

Putzmeister

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Placing System Advantage

MORE THAN EQUIPMENT



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Putzmeister High Profile Projects

MGM CityCenter – Las Vegas

Trump Tower – Chicago

Trump International Hotel & Tower – Las Vegas

One Rincon Hill – San Francisco

JW Marriot – Michigan

Tacoma Narrows – Seattle

Central Library – Minneapolis

Brightman Street Bridge – Massachusetts

Columbus Towers – Chicago

Three Bellevue – Seattle

OHSU Biomedical – Portland

Step-by-Step Sequence Chart

Our specialists work with you from project start to finish providing technical expertise in specifying equipment, consulting on concrete mixes and designing an efficient placing system for maximum concrete coverage.

Planning/Bidding Stage:

- Review advantages with the contractor, including labor and time savings.
- Size the unit.
- Discuss location along with crane size to install and remove unit.
- Discuss rental rates and all costs with the contractor.
- Include freight, taxes, setup costs and insurance.

Pre-Installation Planning:

- Check boom location – no obstruction of slab opening for tower.
- Check pump location and layout of line, diversion valve and blowout area.
- Ensure size of boom with proper reaction forces given to the building's engineer.
- Determine length of tower and support floors.
- Make a climbing plan showing support floors and wedge points.
- Discuss how the unit will be climbed (with crane, self-jack or freestanding).
- Determine if reshoring is necessary to support the unit and check who will install.

Installation:

- Trucking and delivery.
- Crane scheduled.
- All equipment identified and on-site.
- Reshoring.
- Electrical power.
- Placing line route and fasteners.
- Slab opening and size checked.
- Location of vertical supports and horizontal wedges or corner details.
- Tower bolts properly torqued, where applicable.

Operation:

- Continuously check connections (bolts, pins, electrical and pipeline).
- Check radio remote.
- Continuously check wedges, supports and reshoring.
- Moving boom from mast to mast – check both towers.
- Watch pipeline life, including boom, tower and supply line pipe.

Dismantle:

- Schedule trucks.
- Crane clearance for tower removal. Tower may have to be dismantled.
- Removal of concrete piping.
- Fill in slab openings.



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PUTZMEISTER

PLACING BOOM SYSTEM ON-SITE

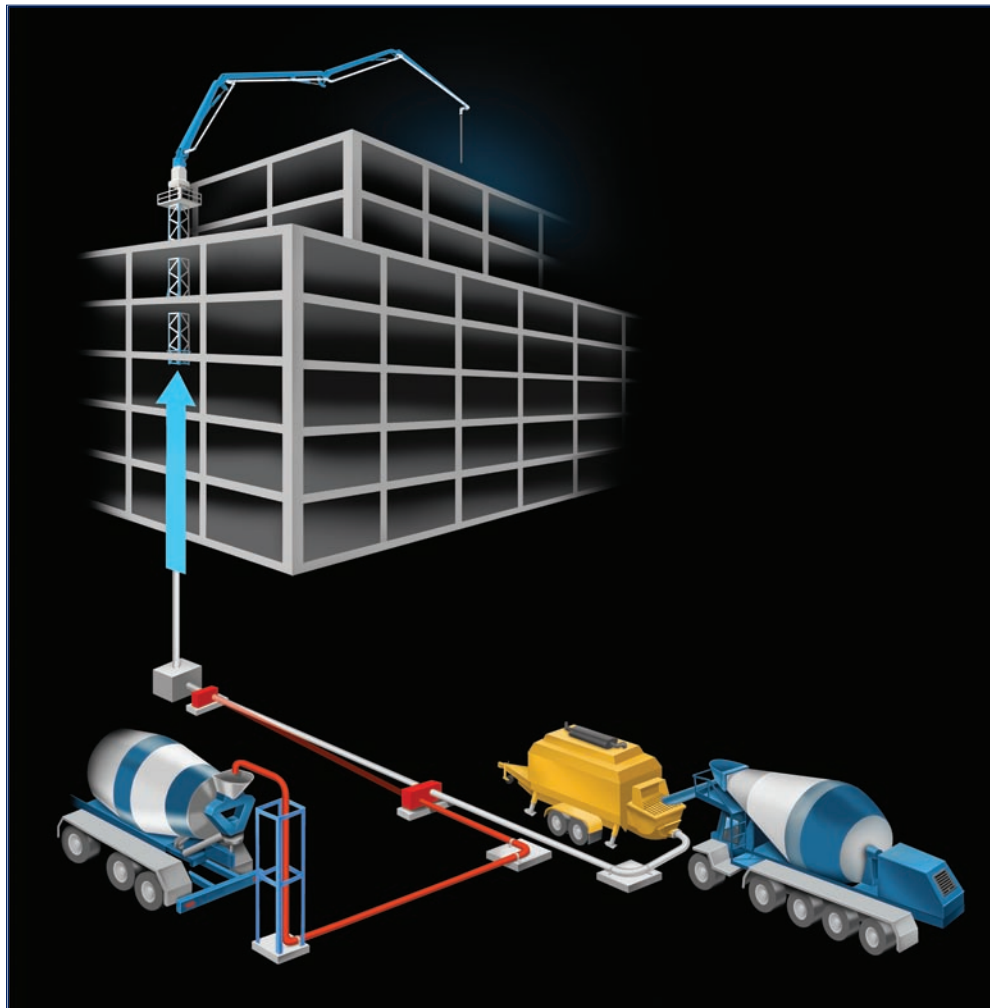
INTRODUCTION

How to Lay Out Components on a Job Site for Effective Use

For a typical project layout, consider the following:

- Traffic/lane restrictions.
- Mixer truck access.
- Straight forward line layout.
 - Minimize elbows.
 - Shortest distance.
- Multiple pour locations.
- Surge block locations.
- Clean out access.

Putzmeister can assist with all of these aspects.



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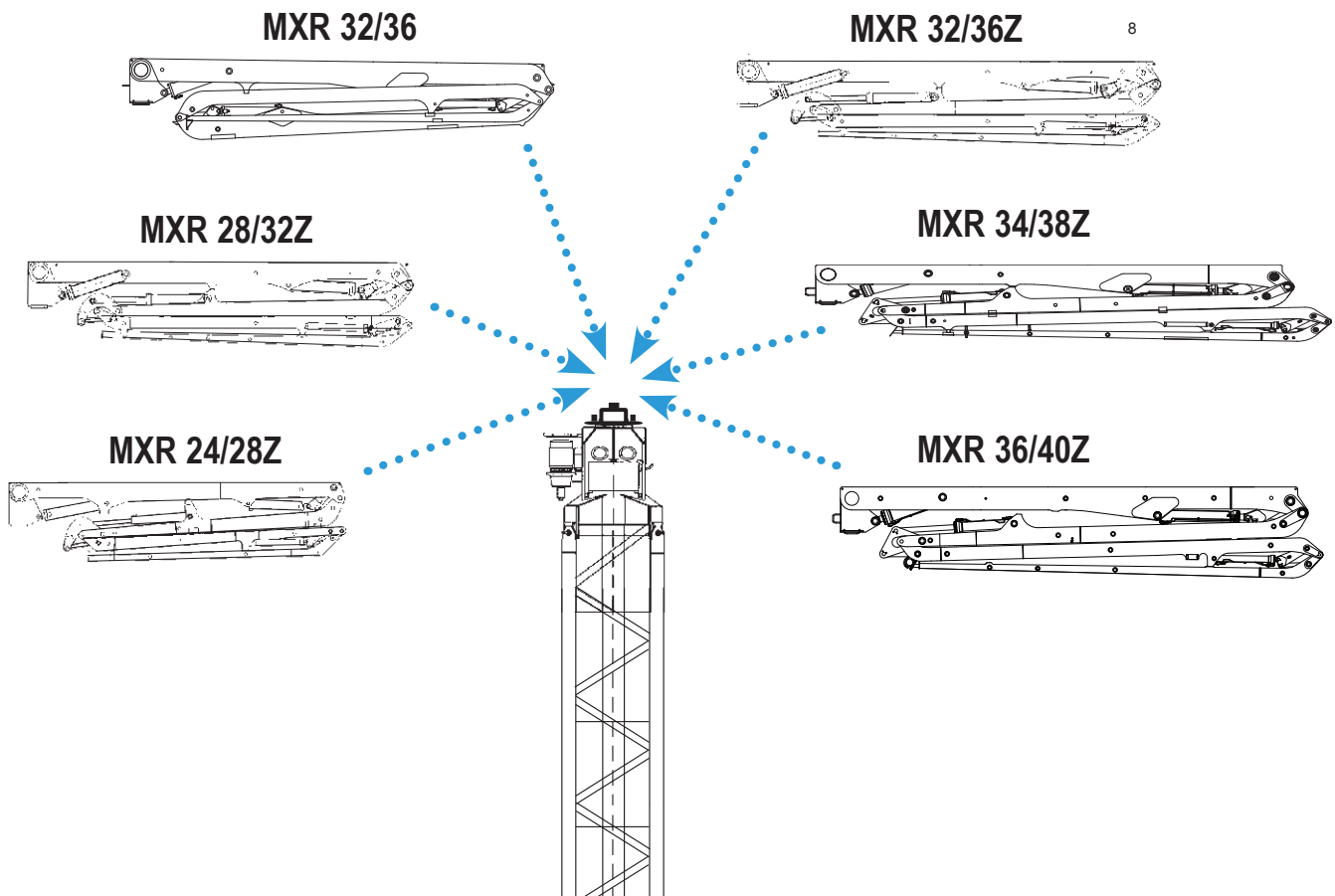


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FOUR STEPS TO PLACING BOOM SUCCESS

1. Choose Your Boom and Pedestal
2. Specify Pin or Bolt Towers
3. Define Your Mounting and Climbing Configuration
4. Order Your System

1. Choose Your Boom and Pedestal



Models	Horizontal Reach	Weight (Boom only)
MXR 24/28Z	78' 1" (23.80m)	8,713 lbs (3,952kg)
MXR 28/32Z	91' 10" (27.99m)	12,591 lbs (5,711kg)
MXR 32/36	105' 2" (32.05m)	13,880 lbs (6,296kg)
MXR 32/36Z	104' (31.70m)	13,239 lbs (6,005kg)
MXR 34/38Z	108' 7" (33.10m)	13,133 lbs (5,957kg)
MXR 36/40Z	115' 2" (35.10m)	13,144 lbs (5,962kg)
Larger boom models including the MXKD 38/42 are also available.		

