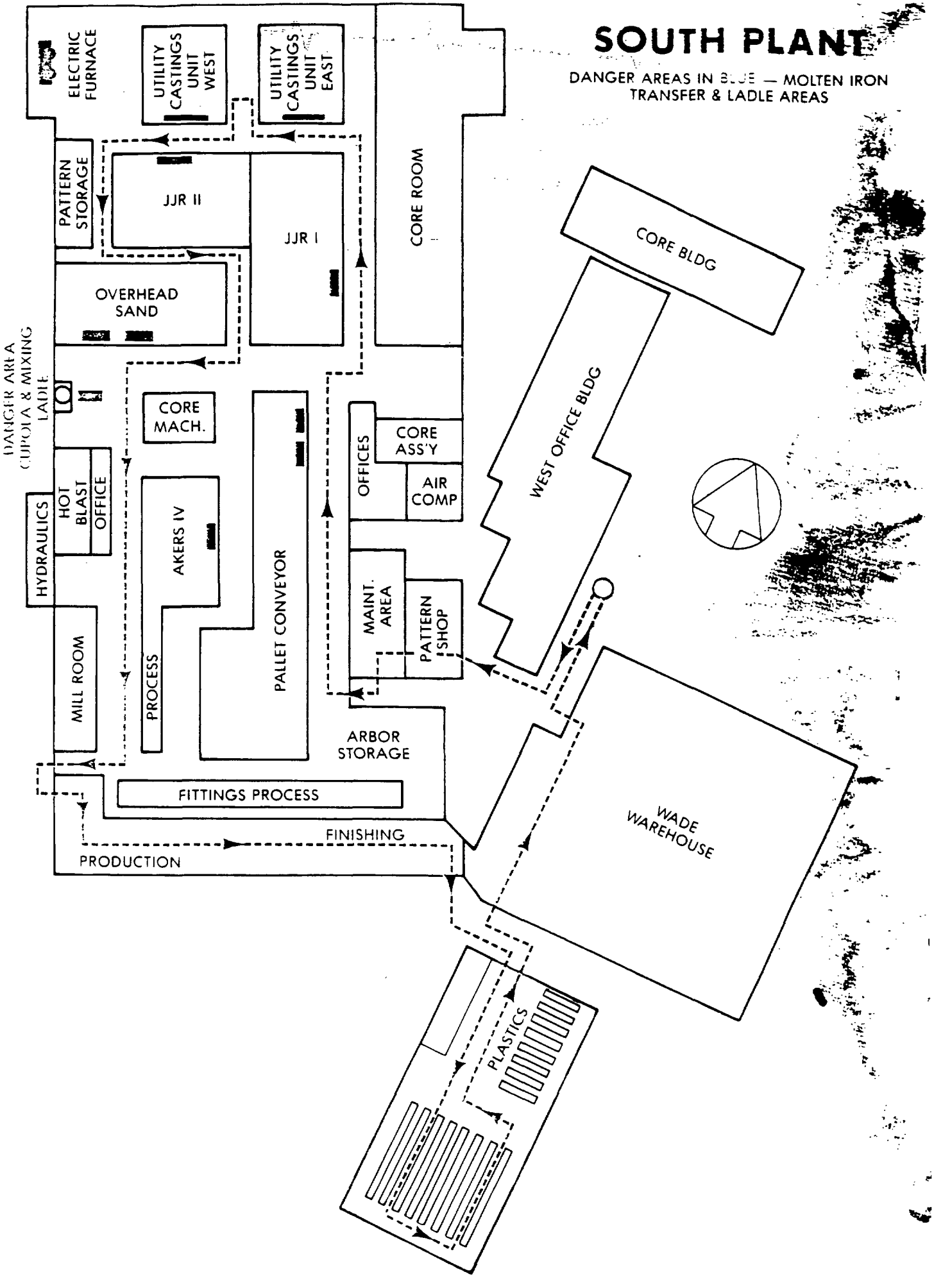


Tyler Pipe Tourguide


SOUTH PLANT
DANGER AREAS IN BLUE — MOLTEN IRON TRANSFER & LADLE AREAS
ELECTRIC FURNACE
UTILITY CASTINGS UNIT WEST
UTILITY CASTINGS UNIT EAST
CORE ROOM
PATTERN STORAGE
JJR II
JJR I
CORE BLDG
OVERHEAD SAND
DANGER AREA CUPOLA & MIXING LADLE
WEST OFFICE BLDG
CORE MACH.
OFFICES
CORE ASS'Y
AIR COMP
HOT BLAST
OFFICE
HYDRAULICS
AKERS IV
PALLET CONVEYOR
MAINT. AREA
PATTERN SHOP
MILL ROOM
PROCESS
ARBOR STORAGE
FITTINGS PROCESS
WADE WAREHOUSE
FINISHING
PRODUCTION
PLASTICS

Welcome!

This is a tour of Tyler Pipe in print. It may be used as a guide while actually walking through our facilities, or you may choose to review it at your leisure before or after a plant visit. Should you like extra copies, more are available. When visiting the foundry, be sure to observe the safety regulations, and use the safety equipment provided at all times!

The Company

Tyler Pipe is located seven miles North of Tyler, Texas. This is one of the largest cast iron soil pipe foundries in the United States. Tyler Pipe manufactures cast iron soil pipe and fittings, staple specials and drains, watermain fittings, utilities and municipal castings, specification drainage products and plastic pipe and fittings. More than 2,500 people work here.



Tyler Pipe production, sales and transportation departments cover more than 14 acres. Bottom: Transportation; Left, Hiway 69 and Utilities storage; Center, South Plant - Plastics plant, Product warehouses; (Tall white building is Moldmaster unit.) Top, North Plant; Right, Administration building and parking.

Pattern Shop

This story and our tour begins with the Pattern Shop. The accuracy of the pattern determines the quality of the castings, and Tyler Pipe's shop is second to none. The Pattern Shop is a blending of old world craftsmanship and modern technology. First, wood workers transform blueprints and drawings into wooden patterns. These patterns are hand-made, dimensionally accurate, full size replicas of the finished products. From wood, the patterns are duplicated in aluminum for permanent storage. Aluminum masters are used to make match-plates for production work. Pattern makers also work with epoxies and ceramics.

After learning about patterns, we will visit an area where more than 50,000 match-plates are stored ready for use.

Fittings Production

Cast iron soil fittings begin in the South Plant production area with the Herman "match-master". This automated machine duplicates all the functions of hand mold production. The machine uses electrical, hydraulic, pneumatic and mechanical power. It is a mass of wiring, tubing, remote control devices, flashing red and green lights and is a maze of activity. The machine produces hundreds of molds every day; each mold is exact in tolerances and dimensions.

Finished molds are placed on a moving railway which circles for 1/4 mile inside the plant. Down the line from the molding machine is the pouring station.

Iron Pouring

Here, highly skilled operators "climb aboard" the

train with ladles of molten iron. Riding on a separate moving roadway at the same speed as the molds, these operators fill each mold cavity with molten iron. At the fittings finishing station, we will catch up with these molds and follow the castings some more.

Watermain Fittings

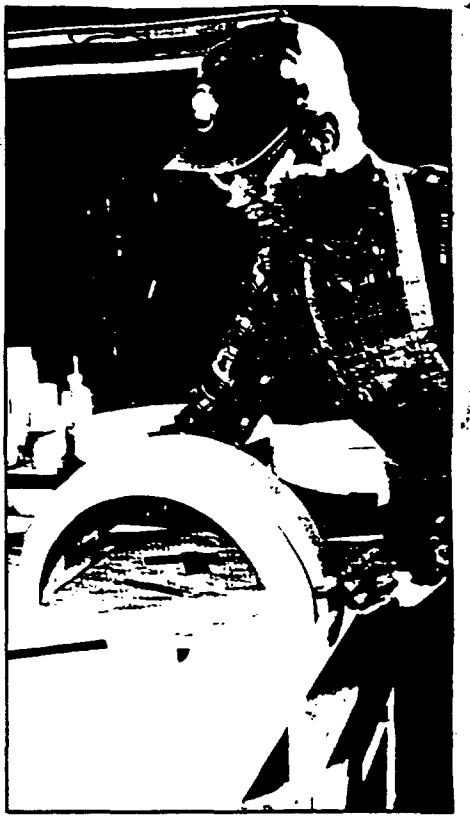
The JJR I and II areas use teams of skilled molders and very large, heavy and specialized machines to make big watermain fittings. Molding sand similar to that used in the Herman molds is dumped onto flasks containing massive cope and drag match-plate production patterns. Core insertion is meticulous; it requires a two ton electric lift and lots of nylon straps. When the JJR units are operating, the whole foundry knows. . . but JJR does not stand for jump, jar and rattle — it just seems to fit. (JJR is the manufacturer's model series.)

Core Room

Just across from the JJR units are several stations devoted to core production. Cores are used to make the waterway in the castings and the Tyler plant devotes more than two acres under roof for producing and storing cores for watermain fittings, specification drains and cast iron soil pipe and fittings.

Sand, resins, binders, infra-red heat and dedication are needed to keep Tyler Pipe in cores. In fact, this area provides one of the key ingredients for a successful foundry — and in the volume required to keep up with demand. We measure sales volume in tons or feet, but almost every individual casting requires a separate core. And each core makes only a single casting.

