

Highway & Airport
Paving Equipment

Concrete Batching
& Mixing Plants

Canal Construction
Equipment

Trenching
Equipment



CDBI

Compact Dowel Bar Inserter



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AUTOMATIC DOWEL BAR INSERTION (DBI) PROCESS



G&Z's patented mechanical Dowel Bar Inserter attachment accurately inserts dowels in plastic concrete behind the slipform paver confining pan. G&Z's unique combination of DBI confining pan, trailing sideforms and vibrating insertion forks help insure good consolidation and homogeneous concrete around the inserted dowel bars. This is accomplished while minimizing the disturbance to the surrounding concrete surface.



STEP 1

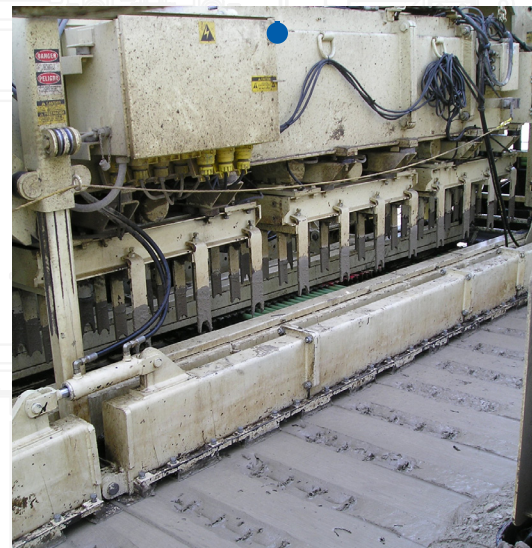
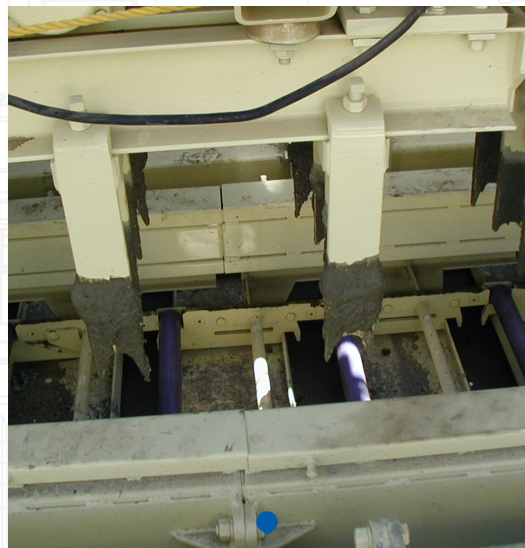
Dowel bars are manually loaded into the patented dowel distributing chain feeder system one bar at a time. Dowels can be fed from either side of the machine.

STEP 2

When the dowel distributor is fully loaded, the dowels are rapidly distributed across the DBI confining pan by the chain feeder. The rolling dowels drop into any open magazine holding slot in the dowel distributor track above the plastic concrete to await insertion. Once an open magazine slot is filled, the following dowels roll over the top of the dowel to the next open slot.

STEP 4

The roller supported inserter beam and confining pan (which floats on the concrete surface located immediately behind the slipform paver pan) are towed by hydraulic cylinders attached to the paving kit. The roller supported DBI inserter beam with confining pan stays stationary in reference to the joint during the insertion process allowing the paver to continue to advance.



STEP 3

At the start of the insertion cycle, the distributor track, magazine slots shift allowing the dowels to drop from the holding slot through the confining pan guides to the top of the plastic concrete where they await insertion by the vibrating forks. Guide "fingers" hold the dowel sitting on top of the plastic concrete in the proper position prior to insertion.

— 20 1/8 [511mm]

17 3/4 [450mm]

8' [2.4M]

— 26 9/16 [675mm]

21 1/8 [536mm]

11'-11 11/16" [3.6M]

SELF-LOADING D.B.I.

SELF-LOADING JACKS, SUPPORTS AND POWER UNIT OPTIONAL

SHIPPING D.B.I.