1. Choose Your Boom and Pedestal

One Boom, Multiple Uses

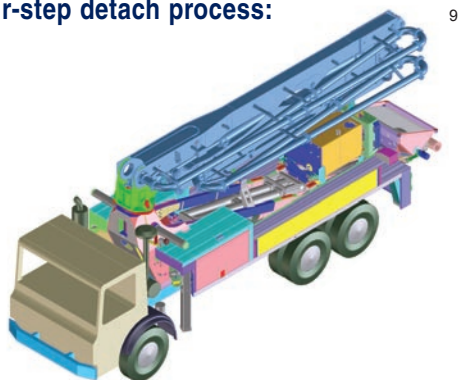
Detach Booms

For total boom versatility and convenience, request our detachable placing booms. This quick attach/detach kit is the perfect choice when transferring the boom on a frequent basis. The convenient two-piece slewing head features color-coded quick disconnect hydraulic fittings and easy alignment of the boom to pedestal pin. The pedestal can be left on the tower to

reduce the “fly” weight by 4,850 lbs (2,200kg), and it adapts to most Putzmeister pumps produced from 1985 to present.

Series II kits are available to fit your specific needs and can be installed with your initial boom pump order or added at a later date.

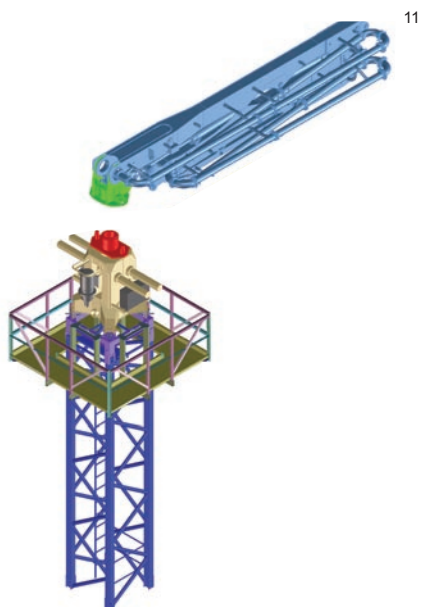
Simple four-step detach process:



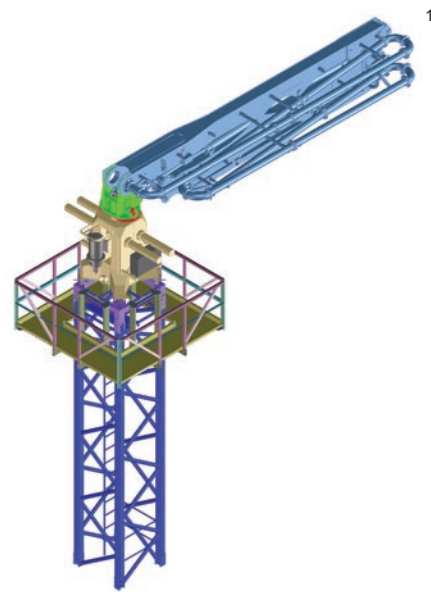
1. Detach boom and connect crane cables.



2. Lift.

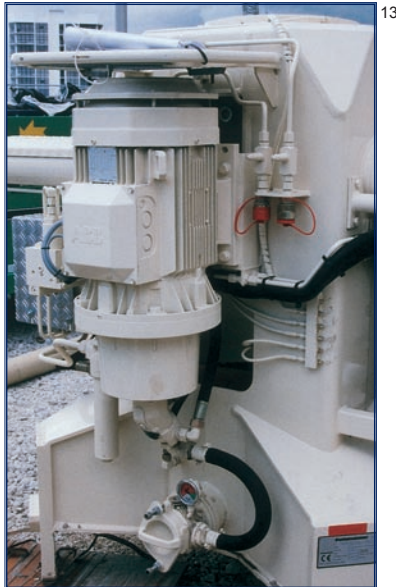


3. Position and connect pins.

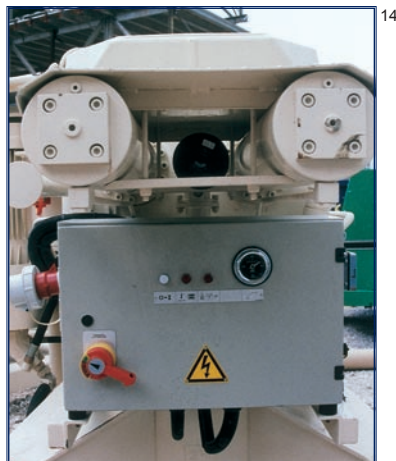


4. Unfold and pump.

1. Choose Your Boom and Pedestal



Closeup of pedestal with detail of filter assembly and lugs above the connection pins.



Electrical panel with convenient hour meter and hydraulic cushioning valves on the ends of the swing racks.

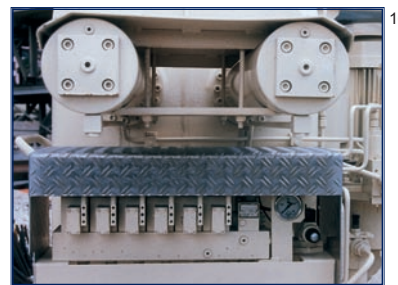
Putzmeister's Weight Efficient Pedestal is only 4,850 lbs. (2,200kg)

Lightweight placing boom and pedestal are separate components so they can be moved together or separately, depending on crane capacity on-site. Electric version shown.

Versatile Pedestal



Just lower the pedestal until the ears hit the lugs and it perfectly aligns itself.



Manual hydraulic valve controls and pressure gauge shown.

Note: The electric motor, grease fittings, quick disconnects for hydraulic climbing and compact electrical box make this package complete.

2. Specify Pin or Bolt Tower

Tower Design

Pin and Bolt

Pin Tower

Putzmeister's Pin System uses four heavy-duty pins instead of bolts for faster and easier connection in installing and raising the placing boom tower.

Tower sections are connected with four heavy-duty pins:

1. Set one tower section atop another section.
2. Insert four pins.
3. Secure each with a retaining pin.

Simple process done quickly for improved job site efficiency.

- No bolts during tower setup.
- No need for special tools.
- No time-consuming chore of torquing bolts.
- Smooth sides - no protrusions exist.
- Tower easily slides through floor openings without interruption while being raised.



Pin Tower Connection

Bolt Tower

Offering years of job-proven reliability and structural integrity, the Bolt System is a more traditional design.



Lightweight adapter is pin-connected for easy positioning and assembly by hand.



Closeup of bolt adapter and delivery line with boom and pedestal removed.



Bolt Tower Connection

2. Specify Pin or Bolt Towers

Square and Highly Modular Tower

Tower Design

Pin and Bolt

Only Putzmeister offers a square modular tower design:

- All Putzmeister MXR placing boom models can connect to the same PM pin or bolt tower.
- Highly modular for greater flexibility and adaptability to different applications.
- Square design allows for easy reshoring and simple bracing in building; uses only hardwood wedges.
- Square tower can be self-jacked or put on base plates or foundation anchors.
- Square floor openings are easy to block out and patch.
- Square design allows ladder access and protects the delivery line and connections all within the tower.

Tower Features:

- Available in varying lengths to accommodate job sites.
- Can be utilized with all standard Putzmeister MXR placing boom models – 24/28Z, 28/32Z, 32/36, 32/36Z, 34/38Z and 36/40Z – with horizontal reaches from 78' 1" to 115' 2".
- Several optional accessories are readily available for increased job site efficiency.
- Smooth sides without protrusions allow the tower to slide easily through floor openings.

Accessible Ladder:

- Strategically located inside the tower.
- Positioned on the vertical sides in an alternating pattern.
- Provides greatly improved access to delivery pipe and more space when climbing.

Pipe Connect:

- It's easy to mount pipe to the new tower using universal connections for the perfect fit every time.



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Pipe Connection

3. Define Your Mounting and Climbing Configuration

Putzmeister Offers the Most Mounting and Climbing Configurations in the Industry on Both Pin and Bolt Towers.



Freestanding



Freestanding and Ballasted Base



Adjustable Wall Bracket



Clamp Down Mounting Base



Inside Climbing



Hydraulic Climbing

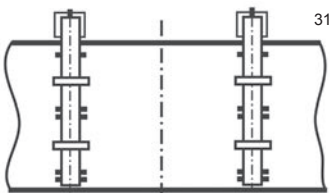


Universal Tie Frame

3. Define Your Mounting and Climbing Configuration



Foundation anchors shown with pin tower.



Foundation anchors



Foundation anchors shown with bolt tower.

Foundation Anchors and Base Plates

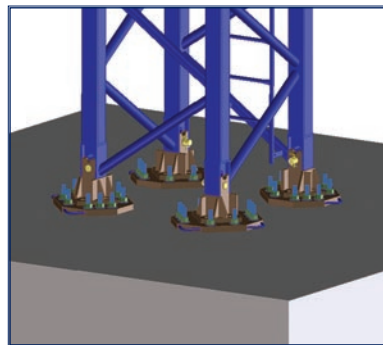
Using four foundation anchors or high strength foundation base plates, Putzmeister towers can freestand up to 80 ft. (24m) heights. Contractors realize greater savings when using Putzmeister foundation anchors and base plates because they are affordably priced and can be reused for future projects.

Freestanding Mounting Options

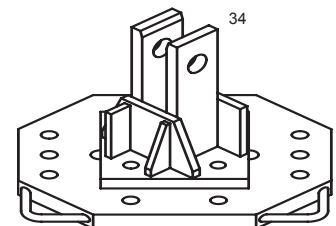
Pin and Bolt Tower

Foundation Base Plate Design:

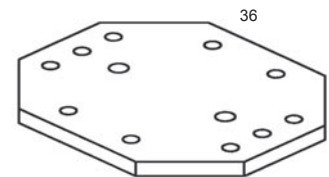
- Pin tower – each plate easily pins to the bottom of every leg on the square tower.
- Bolt tower – each plate easily bolts with a two-bolt connection to the bottom of every leg on the square tower.
- Ten 1-1/4" (32mm) threaded rods are embedded into a concrete pad around each plate.
- Uses common off-the-shelf threaded rods, available from local suppliers anywhere in the country.



Foundation base plate design for pin tower.



Foundation base plate design for bolt tower shown with grouting around the plates.