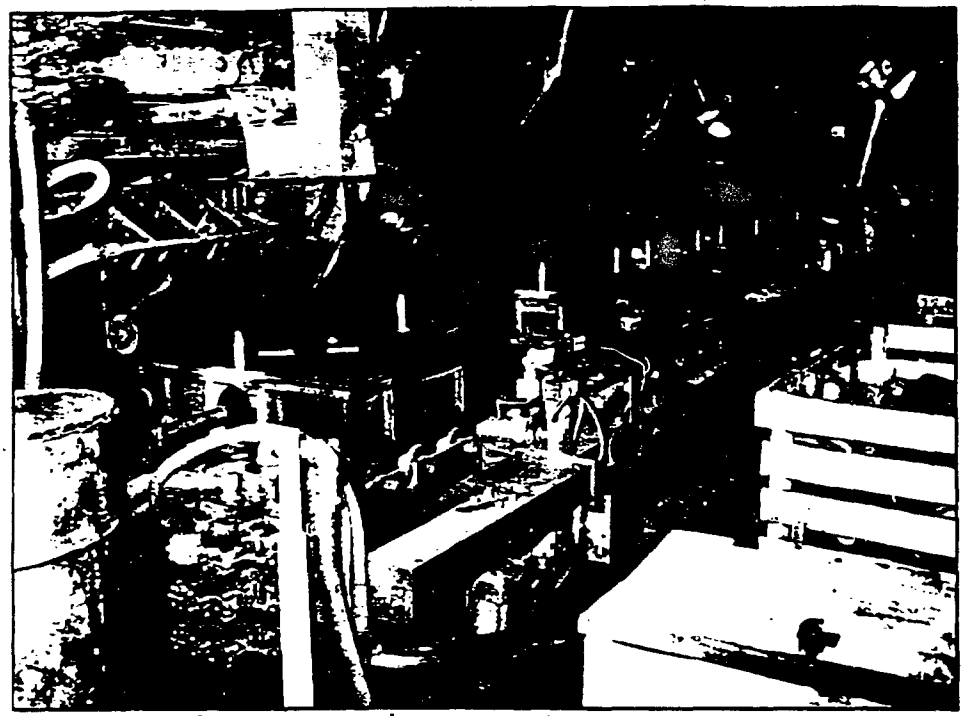




Two craftsmen at the Pattern Shop



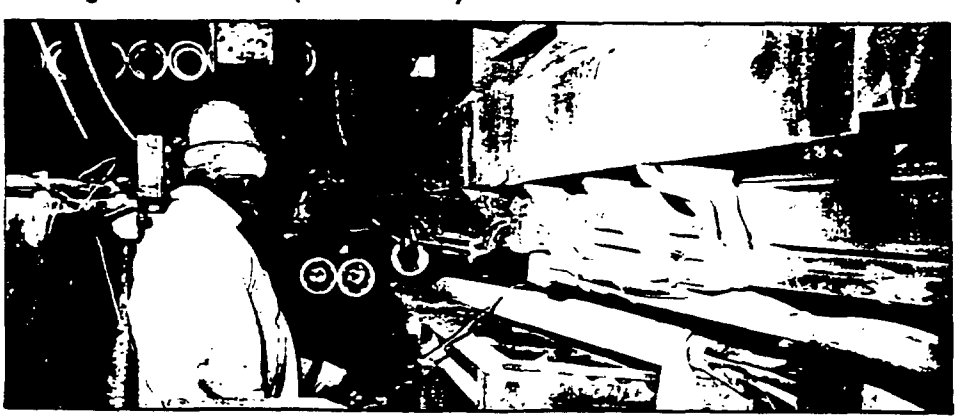
Herman match master molding station



Drag station of Herman match master unit



Pouring station of the pallet conveyor



Ten-foot pipe extracted from metal mold

You'll see claybonded resin shells, air set, oven baked, green sand with arbors and other types of cores. Your guide will explain the purpose and application of each variety.

Sand Handling

The overhead sand system at Tyler's South Plant is the most practical way to deliver great volumes of molding sand to multiple points of use. In the six-level main unit, a quantity of sand is mixed with proper binders. The moisture is measured and controlled during mulling and delivery sequences. The system of conveyor belts permit "instant" delivery of ready-to-mold sand at many different points within the plant.

Melting Area

In the South Plant cupola's refractory-lined holding ladle, there are 30 tons of 2800-2900° molten iron waiting for delivery to production stations. The heat inside is unbelievable and the entire area glows an orange-red. Though seemingly casual about automated equipment, heavy fork trucks and electric lifting devices, every man in the foundry has a deep and abiding respect for hot iron. In fact, this area is so obviously dangerous that it is quite safe.

Pipe Production

Near the cupola is a centrifugal pipe casting machine. This type machine was the first to make 10-foot soil pipe in the United States. By introducing a measured amount of molten iron into a spinning permanent metal mold, these units produce pipe of outstanding dimensional stability and strength. After the cherry-red pipe is pulled from the mold and placed on a conveyor unit, each piece is

inspected, then dipped. Additional inspection and packaging operations are at the end of the production line.

Fittings Finishing

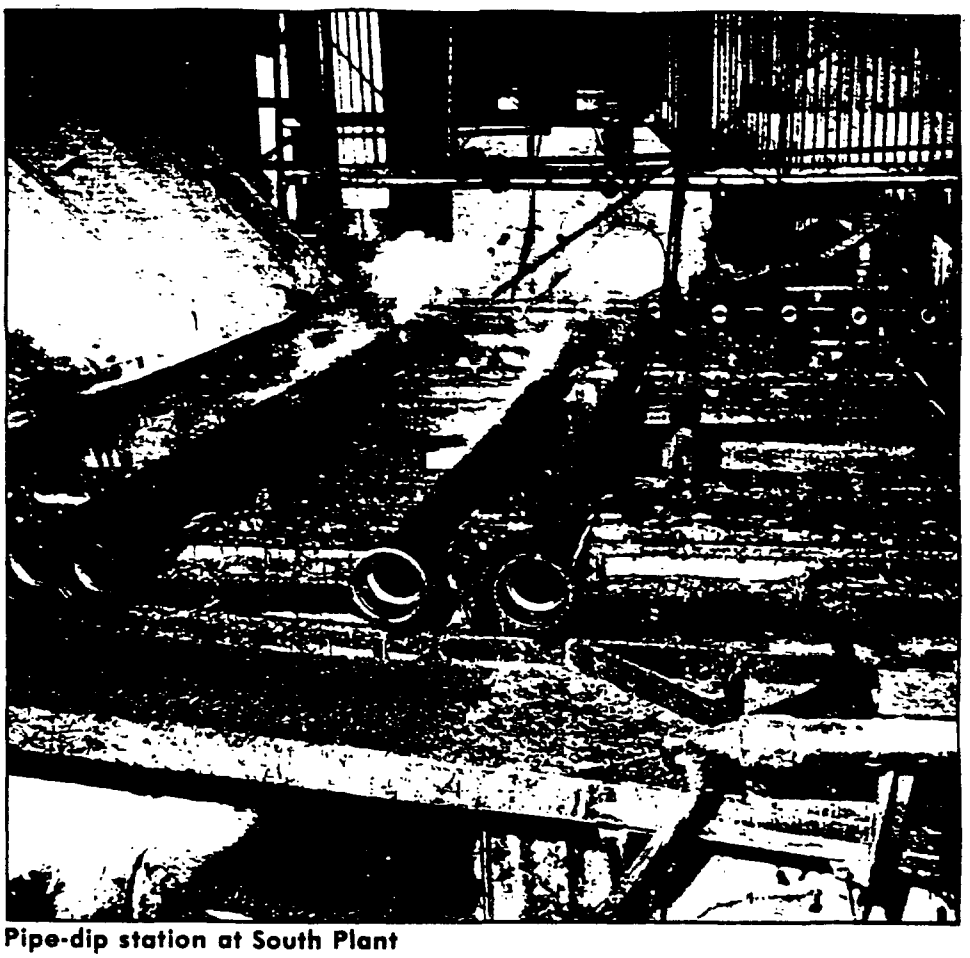
South of the pipe production area are fittings shake-out stations, the end of the line for soil fittings on the railway track. At this station, freshly-made soil fittings are separated from the sand. The hot castings are inspected and placed on an overhead conveyor belt.

You'll see the swinging line of fittings go overhead and into a large tank-like structure called a shotblast. Inside this unit, castings are bombarded by steel shot and cleaned of all sand and particles. They emerge a glistening silver gray. At the nearby fittings finishing station the new soil fittings are again inspected and workers with power grinders prepare each fitting for its final treatment, a dip in asphalt. Back on the overhead conveyor the fittings are then dipped in a tank. They emerge shining, familiar black. The complex of overhead conveyors then parades the fittings high overhead and outside the production area where they drop down for a last check and separation into storage bins.