NOTE: BY REMOVING REAR LOAD AND TRAILING FINISHING, TRANSPORT WIDTH REDUCED UNDER 3.5M WIDE.



NEW DOHA INT'L AIRPORT

**SGW (JV)
QATAR**

Project:
6 m (19'-7 1/5") wide with a 6 m (19'-7 1/5") standard grid with a typical thickness of 400 mm to 445 mm (15 3/4" to 17 1/2"). The majority of the aprons are both transverse and longitudinal doweled. G&Z's Compact Dowel Bar Inserter (CDBI) was used to insert the transverse bars on 380 mm (15") centers and 443 mm (17") centers. 375,000 dowel bars on the project.

Equipment:
S850, CDBI



PRIVATE ACCESS ROAD

**MOLS
VANDECASTEELE, BELGIUM**

Project:
8 m (26'-0") wide / 20 cm (7 9/10") thick access road. Doweled transverse joints with a 25 mm (1") x 500 mm (19 7/10") dowel at 25 cm (9 4/5") centers. Longitudinal joints with tie bars of 12 mm (1/2") x 750 mm (30"). One curve with inner radius of 40 m (131'-0") followed by second curve of 50 m (164'-0"). Final 100 m (328'-0") had grade of 8.78%. Total paving length of 540 m (1,772'-0").

Equipment:
S850, CDBI



NATIONAL HIGHWAYS

**KNR
ASSAM REGION, INDIA**

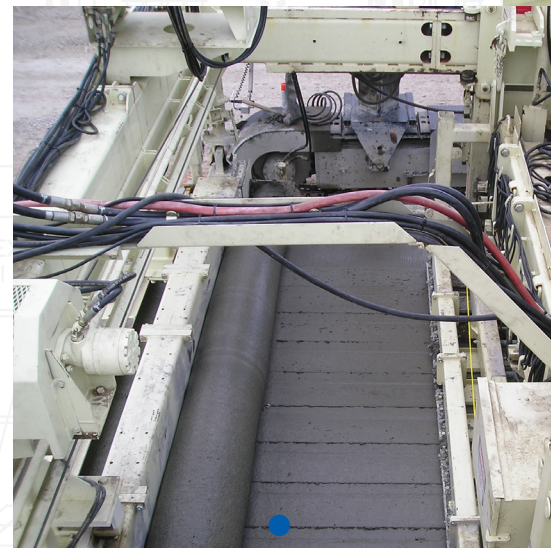
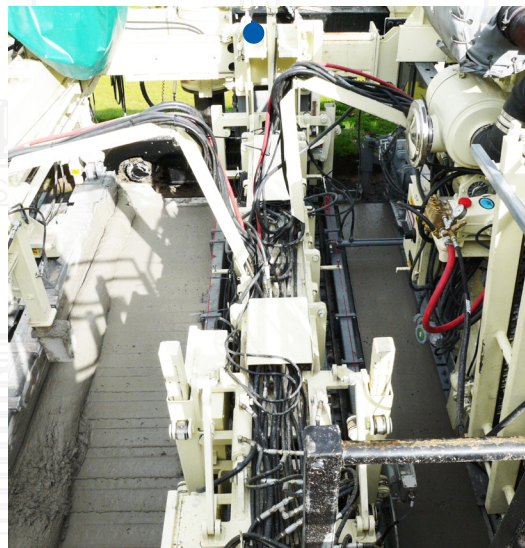
Project:
Straightening and widening of 41 km (25.5 mi.) of a four-lane roadway and 16 km (10 mi.) of new concrete road construction known as the Nagan Bypass. Paved at 8.75 m (28'-8 2/5") wide and 30 cm (11.8") thick.

Equipment:
S850, CDBI

...AROUND THE WORLD

STEP 6

Once the insertion cycle is complete, the towing hydraulic cylinders retract the roller supported inserter beam and confining pan back to their resting position at the rear of the slipform paver pan; then the DBI is ready for reloading.