3. Define Your Mounting and Climbing Configuration

Freestanding and Ballasted Base Mounting Options

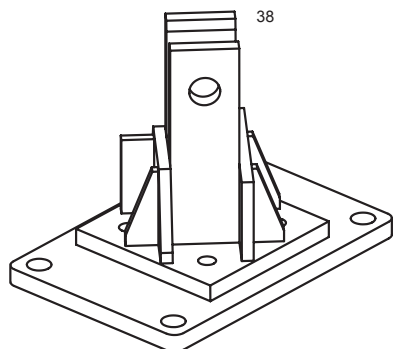
Pin and Bolt Tower

Floor Support Plates and Ballasted Base

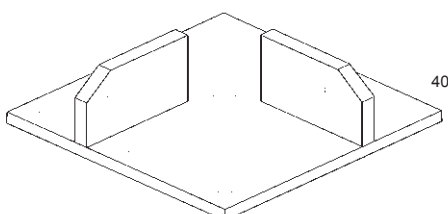
When starting out on an existing concrete slab, four floor support plates will enable you to safely mount pin or bolt tower.

The optional ballasted base is available for freestanding pin or bolt towers without a foundation.

- Base measures 15 ft. (4.6m).
- Pin tower kit requires additional kit for connection to base.
- Bolt tower kit connects directly to base.



Pin tower kit.



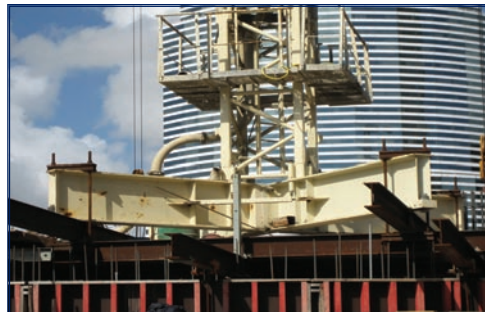
Bolt tower kit.



Floor support plates shown with bolt tower.



Pin tower on a ballasted base at the World of Concrete Mega Demos 2006.



Versatile ballasted base can be used as a clamp down base.

3. Define Your Mounting and Climbing Configuration



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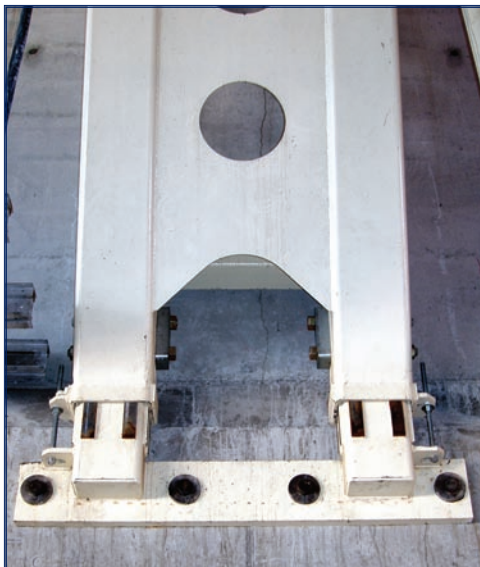
Adjustable Wall Bracket

A Putzmeister exclusive, a wall bracket that does NOT need to be anchored to the forming system – concrete can be pumped without any vibration to forms.

Adjustable Wall Bracket Mounting Options

Bolt Tower

- Setup and disassembly is quick and easy, as the wall bracket can be easily lifted by tower crane or raised with the forming system to be elevated.
- System can be used with any manufacturer's brand of self-jacking forms on the market.
- Same bracket can be used with all MXR Putzmeister America separate placing boom models, no matter what the boom weighs.
- Adjustable 12" (305mm) range on bottom connection easily aligns with concrete embeds.
- Wall bracket provides a platform to place a 50 ft. (15m) freestanding Putzmeister tower anywhere off the side of the concrete shear wall.



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Bracket Advantages:

- Maintain more precisely aligned forms for a far superior finished product.
- Control tolerances and reduce wear and tear on forms for significant cost benefits.
- Easily lift by crane or raise with the forming system when it is elevated.
- Fits within standard sized elevator shafts for convenient climbs.

Adjustable 12" (305mm) range on bottom connection easily aligns with concrete embeds.

3. Define Your Mounting and Climbing Configuration

Clamp Down Mounting Base Mounting Options

Pin and Bolt Tower

Clamp Down Mounting Base

Putzmeister's clamp down mounting base can be mounted on an existing foundation or structure and can be used with or without a tower.* Its versatile design enables it to:

- Accommodate tower heights from 10' (3m) to 80' (24m)
- Clamp to the floor truss work.
- Be used with self-climbing form systems where the base can become part of the framework and ride with the form scaffolding system for substantial time savings.

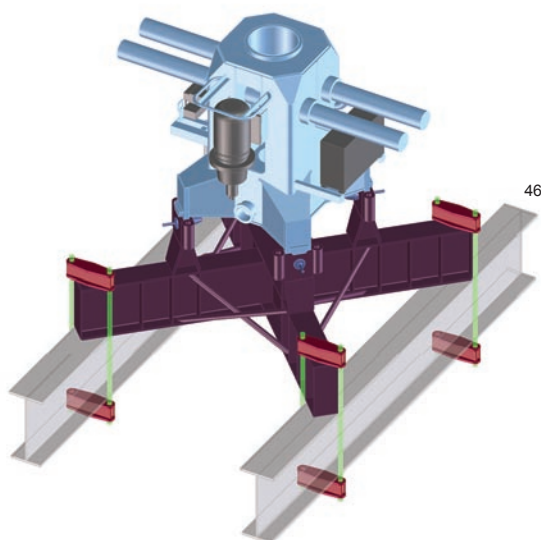
Advantages:

- Small and lightweight.
- Ideal for tight places.
- Flexible – can be used again in different jobs.
- Easy initial assembly.
- Efficient, even for smaller buildings.
- Perfect for barge applications.

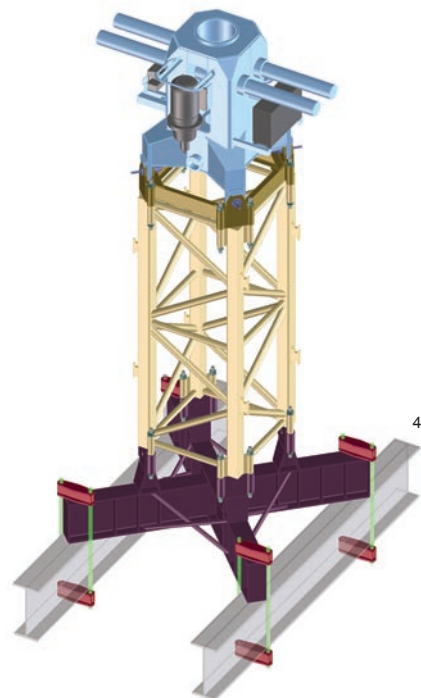
**Provided the foundation is strong enough to absorb necessary reaction loads.*



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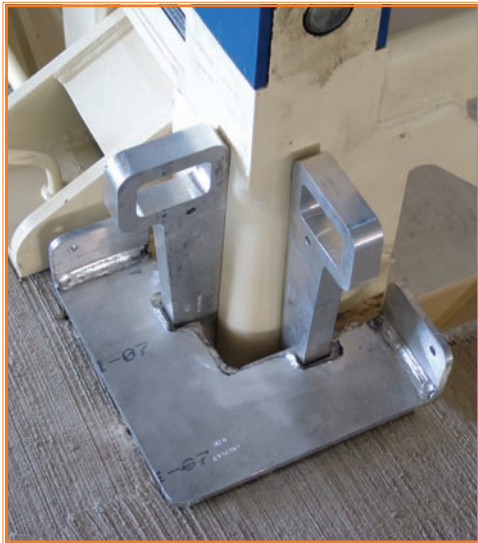


Pedestal connected directly to clamp down mounting base.



Tower connected to clamp down mounting base.

3. Define Your Mounting and Climbing Configuration



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Vertical Support

Advantages:

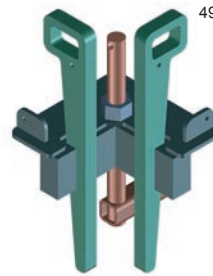
The Putzmeister vertical support design supports the vertical load of the entire placing boom. Once pulled into position, the design is ready to support the tower. All components are pin-connected for easy assembly and low component weights.

- Lightweight component is pin-connected to pedestal for easy positioning and assembly by hand.

Inside Climbing Configurations

*Pin Tower
Inside Static*

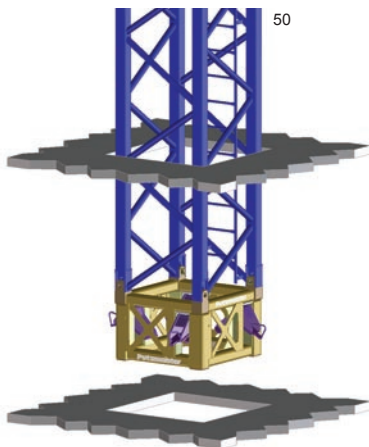
Corner bearing set for pin tower.



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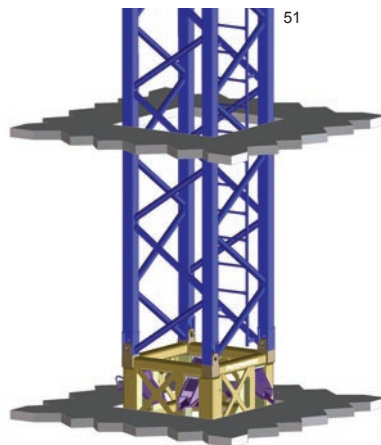
Pin tower corner bearing.

Pin Tower Procedure



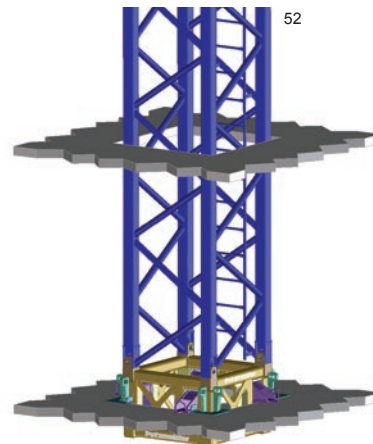
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Lift just past the desired floor level, then lower a bit.



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The tower automatically clicks into place.



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Shown with support feet (purple) positioned in place, and a corner wedge set added (green).