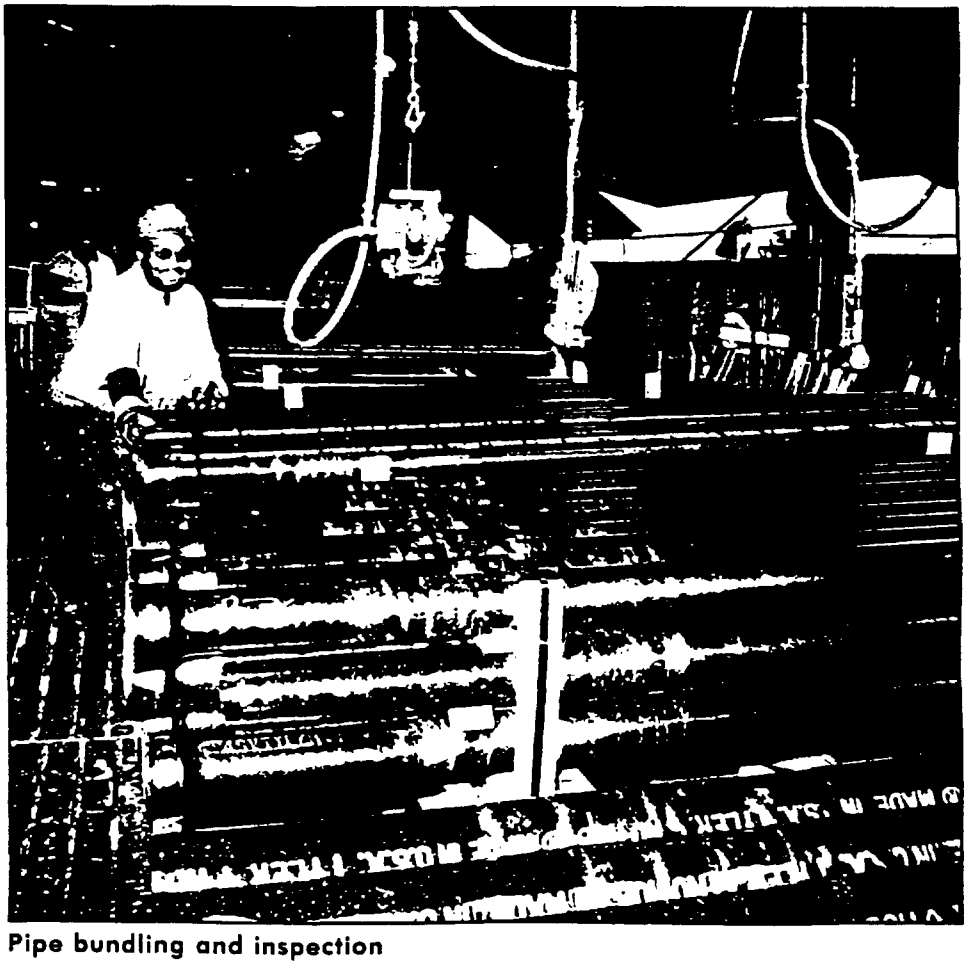
Production Finishing Areas

Many Tyler products require extra preparation; in these areas are our tapping, facing, and drilling operations for watermain fittings, specification drains and some soil fittings.

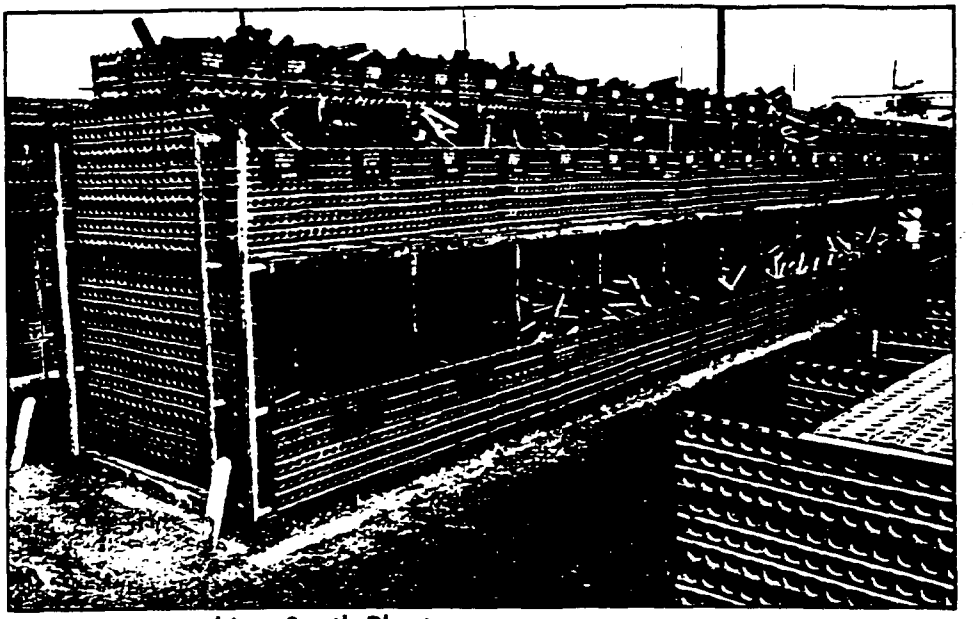
Much of the equipment has been built or modified by Tyler engineers to increase efficiency.