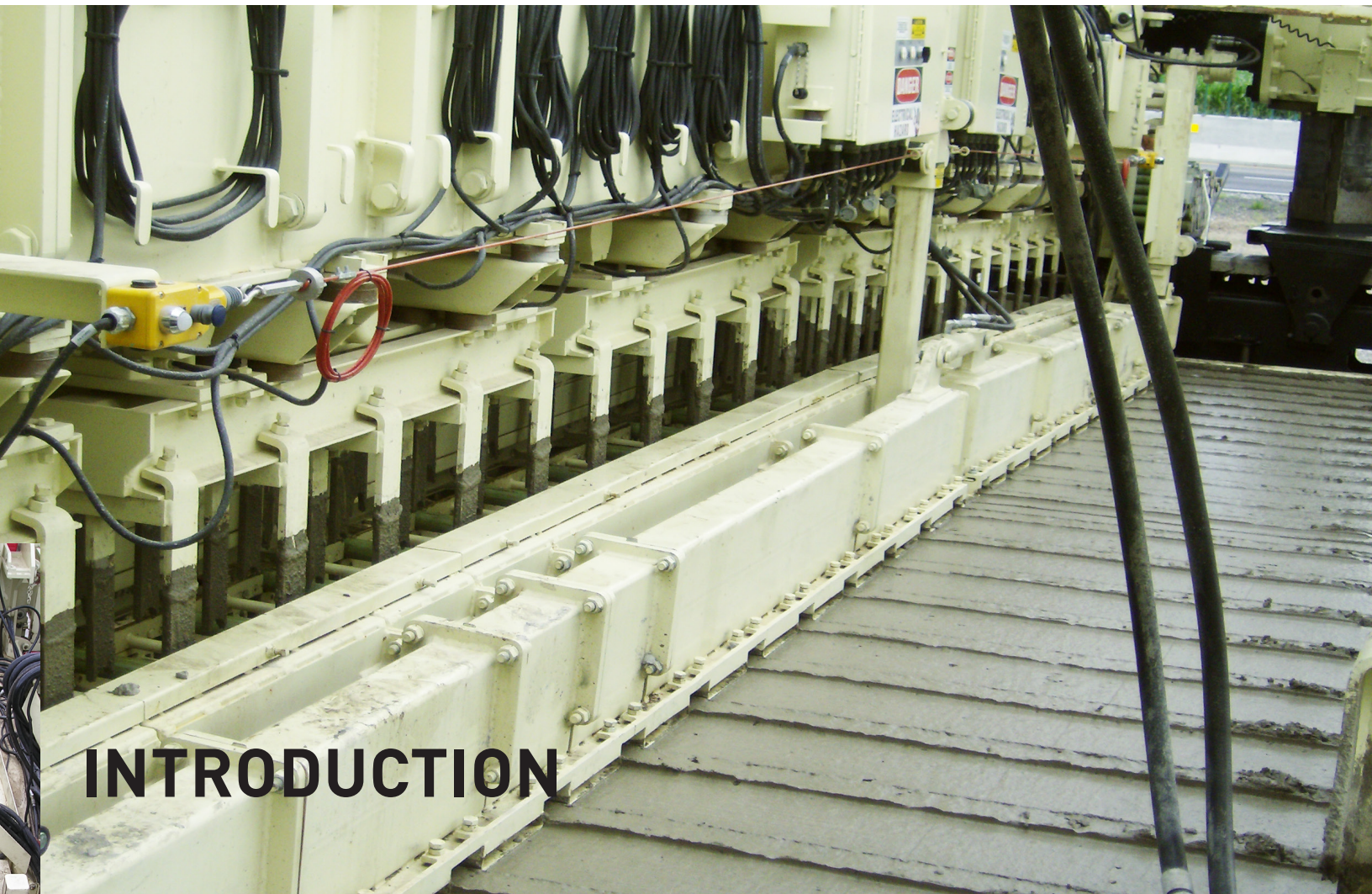
STEP 5

Dowel bars are inserted into the concrete through narrow openings in the confining pan to a preset depth with a combination of light hydraulic pressure and vibration. Precision insertion forks, vibration isolated from the inserter beam, impart intense vibration to each bar. The combination of these important features helps insure good consolidation and homogeneous concrete around the bar.