3. Define Your Mounting and Climbing Configuration

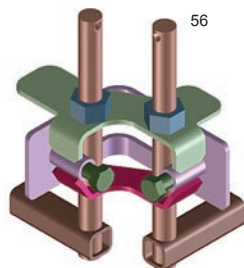
Vertical Support

Inside Climbing Configurations

Bolt Tower
Inside Static

- Vertical support can be attached anywhere on the tower.*
- Supports weight of the placing boom and tower inside the building.
- Maximum flexibility in slab opening, adjustment of tower elevation and reshoring design.
- Designed for easy disassembly and reassembly on each landing.

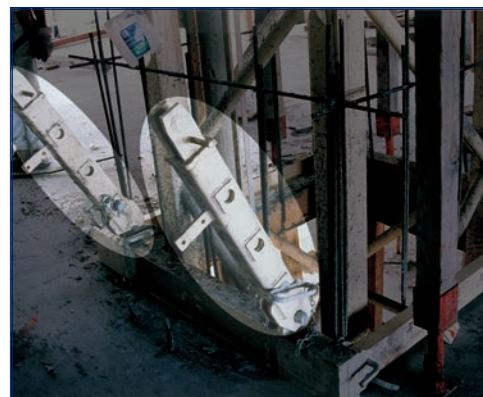
**Locations are limited on some applications.*



Bolt tower corner bearing.

Pin and Bolt Corner Bearings:

- Lightweight and easy to install.
- Support horizontal forces on unit.
- Guide the tower inside slab opening with our hydraulic climbing system and inside climbing system.
- Can be used instead of hardwood wedges to handle horizontal tower forces.
- Sold in sets of four.



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With floor frame assembled around tower, the support arms are pulled back to raise tower through opening. Bolt tower vertical support shown.



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Vertical support frame shown with support arms locked into lugs on tower, holding boom and tower inside the building. Bolt tower vertical support shown.



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Corner bearing set for bolt tower.

3. Define Your Mounting and Climbing Configuration

Hydraulic Climbing

Hydraulic climbing is required when a construction site crane cannot be used or is not available to pull up the boom when raising between floors.

Key Features for Both Towers:

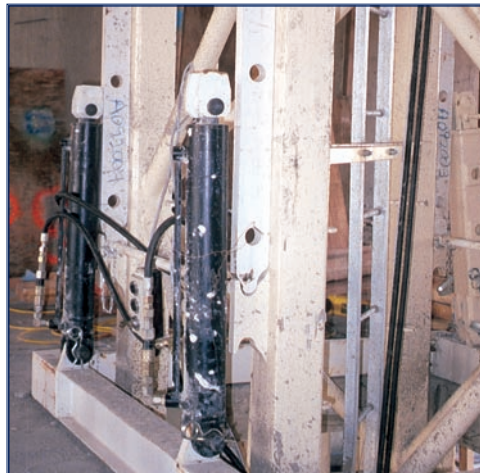
- Two hydraulic cylinders – each at 68 pounds (30kg) – quick disconnect from the hose.
- Hydraulic power is supplied by the pedestal.
- Lightweight components for carrying from floor to floor.
- Hydraulic hose inside tower is protected from construction.
- Quick disconnect to hydraulic cylinder provided.
- All components are pin-connected for fast installation and dismantle.

Hydraulic Climbing Configurations

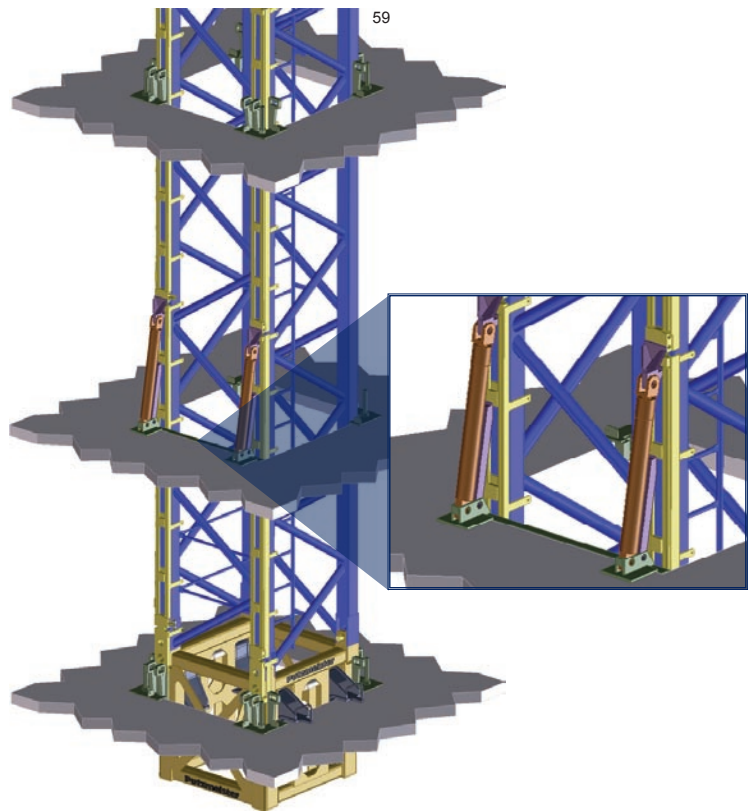
*Pin and Bolt Tower
Inside Static*



Pin Tower - Hydraulic cylinder, hose, lifting frame and 30 ft. (9m) of climbing ladder.



Bolt Tower - Hydraulic cylinder, rack set and hoses.



Pin Tower System

3. Define Your Mounting and Climbing Configuration

Universal Tie Frame Climbing Configurations

Pin and Bolt Tower Outside Tie-In

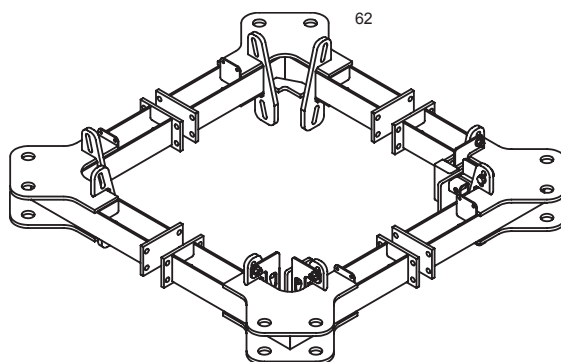
Universal Tie Frame

A universal tie frame* can be used to attach tower with tie-offs to a building – inside or outside.

Advantages:

- Supported by tower and tied to inside or outside the structure.
- Used for virtually unlimited tower heights.
- Versatile for applications including:
 - Freestanding shear walls.
 - Stand-alone cores.
 - Individual structures needing high walls and tower kept away from building.

**Pin tower requires a frame adapter kit.*



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Pin Universal Tie Frame Shown

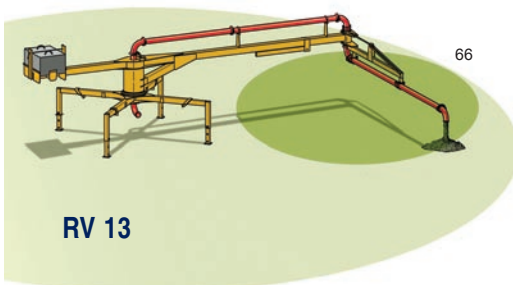
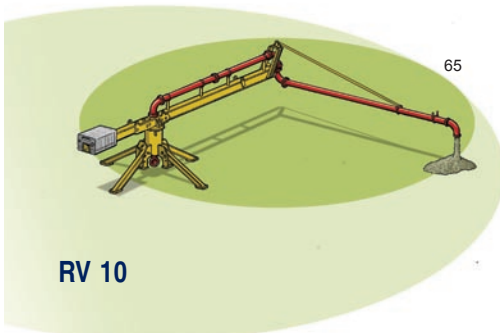
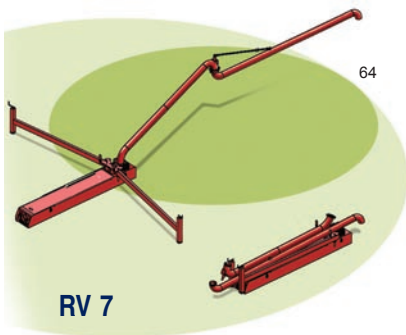
Additional System Options – RV Deck Placers

Expand Your Reach Capabilities

Advantages:

- Cost-effective solution for placing concrete when truck-mounted pumps can no longer reach within large surfaces.
- Ideal for complicated floor or bridge work.
- Two-section, manually operated units.
- Maneuvers into tight areas with a 360 degree articulating boom.
- Up to 4,860 sq. ft. (450m²) areas covered from one setup location.
- Avoids the extra labor and hassle of dragging delivery lines.
- Lightweight with compact dimensions, easy to move from spot to spot.
- Quickly transported on and off job sites via truck or trailer.

Additional System Options

RV Deck Placers

Model	Boom Radius	Transport Weight
RV 7	21.6 ft (6.6m)	1,345 lbs (610kg)
RV 10	32.7 ft (10.0m)	2,250 lbs (1,020kg)
RV 13	41.3 ft (12.6m)	3,285 lbs (1,490kg)



PLACING SYSTEM

EDUCATION

ADVANTAGE

The Right Pump Makes the System Successful

Once you've made your Placing System choices, it's time to select the concrete pump that will ensure maximum performance.

Concrete Pumps

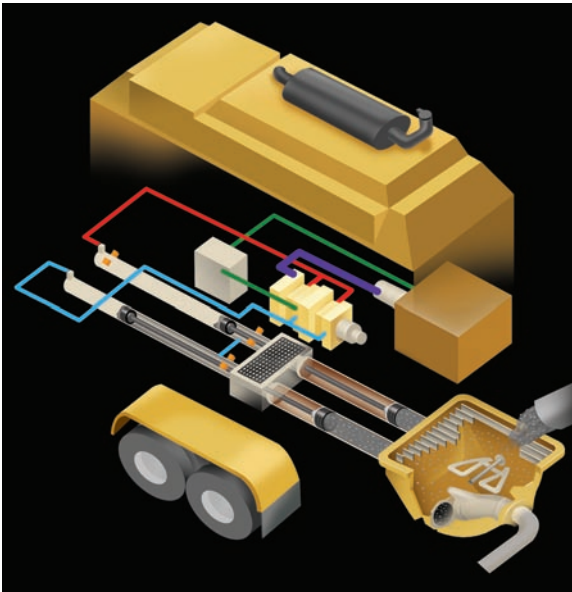
Putzmeister offers the versatility of truck-mounted concrete boom pumps with the Series II Detach Kit, as well as the BSA line of trailer pumps. Series II offers the fastest truck to tower conversion and the BSA 14000 is the most powerful model available.