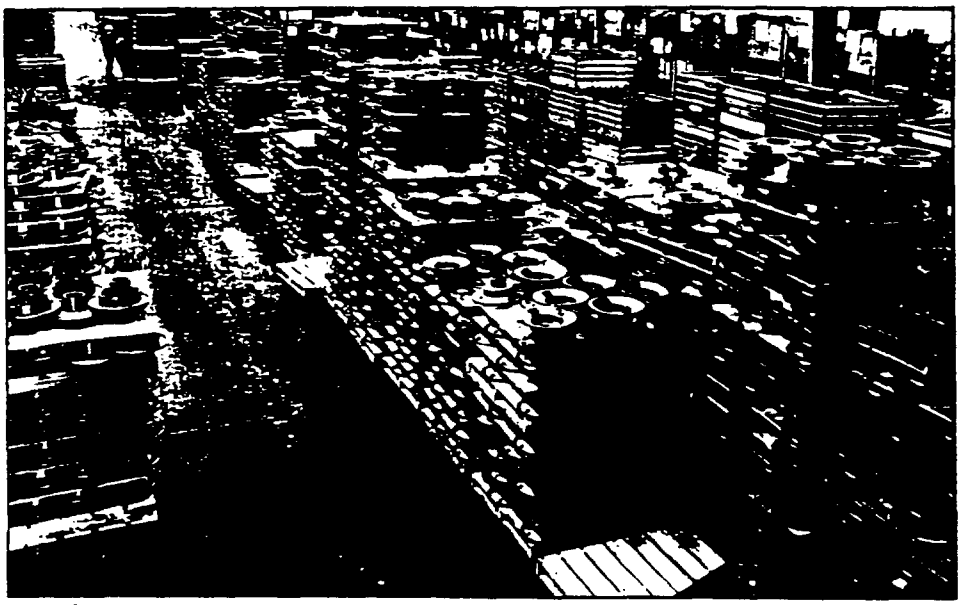
Pipe-dip station at South Plant



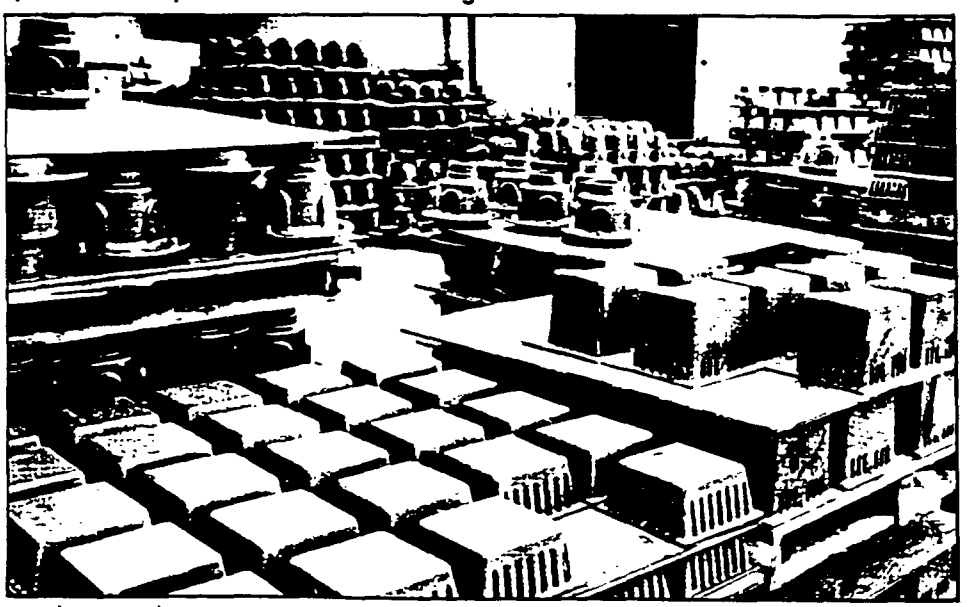
Pipe bundling and inspection



Fittings storage bins, South Plant



Specification products outside storage



Wade warehouse

Plastics Plant

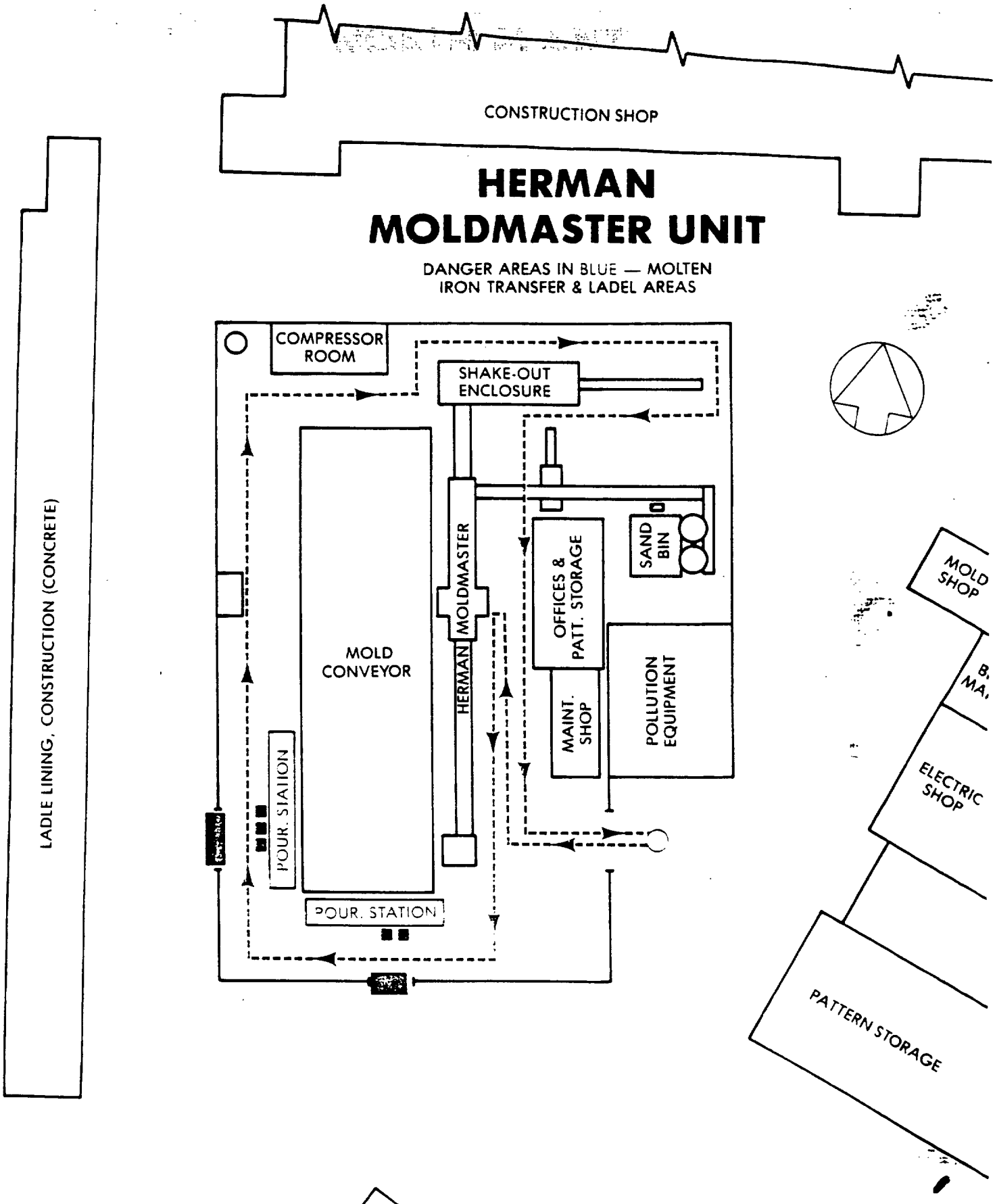
Plastics production buildings are a short walk across the storage yard. The contrast between plastic production and the cast iron foundry is considerable; you'll see long rows of highly automated machines produce PVC plastic pipe and fittings for drainage, waste and vent, and pressure applications. Much less noise, apparent activity and people seem to be required. From conveyors, the nodules of raw plastic are automatically measured and delivered to injection mold machines, which quietly manufacture the hundreds of different fittings required.

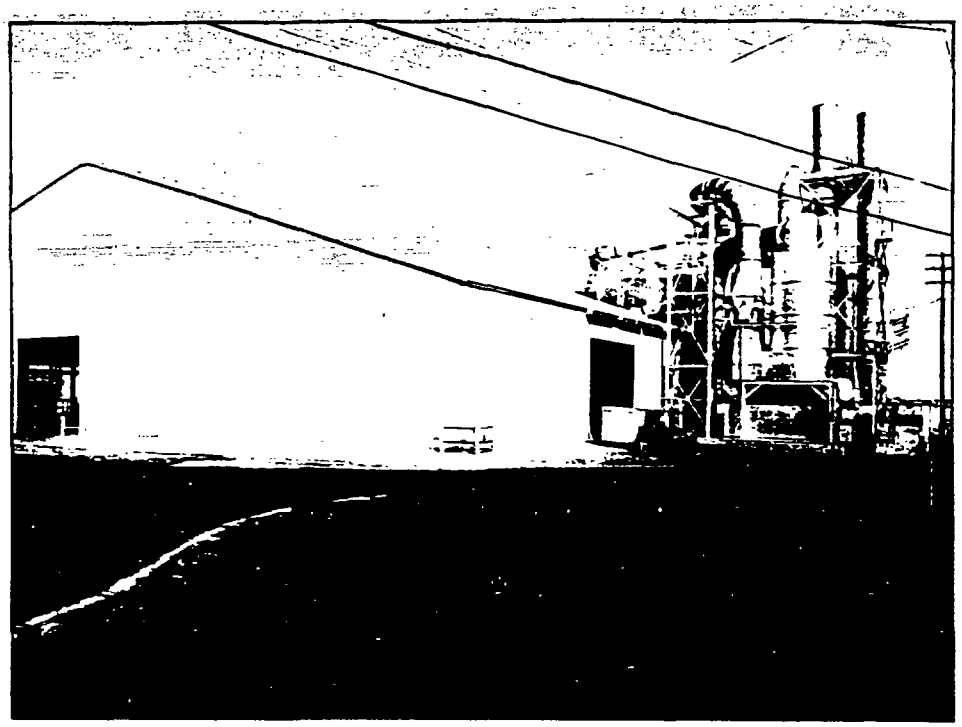
Finished fittings drop onto a moving belt for inspection, cleaning if required, and packaging. Injection mold machines use electric, hydraulic, air and mechanical power to perform their functions.

From the plastics fittings packaging area, we move to the production lines where plastic pipe is made in a continuous operation. Pipe from 1/2" to 10" diameter may be produced simultaneously and we may see one length of pipe 220-feet long. It's chopped off in 10 or 20-foot lengths by remote control, as required.

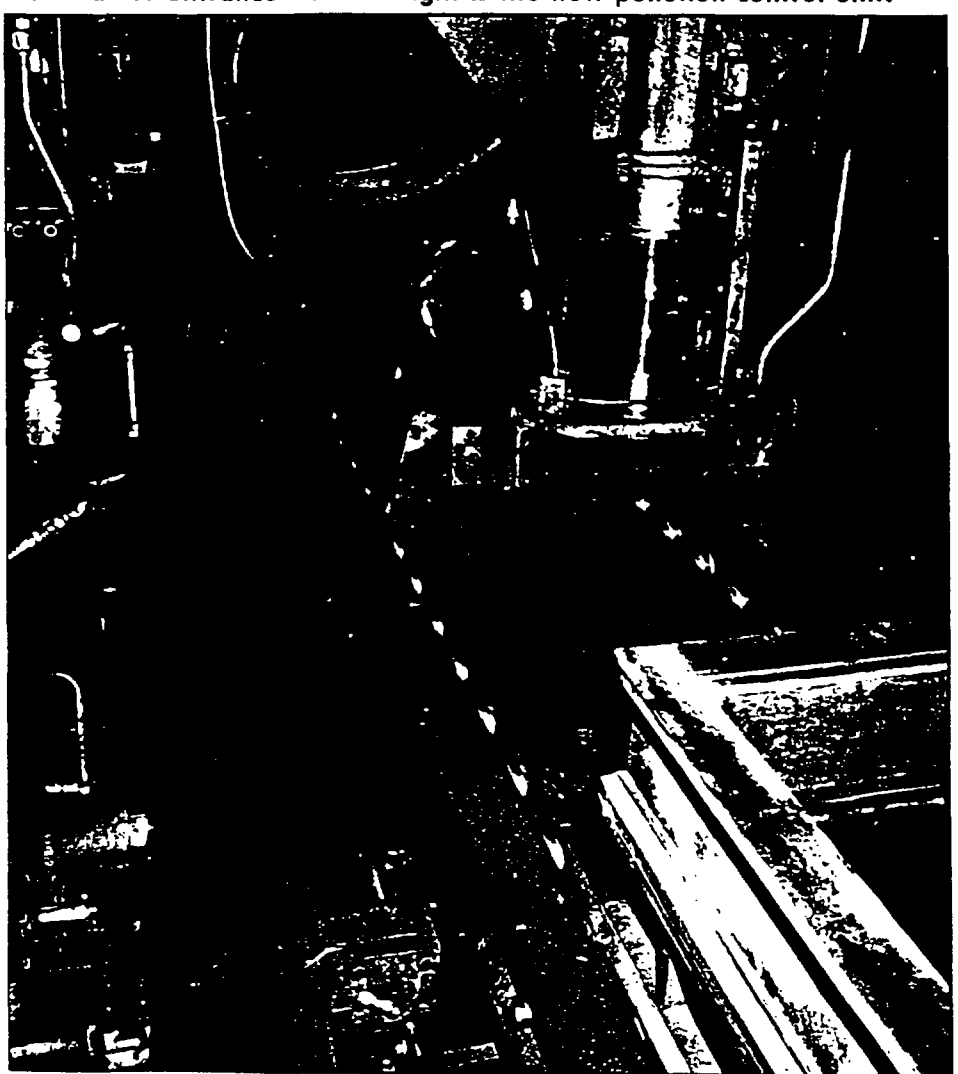
Warehousing

On the way back to the front office, we pass through series of integrated warehouses where 50,000 square feet is devoted to Wade specification products; 40,000 square feet of PVC plastic fittings, and nearly 20,000 square feet of TY-SEAL gaskets and No-Hub couplings. In the building are about 100,000 Wade drains, more than a million TY-SEAL gaskets, and more than two and a half million plastic fittings.


CONSTRUCTION SHOP
HERMAN
MOLDMASTER UNIT
DANGER AREAS IN BLUE — MOLTEN
IRON TRANSFER & LADEL AREAS
LADLE LINING, CONSTRUCTION (CONCRETE)
COMPRESSOR ROOM
SHAKE-OUT ENCLOSURE
MOLD CONVEYOR
HERMAN MOLDMASTER
OFFICES & PATT. STORAGE
SAND BIN
MAINT. SHOP
POLLUTION EQUIPMENT
POUR. STATION
POUR. STATION
MOLD SHOP
ELECTRIC SHOP
PATTERN STORAGE
SOUTH PLANT



Moldmaster entrance - on the right is the new pollution control unit.



Flask-Grabber — as a new flask approaches the casting station, this device (center) senses exactly where to stop the flask, then decides when to introduce sand into the flask.

Tyler's Most Modern Machine

The Tyler moldmaster represents state-of-the art technology in modern foundry practices. With tape-drive controls of electrical, hydraulic, pneumatic and mechanical power systems, the unit has already contributed to increased overall efficiency in producing large quantities of complicated castings — very quickly.

Completed in March, 1981, the unit is for practical purposes another foundry — less iron-melting sources. Were it to stand alone, the unit by itself would be larger in production capacity than several of our competitors. Combined with TYLER production, handling all delivery components, this unit positions Tyler Pipe as the industry leader.

The entire facility was designed and constructed by Tyler Pipe and the Herman Corporation. Tyler Pipe fabricated many of the ancillary facilities as well, including pollution control duct work, sand system and iron pouring stations.

The Building

The Moldmaster unit is located between South and North Plant production areas. Iron service is from the existing cupolas. As we approach the monumental structure (80 x 140' long, 114' tall), a dominating pollution control equipment tower is just to the right of the East entrance.

Cores, Controls

Inside the entrance is core-storage. Resin-shell cores are delivered day and night when

the Moldmaster is operating. Daily production requirements determine which cores are used, the stacks you see may be for either shift.

A CRT monitor reports machine function and production conditions to the single operator at the molding stand. He can over-ride the remote controls with a hand-held unit.

The Moldmaster produces sand molds for multiple casting of products for four product divisions. By mulling and re-using casting sand, this becomes, in effect, a closed system.

Molding Station

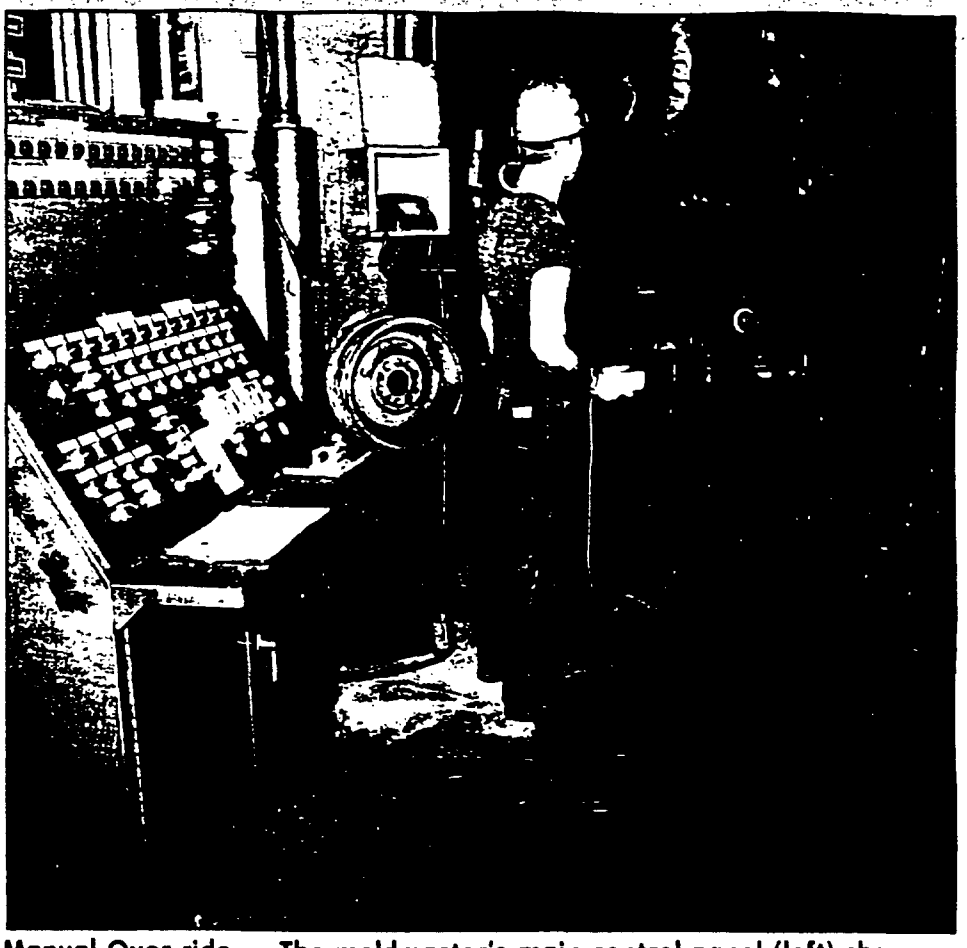
After molding is introduced to both the lower cavities (drag); and the upper cavities (cope) at the same time, hydraulic-pumped "fingers" press both parts of the mold simultaneously. Each part of the pattern makes a part of the casting — the core, added later, makes the waterway. Cope and drag start up the production line, positioned and controlled by remote equipment.

Core Insert

At this station, highly trained and conscientious foundrymen carefully position each core in the exact position, sometimes reinforcing an area subject to extreme heat distortion. The molds are checked for precision, cleanliness and firmness.

Mold Closing Station

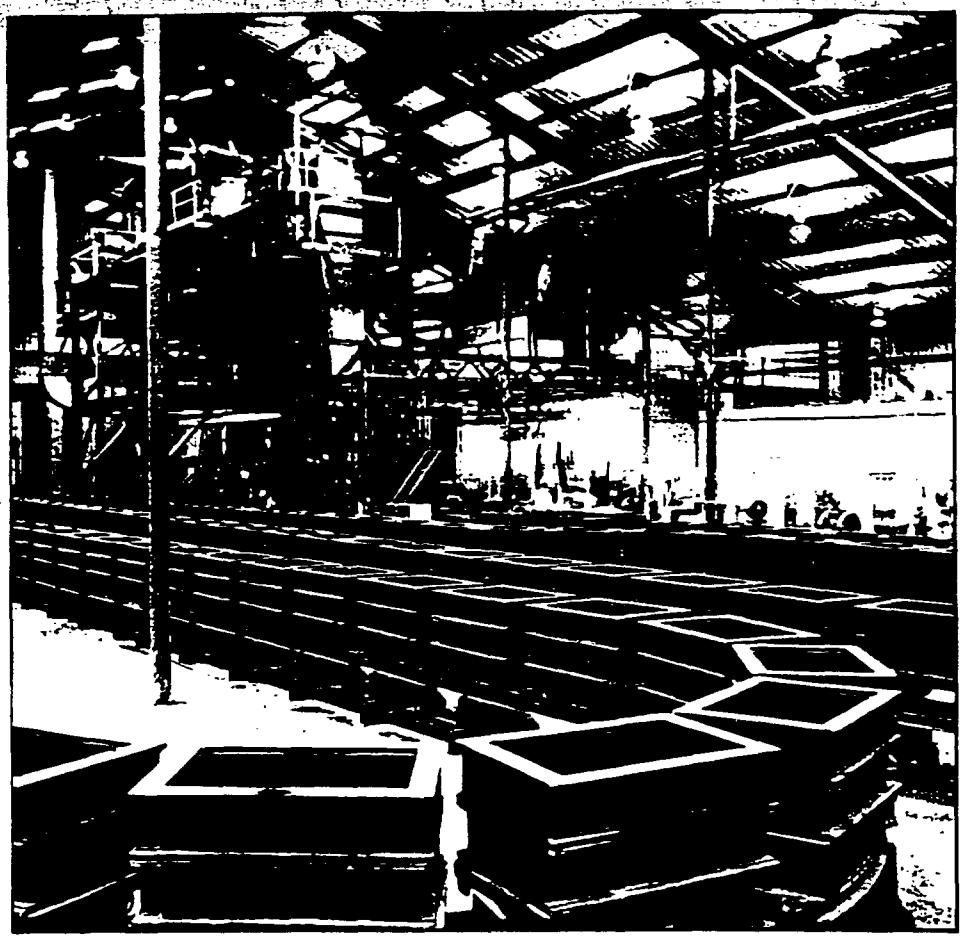
At this station, three very important steps are accomplished mechanically. First, the top section (cope) is lifted off the production line. Next, the matching bottom section is precisely positioned