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MORE THAN EQUIPMENT

Putzmeister



Putzmeister Free Flow Hydraulics in a Closed Loop System

Concrete Pumps

⁶⁹ The pumps at the heart of Putzmeister's free flow pumping system are bi-directional, variable displacement piston pumps. Depending on stroke, oil flows in a closed loop from either port A or port B on the pump to the hydraulic cylinders.

Depending on specific pump cell size, up to 20% of the oil leaves the simple closed loop system during each stroke through a flushing valve on the main pump and cycles to a cooler before it returns to the hydraulic oil tank. Removing and cooling only this minimal amount of oil is possible because, unlike an open loop system, the oil flows freely without passing through any unnecessary valves that can generate heat.

The closed loop also requires far less oil to run the system, resulting in a much smaller oil tank.

Speed and timing are also critical to superior performance. Quicker and more responsive than a hydraulic signal, the electrical system on a Putzmeister pump minimizes the time it takes to change direction at stroke end.

An electrical signal precisely synchronizes the drive cylinders with the accumulator system that controls the S-Valve in the hopper. Reserved energy stored in a nitrogen bladder is sent as a supercharged blast of oil at precisely the right moment to facilitate a smooth and fast shift of the S-Valve from one position to another.

Advantages:

- Changes in material pressure in the delivery line are reduced to ensure smooth pumping and a consistent concrete flow.
- The intelligent design eliminates wear-inducing pressure peaks, increases service life and makes our pumps extremely powerful.
- There is greater pump output due to the efficient use of all available energy.
- Rapid changeover of the stroke means higher outputs, a smoother flow of concrete and less boom or line bounce.

PUTZMEISTER

PUTZMEISTER EQUIPMENT SITE REPORTS

SITE REPORTS

ADVANTAGE

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Putzmeister is constantly adding site reports to our high profile projects résumé. Please visit the “news” section at www.putzmeister.com for a variety of application stories.

MORE THAN EQUIPMENT

PLACING BOOM

PLACING BOOM SITE REPORT

SITE REPORTS

Extremely Simple and Easy Four-Pin Connection of Putzmeister Placing Booms Reduces Time and Labor

Putzmeister's 28-Meter placing boom was the only logical choice for the development of a 17-story high-rise condo on Key Biscayne.



Two 50 ft. (15m) towers enhance the ability to pour decks as well as columns and walls in a very efficient manner.



⁷¹ Because of the building location, height and compressed schedule, a placing boom was the obvious choice for this project. The highly versatile four-section Putzmeister 28-Meter placing boom with 92 ft. (28m) reach and PM tower system were selected for several reasons. An extremely light flying weight and easy changing between tower sites was a huge time-saving feature – only possible because of no counterweight, a convenient four-pin connection, and an easy delivery line reconnection. Another plus was the simplicity of horizontal bracing using hardwood wedges and Putzmeister's unique lightweight vertical support system that on this particular job, could be used on any floor, anywhere on the tower.

When it was demonstrated that substantial savings in time and labor could be achieved by using the Putzmeister placing boom with two 50 ft. (15m) tower sites to pour decks, walls and columns, Erickson was awarded the job.

⁷² The first several floors were poured using Putzmeister 43Z-Meter and 52Z-Meter truck-mounted boom pumps. Then two towers were dropped into floor openings and used in conjunction with Putzmeister's high pressure 12000 trailer pump for the balance of the structure.

Configuration

Simple Bracing with Vertical Support

Placing Boom Owner

*Erickson Concrete Pumping
Boca Raton, Florida*

Authorized Putzmeister America Dealer

Thomas Machinery, Inc.

Did You Know?

Only Putzmeister offers the most mounting configurations in the industry – freestanding; inside building climbing via crane or hydraulics; outside building - tied to structure; along with mounting on a wall bracket; a universal tie frame, using special support beams or floor support plates; in addition to a clamp down, ballasted or traveling base.

Casting Time Cut Almost in Half with Use of Time-Saving Putzmeister Placing Boom

Putzmeister's 28-Meter placing boom becomes vital to making unique "segmental" bridge sections quickly and cost-effectively for Boston's Big Dig.

Configuration

Freestanding Precast

Eliminating the need for ready mix trucks by making their own concrete and using a placing boom for labor-saving continuous placement, Sanford Precast is projected to cut their casting time almost in half in comparison to other methods. Using an electric-powered, skid-mounted Putzmeister Thom-Katt trailer pump (model TK 50 with variable speed output and low surge delivery) in conjunction with their placing boom (model MXR 28/32), they are developing 1,600 precast bridge sections over a 2-1/2 year time frame.

The versatile four-section Putzmeister boom quickly unfolds inside the building and reaches over working personnel and equipment to place concrete in four, and sometimes, five separate "segment" forms each day. Since each form requires approximately 25 yds. of concrete, Putzmeister's TK 50, with maximum 50 cu. yd. (38m³) output, was teamed with their dependable MXR 28 boom for peak performance.

The boom is mounted in the center of the building, with the forms located on a circumference around it. The pump and batch plant are located about 120 ft. away at the building's edge to free up floor space.

The delivery line is placed in a trench across the floor and routed inside the boom's tower. This way, the line doesn't obstruct movement on the floor and is protected from accidental damage near the tower.

The 1,600 sections (with the largest ones sized 8 ft. tall x 10 ft. wide x 48 ft. long, and weighing up to 73 tons) will be hauled one by one via truck on a three hour journey to Boston for precise piece by piece insertion on the Big Dig project.

The project, named C-19B1, is anticipated to cost \$184 million.

Placing Boom Owner

*Sanford Precast - Sanford, Maine
(Division of Modern Continental)*



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Freestanding 28-Meter securely anchored to building's foundation.



74

Only 16 sq. ft. (1.5 m²) of floor space was used for the base in this airport hangar, which was converted into a precast plant.

Did You Know?

Segmental bridge sections are popular in Europe and the Middle East; however, they are now becoming more widely accepted in the USA. For the most part, the same holds true for placing booms.

Authorized Putzmeister America Dealer

*D&M Equipment Company
Fall River, Massachusetts*

PLACING BOOM

PLACING BOOM SITE REPORT

SITE REPORTS

Putzmeister Wall Bracket and Detach Boom Work Together for Efficient Utilization



⁷⁵ After pouring 2,750 cu. yds. (2,103m³) of concrete for the foundation of the 28-story Three Bellevue Center in Seattle, the next challenge was how to most effectively pour the building's concrete core using a detachable boom pump, but without securing it to the formwork.

This dilemma was solved with Putzmeister's unique wall bracket. Using the bracket, the Putzmeister placing boom and tower were attached to the wall of the building's core and kept two feet away from the forms. This allowed the boom, tower and forms to all move up together to the next level and then be put in place for new sections to be poured. It also prevented any vibration to the formwork for a more precisely aligned pour.

The concrete, 400 cu. yds. (306m³) per floor, was pumped from the ground through a five-inch delivery pipe 315 ft. (96m) up to the top of the structure. In the end, more than 11,000 cu. yds (8,410 m³) of concrete was poured for the core of this 471,635 sq. ft. (43,816 m²) building.

For the job, Putzmeister's innovative detach boom kit turned an existing 28-Meter truck-mounted boom pump into a separate placing boom.

Because of the ease in removing the placing boom from the bracketed platform, the detach boom could be easily taken down and used with a 28-Meter truck-mounted pump on other jobs during a seven-day cycle of pouring, curing and setting up the formwork for the next floor.

Configurations

Wall Bracket



Putzmeister Wall Bracket Eliminates Vibration Unmatched Versatility Allows Use with Any Self-Climbing Form System

Putzmeister's wall bracket addressed the vibration concerns of the formwork supplier assisting with the tallest building under construction in Omaha – the \$350 million 40-story First National Center.

Configuration

Wall Bracket

Peri Forms voiced concern over a placing boom interfering and placing forces on the formwork of the building core. As there would be 47 different form pours with this high-rise, each form must align perfectly. The slightest bump off would cause a mismatch with the very expensive and specially cut steel and granite pieces destined for the building's sides in the finishing process.

Typically, manufacturers tie off to a form and rely on it for support; however, this results in excessive movement. SS&L of Omaha, the authorized Putzmeister dealer, informed Peri Forms that Putzmeister's 50 ft. (15m) freestanding placing boom configuration mounted on their special wall bracket below the forms system would allow free and independent movement of the forms. Mere inches away, but not touching any part of the forms, the tower mounted on the wall bracket eliminated any vibration and kept the job running smoothly.

Once mounted, the Putzmeister wall bracket eliminated the need for valuable crane time. Its highly unique design allowed the Peri formwork itself to lift the boom, tower and bracket all at once as the center form was raised. By simply removing the "reusable" concrete embeds and reinserting them at the next level, the entire lifting process took less than 30 minutes – a shorter duration and less costly approach compared to using a crane.

The Putzmeister wall bracket can be used with any manufacturer's brand of self-climbing system, allowing it to be cost-effectively used on future high-rise projects where different contractors might be involved.

General Contractor

*Kiewit Construction
Omaha, Nebraska*

Formwork Supplier

*Peri Forms
Canonsburg, Pennsylvania*

Did You Know?

Wall brackets maintain precisely aligned forms, control tolerances and reduce wear and tear on forms. This results in cost savings for contractors and achieves a far superior finished product for customers.

Placing Boom Owner

*Hotz Concrete Pumping
Omaha, Nebraska*

Authorized Putzmeister America Dealer

*SS&L- Sales, Service and Leasing
Omaha, Nebraska*



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PLACING BOOM

PLACING BOOM SITE REPORT

SITE REPORTS

Being “Unique” Made a Difference in 15-Story High-Rise Addition

Did You Know?

After this four-year \$345 million expansion project is finished, the hospital will have doubled its size to 2.4 million sq. ft. The approximate total corridor length at this facility will then slightly exceed 11 miles.



80



81

Putzmeister tower seen passing through special support beams.



82

Looking down elevator shaft where 130 ft. (40m) of tower passed through special support beams down to the foundation slab.

Due to the highly unique installation of a Putzmeister placing boom and “130 ft. (40m) tower” through an elevator shaft, the contractor saved precious time in completing a 15-story addition to the largest pediatric hospital in the US – Texas Children’s in Houston.

Although using a 32-Meter separate placing boom and tower was the most efficient and logical approach, there was not enough strength in the existing floor to support it. To combat this, the general contractor used special support beams on two levels to horizontally brace the tower inside an elevator shaft. With the vertical load resting on the elevator’s foundation, the Putzmeister tower was extended to 130 ft. (40m) – an extremely impressive height for a placing boom tower.

Adding 80 ft. (24m) onto Putzmeister’s standard 50 ft. (15m) tower while using only two horizontal braces proved to be a highly specialized installation process. It was only possible due to the “square” tower’s already versatile and sturdy design. Plus, this unique installation saved time, as it didn’t require additional bracing of the high strength tower itself.

Because two towers were needed for this project, the above approach was implemented using two vacant 8 ft. x 8 ft. (2.4m x 2.4m) wide elevator shafts purposely built in 1991 for expected expansion. The shafts housed the 130 ft. (40m) towers to place concrete on the sixth and seventh floors. Then the adaptable PM towers were pulled to the sixth floor and vertically braced. Climbing inside the building on every other level until reaching the 20th floor, the towers stood up to 26 ft. (8m) over the top brace without the need for counterweight – another exclusive and laborsaving Putzmeister feature for a placing boom this large.

The pump delivered about 90 yds. an hour (82 m/hr), while the placing boom stretched to 105 ft. (32m) horizontal lengths to place approximately 380 cu. yds. (290 m³) of concrete in the first pour of each floor. The boom was then quickly flown to the next tower and handled the remaining 340 cu. yds. (260 m³) of the building.

Configuration

*Simple Bracing with
Vertical Support*

General Contractor

W.S. Bellows Construction Corp. Houston, Texas

Putzmeister

MORE THAN EQUIPMENT

PLACING BOOM

PLACING BOOM SITE REPORT

SITE REPORTS

Exclusive Putzmeister Equipment Combination Accelerates Pace of High-Rise Construction

A congested job site benefits from the exclusive features found on a combination of Putzmeister equipment – BSA 14000 trailer pump, 38-Meter placing boom and new adjustable wall bracket. Keeps job on a fast track.

Configurations

Adjustable Wall Bracket and Corner Wedge

Although already crowded with skyscrapers, downtown Chicago keeps making room for even more high-rise structures. The latest one under development is Columbus Towers. After completing its six-floor parking garage, a 52-story apartment building will follow for a total of 58 levels ready for use and occupancy in the fall of 2002.

Keeping in line with the fast pace of the Windy City, this particular contract is calling for an unbelievably fast completion as well. It requires one apartment floor to be placed every three days in comparison to the more common five to six day schedule per floor.

Added to this challenge is the fact that the structure going up is in a very tight area on Columbus Drive, bordered by bridges on three sides and another high-rise on the fourth.

"Because of the close quarters and height, we had to use a trailer pump rather than a boom pump, and one with enough power to get the very dense, high strength concrete up that high," said Selton "Sam" Sampson, concrete superintendent with James McHugh Construction in Chicago, the general contractor. "This concrete is much harder to push than normal weight concrete."

To push the concrete, Sampson is using a Putzmeister BSA 14000 HP-D trailer pump, which is capable of pumping 134 cu. yds. an hour (102m³/hr) at 2176 psi (150 bar).

The unit is pumping concrete to a 38-Meter Putzmeister placing boom attached to a square placing tower supported by a Putzmeister adjustable wall bracket. This special combination of equipment helped keep the project on its fast track.

Putzmeister introduced the 38-Meter as its largest placing boom on the market that does not require counterweight.



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Did You Know?

Only Putzmeister provides a wall bracket that does NOT need to be anchored to the forming system – concrete can be pumped without any vibration to the forms.

McHugh found its extensive 111 ft. (34m) horizontal reach a necessity for the greatest coverage and its light weight important for using on-site crane capacity.

Plus, moves could be done quickly without the hassle of counterweight, which saved time: a precious commodity with this job.

Putzmeister worked in conjunction with McHugh and Peri Forms, the formwork supplier, to develop a new, adjustable version of their existing wall bracket to accommodate the larger sized 38-Meter placing boom. Plus, the adjustable feature would make lifts easier with a bottom connection that had an adjustable range of 12-in. (305mm) for better lining up with the concrete embeds.

The newly designed wall bracket proved its worth. It was attached to the side of an elevator shaft, but not anchored to the formwork. This meant no vibration to the forms for a far superior finished product and reduced wear and tear on the forms for cost savings. Setup and disassembly was also quick and easy, as the wall bracket was easily raised with the forming system when it was elevated. It could have also been raised by crane if preferred.

Will pour a total of 38,000 yds.

Sampson said, "Including the parking area, we'll eventually pour more than 38,000 cu. yds. (29,053m³) before we're finished."

Fortunately, the smooth operation of the Putzmeister placing boom and the long strokes of the most powerful trailer pump on the market today help to make the concrete placement both safe and efficient.

"I can't say enough about that trailer pump," said Sampson. "It's perfect for a job in downtown Chicago where you don't have a lot of space and yet have to go up pretty high."

He had used a Putzmeister trailer pump to pour the floors of the 74-story Park Hyatt. Located on Michigan Avenue in Chicago's historic Water Tower Square, this hotel opened in June 2000. "After seeing what it could do, and because

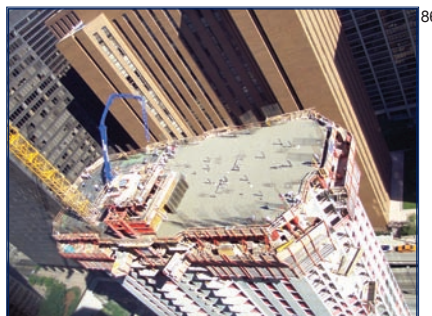
of the jobs we had coming up, we decided to buy one," said Sampson.

He also noted that the trailer pump would be put to good use in the months ahead because their job plate is full for some time to come and the trailer pump should pay for itself in a short time.

Due to the success of this job, the adjustable version is now the "standard" style of the Putzmeister bracket. This same bracket can be used with all Putzmeister standard MXR separate placing boom models, no matter what the boom weighs, and used with any manufacturer's brand of self-jacking forms on the market today.



Peter Spear, McHugh's Equipment Superintendent stands next to the wall bracket.



58-story high rise relies on 38Z-Meter and BSA 14000 trailer pump to quickly handle concrete job.

Clamping Down for Increased Productivity

Efficiency of Putzmeister Clamp Down Base Changes
Thinking on How All High-Rises Should Be Built

Lancaster, a 30-story residential complex, is the first of several planned high-rise structures being built in the new Lakeshore East development within the downtown Chicago Loop. Under an extremely fast-paced time frame, the building is also the first to be constructed using a more efficient way to place concrete by the general contractor.

Configurations

*Clamp Down
Mounting Base*

Instead of climbing a placing boom tower in a previous manner, the general contractor is the first to use a specially designed Putzmeister clamp down mounting base for increased productivity in constructing the 324 ft. (99m) tall building.

The general contractor is James McHugh Construction, a family-owned business established in 1897. The \$250 million McHugh company is known as a concrete innovator, and thereby receptive to new construction techniques.

Putzmeister's development of the special clamp down mounting base accommodated McHugh's request for a different way to construct the Lancaster project. Ironically, the huge success of the base is making the contractor take another look at how all high-rise structures should be constructed in the future. This includes smaller 18-story buildings that may have considered a placing boom impractical in the past.

According to Ken Hoyle, the project's superintendent, "Because of the clamp down base, we can do an 'easy' three day schedule. With this mounting design, we eliminated an entire step in raising the base, and that helps save a day overall."

Hoyle added, "With an 'easy' three day approach, even if it rains for half a day or another problem occurs, we still have enough time to absorb any minor delays without affecting the cycle."

Used with a self-climbing form system, the base conveniently becomes a part of the framework and rides with the system, as it's hydraulically raised within the core. Since the base is not independently connected to any tower, but instead moves with the forms, substantial time savings are realized.



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Did You Know?

Putzmeister's clamp down base is unique because it can work with or without a tower, plus be used over again in other jobs.

The initial assembly was also less involved, as the base was merely clamped down to structural beams, which were reinforced to a load factor of 48,000 lbs. (22,000kg). This was necessary to absorb the reaction loads needed to accommodate the 18,000 lb. (8,200kg) MXR 34/38 placing boom and its pedestal when at a full 111 ft. (34m) horizontal reach.

Using a placing boom with a longer reach also provides a greater area of coverage when placing concrete. This means the boom can remain in the same location without crane moves or adding extra delivery line. In addition, Putzmeister placing booms do not require counterweight, so this also makes the process run even smoother.

Meanwhile, the back end of a Putzmeister 32-Meter concrete boom pump is used like a trailer pump to push the concrete up.

Hoyle said, "Because of the effective setup, we're getting about 115 yards an hour (105m/hr), which is 40 yards (36m) more than expected. Of course, the faster you place the concrete, the faster you can get to the next step."

The aggressive three-day construction cycle for each floor now begins with the placing boom placing concrete for the deck for three hours in the morning of the first day. A special accelerator in the concrete allows the 13,700 sq. ft. (1,272 m²) area to harden in about three hours.

As the concrete cures, the crew cleans up, reprimers and then starts pouring the vertical interior and outside columns in the afternoon. A total of 430 yds. (393m) of concrete is placed per level. In addition, 60 percent of the floor frame for the next upper level is accomplished the same day. For the most part, the carpenters, laborers, finishers and ironworkers must then complete their portion of the job within the following two days.

"The 'two-day work, one-day pour' process is ready to repeat itself once a floor is finished and the placing boom and pedestal are raised," said Hoyle. "To get to the next level, we basically disconnect the riser line and jack up the

core system with the boom, pedestal and base attached. We then reconnect the riser line, and we're ready to pump again. It's that simple. Since we don't have to break from a tower, we're saving about three guys doing four to five hours of extra work."

McHugh predominantly purchases their own construction equipment for added control in scheduling their jobs. According to Pete Spear, Equipment Superintendent for McHugh, "All the placing equipment is working exceptionally well, especially the clamp down method. It saves a tremendous amount of labor because it's really fast. We discovered a few helpful tricks along the way so now there's no fooling around when it's time to elevate the system to the next floor."

Spear also noted that, "The clamp down base is small, lightweight and has a flexible design so we can and do plan to use it over again in other high-rise projects being planned."