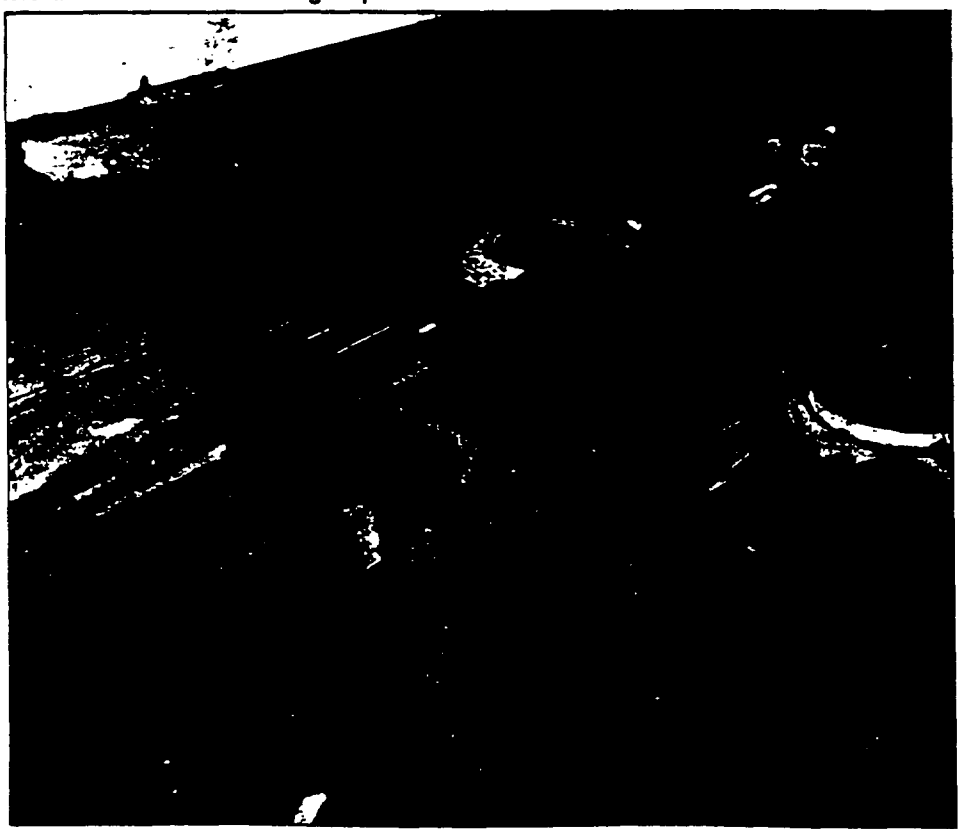
Manual Over-ride — The moldmaster's main control panel (left) shows machine functions. With a hand-held unit, the human molder can supervise the mechanized molder.



Pouring stations, moldmaster unit



Mold train makes a long trip



Moldmaster Shakeout — the whitish castings in the background are really fresh cast iron. The castings and molding sand pass over several grates before the castings are finished and the sand returned to its separate system.

beneath it. Then the cope is lowered and locked into position, ready for casting. In practice these three steps require less time than it takes to read this paragraph.

Finished fitting molds are transferred to the pouring train, which is an endless railroad moving in exact timing with the rest of the equipment.

Pouring Areas

At the pouring stations, white-hot iron is introduced to the fitting molds. Skilled iron pourers manipulate 500-lb ladles of iron while moving at the same speed as the mold. As many as eight ladles are in operation at one time. Molten iron is delivered as required from existing cupolas.

You will see two types of ladles handling molten iron at this unit. A special ladle mounted on an oversized fork lift is used to deliver iron from the cupola. Usually the ladle-unit itself is driven onto a stand and hooked up to a remote-control. This is one of several holding ladles, distinguished by size and heating apparatus from the smaller, more mobile pouring ladles.

Note that the iron-handler is well-protected in this, the most hazardous environment of the foundry. He wears extra flame retardant foot protection, leggings, a heavy apron to deflect molten iron, and insulated work gloves. Hearing, breathing, vision and head protection is also required. Skill and a healthy respect for hot iron are prerequisites for these positions — but most iron pourers would have no other job in the foundry, for this challenging, creative, dangerous vocation is the end of the beginning of every casting. And the job requires a

great deal of skill and talent to perform well and economically.

Cooling Area

After pouring, the mold with its fresh casting inside is "taken for a ride" to allow the metal to solidify and adjust to its new state. More than 1200 feet of rail in a serpentine design is required. The mold may take 45 minutes to proceed to the next station.

Shake-Out, Fitting Separation, Sand Reclamation and Casting Cleanup

In the shake-out area, the sand mold and core are literally separated from the hot iron casting — by vibration and jolting movement. The sand is seived and recycled in the high-speed muller, where clay and other additives are blended to make good molding sand.

Meanwhile, the casting is inspected, cleaned, (burrs, fins & gates removed) separated by size and type and boxed for dipping.



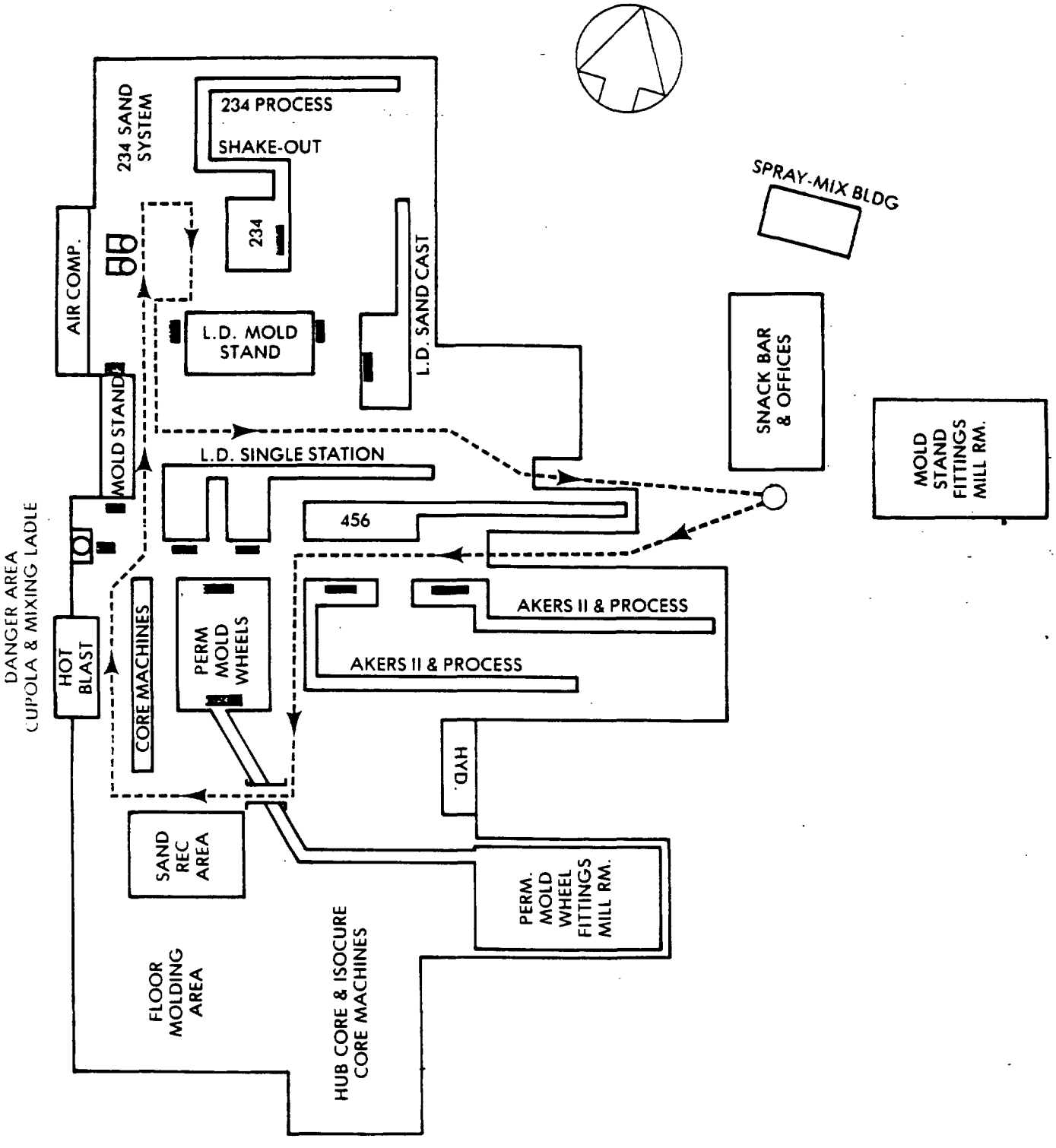
Moldmaster electrical control panel — in an air-conditioned balcony next to the lab, this series of switches, breakers and coils is a part of operation, too. Two electricians check a fuse and trace a line.



From coke through limestone to cast iron . . . this multi-exposure is an image of the many materials and processes involved in melting iron.

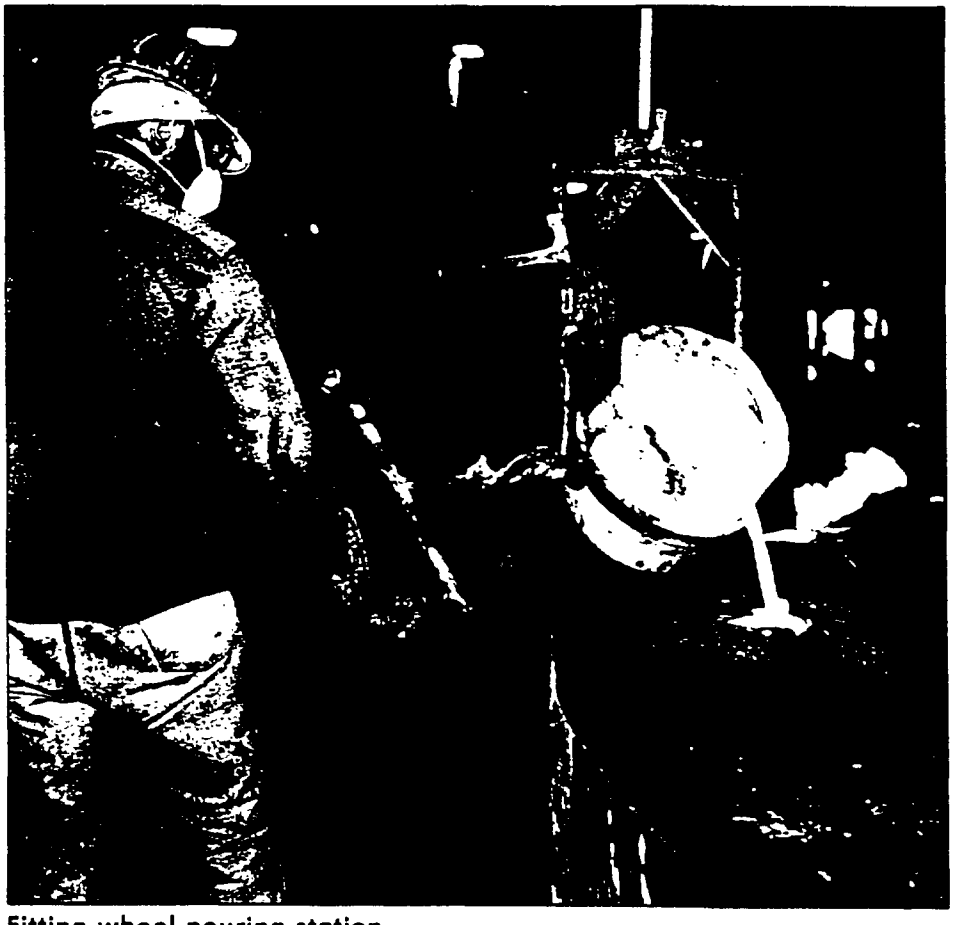
NORTH PLANT

DANGER AREAS IN BLUE — MOLTEN IRON
TRANSFER & LADLE AREAS





North Plant cupola holding ladle



Fitting wheel pouring station

North Plant Tour

The North Plant production area is a separate foundry, completely mechanized, and geared to high volume production of common items. There are rows of centrifugal casting machines spinning soil pipe from 2" thru 4" diameter. Across the line are single station machines to make larger diameter soil pipe, and complex machines which produce double hub soil pipe.

Melting Area

Anyone entering the North Plant production area is immediately aware of the huge cupola which dominates the North Plant production facility. This 108" cupola is among the industries largest. It can produce more than 50 tons of iron per hour. Both Tyler Pipe cupolas are continuously operated, water-cooled units which are "super-charged" with preheated air induction systems. Like most of the equipment at Tyler Pipe, the units are controlled and their functions measured by remote instrumentation.

Permanent Mold Fitting Wheels

In a separate area adjacent to more core machines, the fitting wheels or "merry-go-rounds" use permanent metal molds to make common soil fittings. Permanent mold casting eliminates the complex sand molds by producing fittings in re-useable, two-piece, water cooled molds. Fitting wheels have several molds mounted in a circle, each producing a different casting. As the machine rotates (much like a merry-go-round) the required production steps are performed, some

automatically, at the various work stations.

Fitting Clean-Up

The castings drop from the fitting wheels onto a conveyor which delivers them to inspection, grinding and cleaning, dipping and storage units.

These operations are similar to what you have seen at the South Plant, but on a much larger scale.

Floor Molding

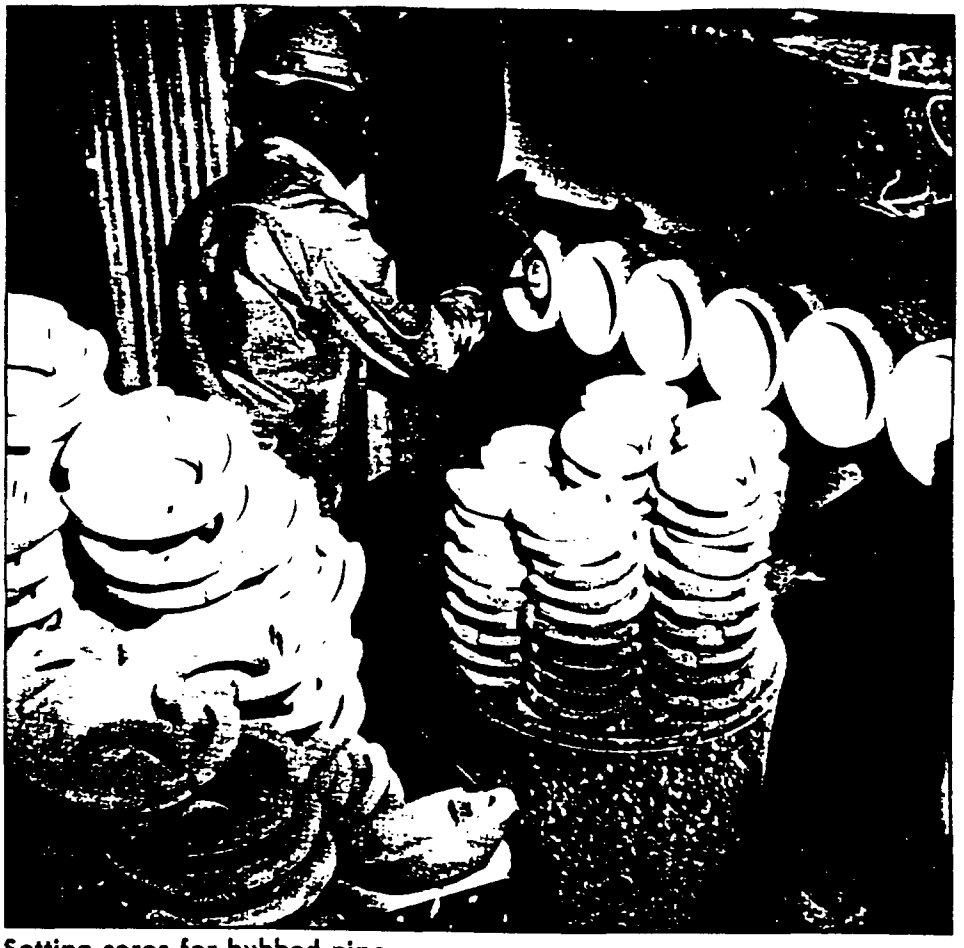
A tiny portion of the North Plant is devoted to old time production methods, such as the "running floor" operation. Now used only for some municipal castings, the running floor is like looking into the past, because castings are still made here just the way all cast iron was produced in years past.

If you have a chance, check out the wooden equipment and old time methods used to make these particular castings.

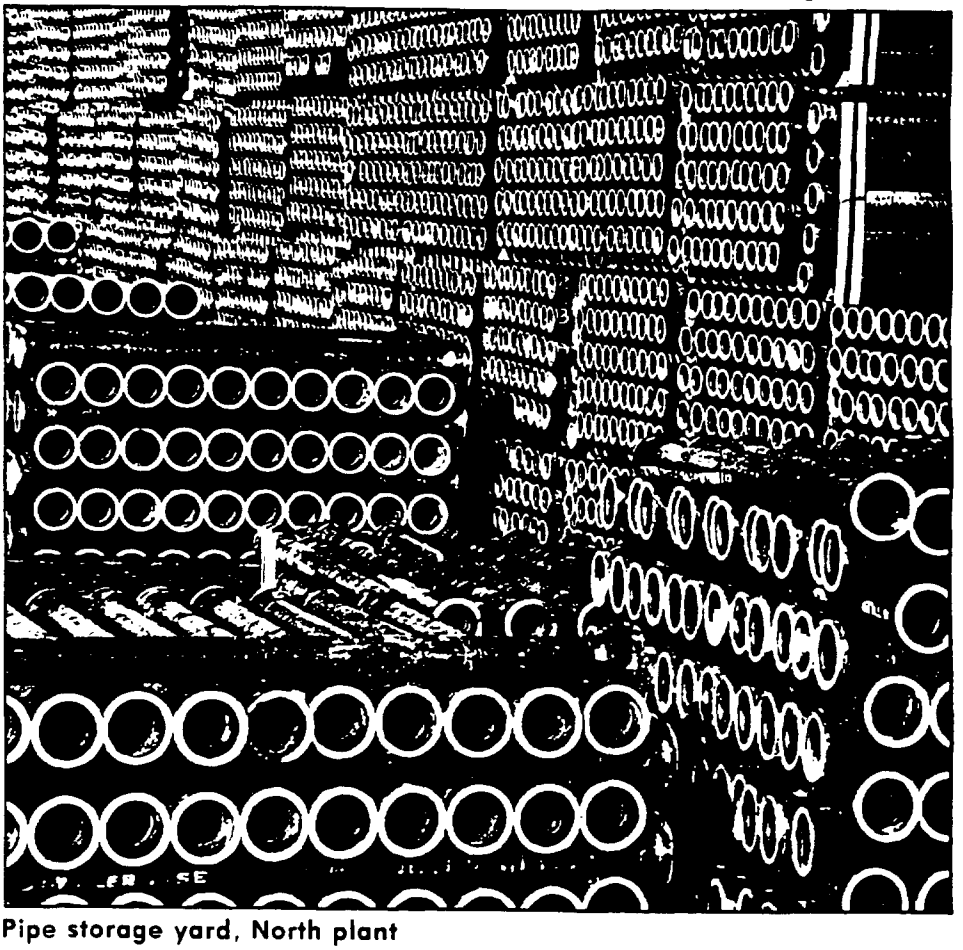
With the modern equipment at Tyler Pipe, we now make a whole truck load of soil pipe in the time it used to take two men to prepare and pour a single casting.