Although this job's setup used the clamp down base at zero elevation without a tower, it can also be used with a tower. Therefore, McHugh has the flexibility of attaching it to an 80 ft. (24m) freestanding tower for climbing or to a 20 ft. (6m) tower within the form frame system to accommodate future requirements.

Overall, the convenient process has McHugh rethinking other projects that could benefit from the overall time efficiency of using a placing boom with the base versus other alternatives.

The Lancaster project will consume over 18,500 yds. (16,916m) of concrete, which includes an adjoining post-tensioned four-story garage with a multi-strand constructed bridge over the top of it, along with the 30-story high-rise building itself. Plans are to complete the entire Lakeshore East development by 2010.

General Contractor

*James McHugh Construction
Chicago, Illinois*

Big Bridge, Big Equipment

Putzmeister Technology Helps Build Concrete Bridge with Greater Efficiency

At a point where the blue waters of the Puget Sound become a narrow channel almost a mile wide, the Tacoma Narrows Bridge, one of the largest suspension bridges to be built in the US in 40 years, connects a gap from the Washington mainland to the Olympic Peninsula.

Configurations

*Clamp Down
Mounting Base*

Freestanding

The location south of Seattle, Washington, presents significant challenges, as the Tacoma Narrows is located in a seismically active area complicated by high winds, 15 ft. (4m) tidal swings, and seven-knot currents.

The first cable-suspended bridge was built there prior to WWII. However, it was a failure, nicknamed "Galloping Gertie" for the way it swayed in the wind. The bridge collapsed about four months after it opened in 1940.

As a result, its replacement was a more aerodynamically sound steel bridge, and today it is the fifth largest suspension bridge in the United States. However, since the bridge's opening in 1950, traffic volume has soared to over 90,000 vehicles a day – 30,000 more than the maximum for which it was intended. Therefore, it became paramount to construct another bridge to reduce traffic congestion.

The new 2007 Tacoma Narrows Bridge will be 5,400 ft. (1,645m) in total length, 2,800 ft. (853m) in the main span. Being constructed directly parallel to the current Narrows Bridge, it will provide three eastbound traffic lanes, shoulders on both sides, and a separate bicycle/pedestrian path. Meanwhile, the current bridge will be reconfigured to carry three westbound traffic lanes.

Although the center lanes of the two bridges will only be 200 ft. (60m) apart, the two structures won't look alike. The existing bridge towers are green and made of steel.

The new bridge towers will be a coated gray with pigmented sealer and built of reinforced concrete. That's because today's technology makes concrete much more practical than steel as a more cost-effective medium and with significantly lower maintenance.



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Artist's Rendering



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Concrete travels via a five-inch delivery line located along the current bridge.

After concluding the design, the first major task was to construct two of the largest caissons ever built, forming the foundation for the 510 ft. (155m) tall piers.

Each caisson – equivalent to a 20-story underwater building – contains 38,000 cu. yds. (29,053m³) of concrete and can accommodate the weight of a second deck (either road or light rail) in the future.

Proposals of how to efficiently concrete the caissons were presented to the firm of Tacoma Narrows Constructors, a joint venture of Bechtel and Kiewit Pacific.

Product specialists Bill Carbeau of Putzmeister America and Rolf Dose of Putzmeister-AG in Germany masterminded a strategic plan for the project.

First, the technical plan allowed for pumping concrete from land versus hauling concrete on a barge. Therefore, ready mix trucks could conveniently discharge directly into a concrete pump's hopper from shore.

Concrete would travel via a five-inch delivery line along the current bridge until it was necessary to cross down 165 ft. (50m) and over to a pumping barge.

At that point, a ramp would hold the delivery system, which had two five-inch steel braided Putzmeister hoses to accommodate the tide.

Second, the use of Putzmeister's advanced ZX pipeline alleviated environmental concerns about concrete spillage in the water. ZX delivery line and couplings are leakproof and rated for extremely high pressures.

Bill Carbeau, Telebelt® and Specialty Products Sector Manager for Putzmeister America, said, "The ZX pipeline and couplings were originally designed by Putzmeister for use in sewage treatment plants where it's critical to prevent leaks. However, the technology was successfully applied in this application, and it proved to be absolutely leak free and trouble free."

A third factor in selecting the plan was the pumping equipment's design. The proposed Putzmeister BSA 14000

concrete trailer pumps were the only units to offer both the high volume and high pressure combination needed for pumping concrete on the job. The units have electric twin motor drives and were capable of outputs up to 130 cubic yards an hour (99m³/hr). Their maximum pressure is 3,190-psi (220 bar).

Finally, no counterweight on the placing booms was required, even with the larger sized models selected for extended reach. The lack of counterweight was a significant factor to keep the center of gravity as low as possible on the barge.

Therefore, with a 125 ft. (38m) horizontal reach, the Putzmeister MXKD 38/42 placing booms were selected. They were deemed both long enough for efficient concrete placement and high enough to clear the rebar above the pour.



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A ramp holds the delivery system, which features two five-inch steel braided hoses.



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A Putzmeister DVH 5/2 diversion valve assists in the process.

PLACING BOOM

SITE REPORT

SITE REPORTS

Caisson Construction

Once the Putzmeister strategy was selected, developing the two needed caissons was a “go.” At the nearby Port of Tacoma site, 62 ft. (19m) high steel forms were built atop a cutting edge, which is the base of a caisson. The bottom edges of this structure are tapered so they cut through the seabed as a caisson is lowered into place.

Ultimately the BSA 14000 pumped concrete into its walls, whereby a caisson started. Because of the weight, the structure dropped 30 ft. (9m) beneath the water’s surface as planned. Both caissons were initially prepared in this manner.

In July of 2004, three tugboats towed the first caisson to the construction site 11 miles (18km) away. The theory was for the ingoing tide to bring the caisson in from the port and the outgoing tide to handle the final maneuvering.

Nothing is simple, however, when the present 15,240 ton structure is being towed. At this point in its development stage, the caisson was essentially a seven-story high box, 130 ft. long, 80 ft. wide, 80 ft. tall (40m x 24m x 24m) – and partly submerged.

The days following, the structure was precisely maneuvered into position. With only a small margin of error allowed, divers used GPS to locate and thus help secure the caisson with cables to prepositioned anchors embedded in the Tacoma Narrows floor. Later in August, the second caisson traveled to its final destination and was handled in the same manner.

Over the next few months, the two structures - mostly hollow and each floating on 15 steel air domes - gradually sunk as a series of 10 ft. (3m) reinforced concrete walls were added atop each caisson.

Two MXKD 38/42 placing booms were responsible for simultaneously placing the concrete; and each had the ability to cover the other’s area as a backup measure - although this proved unnecessary as no technical problems were encountered. The average output was 60 cu. yds. (54m³) an hour with line pressures as high as 2,000 psi (138 bar).

The bigger placing booms required larger versions of the company’s standard modular design towers. Bill Carbeau

noted, “Two freestanding 40 ft. (12m) towers were bolted to a single floating barge, where it was necessary to flood the chambers to achieve a zero-degree elevation with no more than a plus or minus three-degree list. This was to offset the loads imposed by the two booms, which were mounted next to each other on the same side of the barge.”

From land, concrete was pumped by two BSA 14000 concrete trailer pumps, each using 1,500 ft. (457m) of ZX delivery line to reach one caisson. Meanwhile, the placing booms placed an average of 1,200 cu. yds. (917m³) of concrete in a day pour.

Then the barge moved to the caisson on the other side of the Puget Sound to pump the following week. To pump the other caisson, two BSA trailer pumps were now set up on the other side of the bridge using 2,200 ft. (670m) of delivery line.

Overall, this flip-flopping approach meant the 210 ft. (64m) tall caissons could be built in a concurrent manner. When completed, the cutting edge was sealed with concrete, and eventually went through about 150 ft. (46m) of water and 60 ft. (18m) of seabed to reach solid footing.

The crew never encountered even one minor problem with the high pressure trailer pumps or separate placing booms on the highly technical job.



With 125 ft. (38m) reaches, the placing booms proved to be long enough for concrete placement and high enough to clear the rebar above the caisson pours.

Pier Construction

Pier construction started in September 2004. Because of the success in pumping the caissons, Putzmeister equipment was also utilized for pumping the piers.

Therefore, before being disassembled, the existing placing boom setup was used to place concrete as high as the units could reach - another 70 ft. (21m) above the caissons.

The same Putzmeister BSA 14000 trailer pumps were set up underneath both ends of the new bridge, again using a total of 3,700 ft. (1127m) of ZX pipe to deliver the concrete, but this time to a bucket.

The bucket, in turn, placed the concrete in the tower's forms, which could only withstand a maximum of 24 cu. yds. an hour (18m³/hr).

When reaching the struts, a BSA 14000 trailer pump will pump the concrete all the way to the top of the strut's 140 ft. (42m) height, while a tower crane assists by holding the pipeline.

A system of concrete forms called "bird cages" is being used to build each leg of the hollow towers in 17.5 ft. (5m) increments. With each caisson and pier nearly as tall as Seattle's Space Needle, they will consume a total of 16,000 cu. yds. (12,232m³) of concrete when completed in April 2005.

Of special note is the concrete mix for the piers. It is both strong and dense to keep salt spray and acid rain from penetrating the piers' steel skeleton, and it incorporates plasticizers and fly ash. Typically, bridge tower specs call for a 7,000 psi (483 bar); however, this mix is closer to 11,000 psi (758 bar).

Cable Anchors

Telebelt® conveyors are placing concrete to anchor the cables for suspension. "Truck-mounted Putzmeister belt conveyors are an ideal solution because they can place the larger size aggregate fast and without the possibility of plug-ups," noted Carbeau. "When finished, the two cables will each consume 26,000 cu. yds. (19,878m³) of concrete."

The new Tacoma Narrows Bridge is expected to open in 2007. Upgrades to the existing Tacoma Narrows Bridge will be completed in 2008. Overall, the project cost is presently estimated at \$849 million.

When finished, the overall project will have consumed over 255,000 cu. yds. (194,961m³) of concrete.