Permanent Mold Fitting Stands

The two areas of stationary permanent molds are a second generation development. This is an adoption of permanent mold technology which produces larger, heavier bodied castings for two sales divisions. And you'll see some solutions to foundry handling problems (what would **you** do with a 400 lb. red hot hunk of cast iron?)



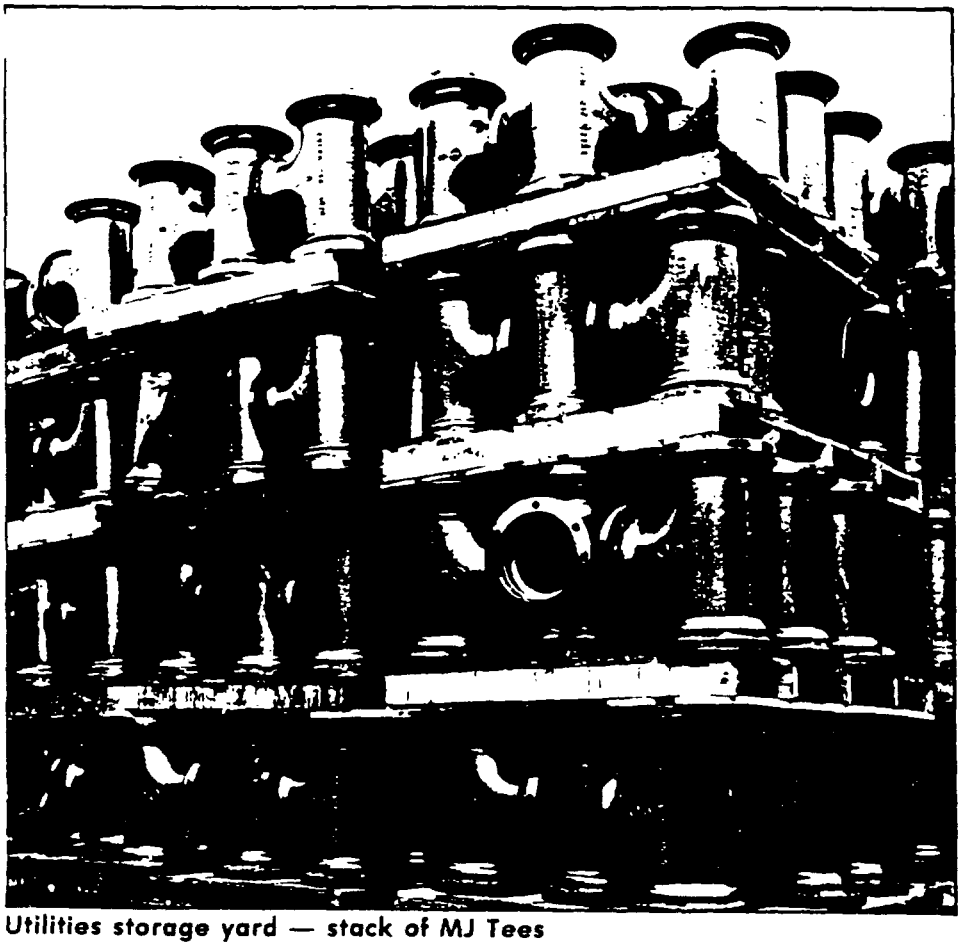
Setting cores for hubbed pipe



Pipe storage yard, North plant



Fittings storage area, North Plant



Utilities storage yard — stack of MJ Tees

Double-Hub Pipe Machines

Continuing the survey of large equipment, next is the sand-lined pipe casting machines. While the principle of centrifugal casting is similar to other units, those machines require new sand molds for each piece of pipe...with hubs cast on **both** ends, the sand mold is destroyed after each cycle. Tyler Pipe is the only cast iron foundry producing large-diameter double hub pipe.

Storage Areas

Our tour ends with a trip through the North Plant storage yard. This is a 10-acre paved lot filled with soil pipe of all diameters and lengths, some utilities castings, and specialty flanged fabricated piping. We may drive by the thousands and thousands of stacked soil fittings as well, to see the new shipping facilities where 16 trucks can be loaded mechanically at the same time.

Did You Like It?

We hope your visit to Tyler Pipe leaves you impressed with the skill and energy of our employees and aware of the engineering and precision casting skills that make today's cast iron products for commercial construction.

Chronology

1935 - Company is founded in Tyler, Texas as the TYLER IRON AND FOUNDRY COMPANY.

1937 - M. J. Harvey named President. Production of cast iron soil pipe and fittings begins.

1943 - Plumbing products restricted; foundry manufacturers ordnance for war effort.

1945 - Name becomes Tyler Pipe & Foundry Company.

1946 - New department markets staple specials, staple drains and municipal castings.

1948 - Additional production facilities open seven-miles north of Tyler at Swan, TX.

1952 - Utilities fittings and specification products add to lines.

1957 - Plants and offices moved to Swan. Tyler Pipe product catalog introduced. Company exhibits at first national trade show.

1958 - Centrifugal pipe casting machines developed. Tyler introduces industry's first 10-foot lengths of cast iron soil pipe.

1959 - Turn-table process using metal molds for fittings put into operation. Company achieves national distribution.

1960 - Computer system for sales and inventory control adopted and applied.

1961 - TY-SEAL® compression gasket introduced to the industry.

1963 - Tyler Pipe purchases Wade, Inc.; markets full line of plumbing and drainage specification products. TY-SEAL gaskets receive national acceptance.

1964 - Tyler No-Hub pipe and fittings production begins. East Penn Foundry Company at Macungie, Pennsylvania purchased.

1965 - John Warner named President.

1966 - TY-SEAL gasket sales exceed 10-million units.

1967 - Name changed to Tyler Pipe Industries. Cast iron pressure pipe fittings with push-in joints produced by Tyler Pipe.

1968 - Tyler Pipe becomes subsidiary of Tyler Corporation, a family of companies in transportation, manufacturing and distribution.

No-Hub coupling sales top 5-million units. Wade Division introduces carrier fittings with TY-SEAL gasket joints.

1969 - TY-SEAL gasket sales pass 35-million total. Salem Pipe and Foundry Company, Bridgeton, New Jersey purchased to better serve Eastern markets.

1971 - 50,000,000th TY-SEAL gasket installed in Long Island, New York IRS Service Building.

1972 - ABS-DWV Plastic pipe and fittings are added to balance product line.

1973 - Utilities Division introduces 24" diameter fittings for cast iron and asbestos-cement pressure pipe.

1975 - ABS production facilities relocated to Tyler, Texas. Ten-inch No-Hub pipe and fittings introduced.

1977 - M. J. Harvey, Sr. founder and Chairman of the Board, passed away. Wade Division introduces new carrier fitting line for hubless piping systems. Utilities Division introduces 30" diameter fittings.

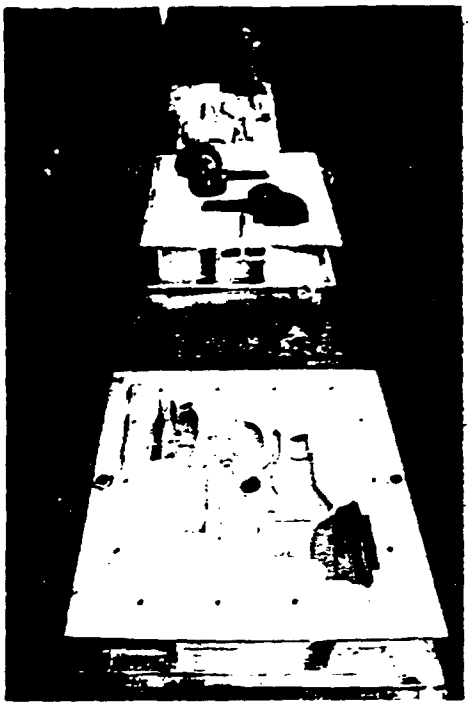
1978 - PVC-DWV Plastic pipe and fittings added to expand product line. Major Mid-East projects initiate export business. No-Hub coupling sales pass 50 million units.

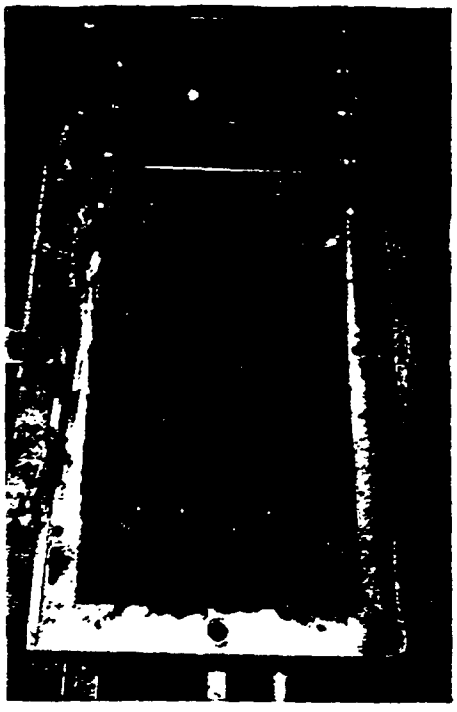
1979 - One hundred million TY-SEAL® gaskets sold. First stocking distributor selected in the Mid-East.

1980 - Wade introduces first gasketed push-on specification products.

1981 - Moldmaster unit begins production.











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