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General Contractor

Tacoma Narrows Constructors - a joint venture of Bechtel and Kiewit Pacific

Concrete Placing Equipment

- Putzmeister MXKD 38/42 separate placing booms (2) and ZX delivery line
- Freestanding 40 ft. PM towers (2)
- BSA 14000 trailer-mounted pumps (3)
- TB 105 and TB 130 Telebelt® conveyors
- Putzmeister boom pumps - all sizes
- Putzmeister hydraulic diversion valves
- Putzmeister clamp down mounting base

Power Plant Construction Needs Powerful Equipment Putzmeister Equipment Meets Concrete Placement Demands of Eastmain-1 Dam and Powerhouse Project

A wide variety of Putzmeister equipment assists in several construction aspects of the massive Eastmain-1 project for Hydro-Québec.

Configuration

Ballasted Base

The ongoing energy development of Hydro-Québec is part of a \$2 billion project undertaken by SEBJ – Société Énergie de Baie James. For Hydro-Québec, SEBJ has been instrumental in the development of a very rich hydroelectric area via numerous power stations installed since the 1970s.

In particular, construction of the new Eastmain-1 hydroelectric power plant – located on the Eastmain River near James Bay – is designed to generate 480 megawatt of electric power for Hydro-Québec.

The project – underway in a desolate region in northern Québec – includes a powerhouse, a main dam across the Eastmain River, the spillway on the river's right bank, and 33 dikes for reservoir closure. Construction was broken down into five major contracts, awarded independently via open public bids.

The largest of all structures being built is the 150 ft. (50m) tall, 410 ft. (125m) long and 180 ft. (55m) wide powerhouse – where three huge turbines will generate the power. This surface powerhouse, built into a rocky hill, is on the left bank of the Eastmain River. By the time the water exits through the tailrace, it will have dropped over 200 ft. (60m) from the water intake. This head, combined with the flow, develops kinetic energy that causes the turbines and generators to turn, producing electricity.

In particular, the major \$108 million Canadian powerhouse, penstocks, and water intake project were started in the spring of 2004 under the direction of Canadian contractor Aecon Hochtief. The Aecon Group is Canada's largest publicly traded construction company, and the group is 49 percent owned by German construction giant Hochtief (parent of US-based Turner).

To help place concrete more efficiently, Pompack, Inc. of Pointe-Claire, Canada is supplying the concrete placing equipment for the major feat.



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Did You Know?

The web site - www.hydroquebec.com - offers detailed information along with photographs and animated illustrations, which help guide you through the entire and unusual construction process of Eastmain-1.

In particular, the contractor needs reliable equipment, as Montreal is the closest inhabited area at over 750 miles (1200km) away. Therefore, if a machine fails in the job's isolated location, it costs an exorbitant amount in down time.

Project Manager Ken Chryssolor of Aecon Hochtief said, "For over 30 years, I've worked on huge jobs within James Bay so I know how difficult the abrasive granite mix is to pump. As we needed high performance equipment that could handle the tough aggregate mix, we're depending on all Putzmeister products."

For the specific powerhouse and water intake project, the mix of equipment includes two BSA 2109 H-D high pressure trailer-mounted concrete pumps, a JT 5000 jumbo trough mixer, and two PM towers for mounting specially modified MXR 30Z-150 separate placing booms. The two Putzmeister placing booms were originally standard MXR 34/38Z units modified by shortening the boom length to 30 meters to make up for the weight difference in using the six-inch pipe required.

Instead of typical five-inch pipe, six-inch was needed throughout the delivery system in handling the extremely harsh concrete mix supplied by the on-site batch plant. The brutal mix comprises crushed granite at one and one-half inches wide yet an inconceivable four inches long.

Due to the abrasive mix, high pressures, and up to 500 ft. (150m) pumping distances involved, Putzmeister ZX pipes and couplings are also being used.

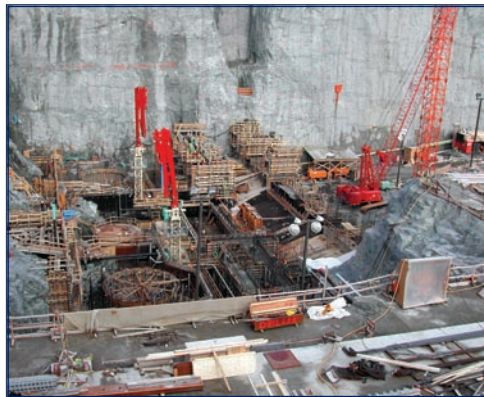
Ken noted, "We needed heavy-duty pipe and couplings for handling the extremely hard aggregate mix and for long usage life. Putzmeister's special ZX pipe and couplings are completely leakproof and high pressure resistant. They definitely outlast any standard pipe and are an absolute necessity for this application."

Two Putzmeister BSA 2109 H-D trailer-mounted concrete pumps were also selected because of their field proven S-Valve for handling the coarse mix.

They would also help keep wear costs to a minimum with their inherently long 83-inch (2,100mm) stroke cylinders and up to 2205-psi (152 bar) high pressure capabilities.

Without a set pattern, pumping occurs on an irregular basis. Average outputs range between 25 to 80 cu. yds. an hour (20 to 60m³/hr) – with the rate of placement governed by the specifications and the complexity of the intricate forms, not by the equipment capabilities.

Of the two trailer pumps, one serves as the main production unit being fed via a Putzmeister JT-5000 jumbo trough – a surge hopper directly flanged to the pump's hopper. The jumbo trough allows a quick and full discharge of the mixer trucks into its large capacity hopper, which in turn allows concrete to be fed to the pump at any speed needed from 0 to 125 cu. yds. an hour (0 to 95m³/hr).



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The second Putzmeister trailer pump serves as backup because cold joints are absolutely forbidden or the powerhouse would be structurally deficient. Consequently, in case of an equipment malfunction, the second pump can finish a pour.

Ken said, "We basically have to almost duplicate equipment needs because of our remote location 15 hours away from Montreal. With 600 men on a job, we can't afford down time. Fortunately, no major problems have resulted to date, and the equipment has performed to our demanding expectations."

From April to November 2004, concrete work for the powerhouse took place. Two 75 ft. (24m) tall placing boom towers were anchored with bolts and had to be precisely mounted in specified locations so no cold joints would interfere with the flow of water upon project completion.

The two placing booms – each using their full 100 ft. (30m) horizontal reach – first provided full coverage to place concrete for both the walls of the huge turbines and the powerhouse structure itself.

In November, the two towers were moved to handle the intake structure. This time, they were supported by 15 ft. by 15 ft. by 4 ft. high (4.5m x 4.5m x 1.2m high) poured concrete mats, and the placing booms still provided ample reach to all concrete placing areas.

Especially noteworthy is the placing boom's Multi-Z boom configuration, which proved exceptionally maneuverable in working under the low roof of a temporary overhead steel structure. The structure was specially built so construction could continue during the frigid winter months.

Aecon Hochtief is also handling the horizontal concrete work for the penstocks. The three enormous penstocks are concrete-lined conduits excavated in the rock to channel water from the reservoir to the powerhouse turbines and are designed to maximize the head (drop in level). A Putzmeister BSA 2109 H-D trailer pump is pumping the concrete lining of these 350 ft. (107m) long penstocks, each at a 25 ft. (7.6m) diameter ranging from a 12-inch (305mm) to 4 ft. (1.2m) thickness.



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Besides the equipment's proven performance, service and support capabilities were a significant factor in Aecon Hochtief selecting Pompacktion for their equipment needs. Pompacktion assisted in specifying the appropriate equipment, helped train operators, and is making service calls when deemed necessary.

And making service calls isn't easy. As a closed site, entry is by invitation only via SEBJ (Air Creebec) aircraft or a 15 hour drive from Montreal. That's why a specially developed work camp was built to house construction site workers, who in staggering shifts work 42 days followed by a ten day leave.

During a peak period last summer, nearly 2,400 workers were housed in dormitories. Similar to a small town, the site offers a variety of services such as cafeteria, hair salon, convenience store, post office and library along with indoor and outdoor recreational facilities. Once the project is complete, the approximate one-half square mile work camp will be dismantled and transported to another job site.

Besides building the concrete intensive powerhouse, other construction projects on site are also utilizing various Putzmeister models, resulting in a monopoly of Putzmeister equipment on Eastmain-1. This includes a BSA 1409 electric-powered trailer pump being used by Norascon-Hebert, a joint venture between two established businesses in Quebec. The unit is competently placing concrete for all incline work associated with the penstocks.

In addition, a Telebelt® TB 105 belt conveyor was utilized for placing concrete on the main dam across the Eastmain River. The contractor, Hamel Construction of Québec City took full advantage of the conveyor's special functionality to place unusually tough mixes and other aggregates such as sand, gravel and rock with ease.

For construction of the numerous dams, various Thom-Katt® trailer-mounted pump models were utilized for shotcreting by Norascon-Hebert and also by EDM Construction of Québec City, who were subcontracted by CCDC in Montreal. In addition, a Putzmeister SP-11 diesel-powered rotor/stator pump handled injection grouting for EBC, Inc. of Québec City.

Even the PWT high pressure washers – the latest addition to the Putzmeister America product line – were on-site working six months for Neilson Construction of Québec City. Next to the dam, two 500th models sprayed water at high 7,500 psi (520 bar) pressures to thoroughly clean selective areas of rock before concrete placement was possible.

In summary, Francis Gagnier, Vice President at Pompacktion said, "We've sold several different pieces of Putzmeister equipment to various contractors working on this enormous and demanding project complex. That alone is valid testimony to the value placed on the equipment's performance and reliability within such a remote location." Plans are for the facility to be operational by late 2006.

CONTRACTOR SPECS

Concrete placing equipment dealer

*Pompacktion, Inc.
Pointe-Claire (Montreal), Canada*

General contractor for powerhouse and water intake structure

Aecon Hochtief

General contractor for penstocks

Norascon-Hebert – Québec, Canada

General contractor for Eastmain dam

EBC Inc.- Québec City, Canada

General contractor for spillway

Hamel Construction – Québec City, Canada

General contractor for dikes - reservoir closure

Neilson Construction

EBC Inc.

CCDC (EDM Construction)

Fernand Gilbert Excavation

PUTZMEISTER EQUIPMENT

- BSA 2109 H-D trailer pumps (2)
- JT 5000 jumbo trough mixer
- PM towers (2)
- MXR 30Z-150 separate placing booms (2)
- Putzmeister ZX pipe and couplings
- BSA 1409 E trailer pump
- Telebelt® TB 105 belt conveyor
- SP-11 rotor/stator pump
- Thom-Katt® trailer-mounted pumps
- PWT 500th high pressure washers (2)
- Putzmeister ballasted base