STEP 7

The following Oscillating Correcting Beam (OCB) refinishes the concrete surface blemished by the dowel insertion process with little or no additional finishing required.

Note: Control over the concrete mix design, namely optimization of the combined aggregate gradations, aggregate particle shape, concrete uniformity, and workability is, essential to achieve smooth paving results.



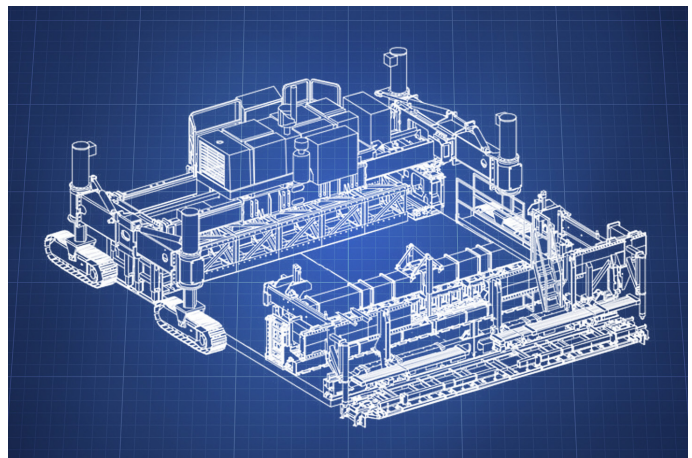
INTRODUCTION

G&Z pioneered Dowel Bar Inserter (DBI) technology starting the late 1970s. Since then, G&Z has been the leader in DBI technology by continuously improving its state of the art DBI based on extensive field experience. This leadership edge insures G&Z DBI users the highest productivity, mobility, ease of width change, reliability, user friendliness, smoothest rides and best dowel bar accuracy possible.

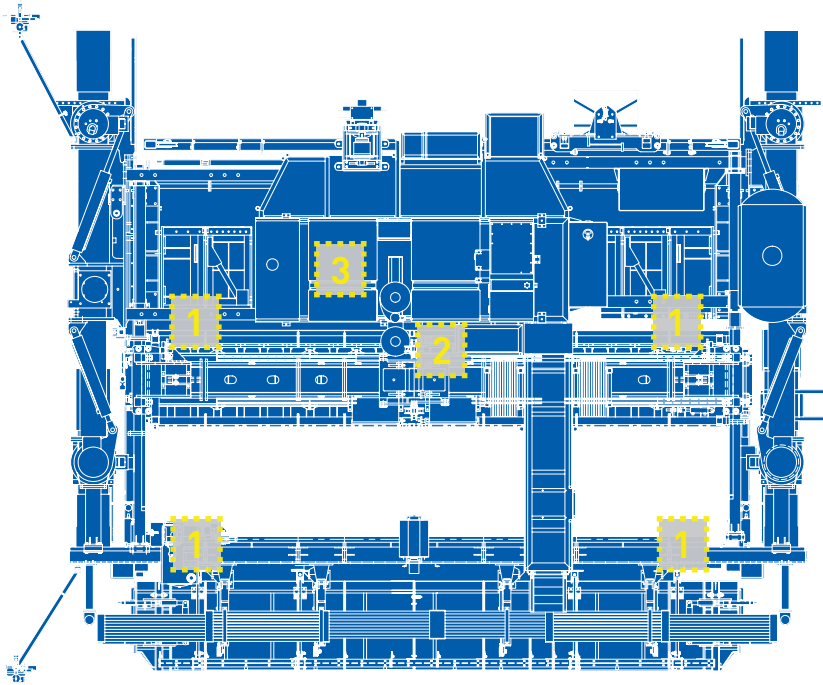
When developing G&Z's Compact Dowel Bar Inserter (CDBI), G&Z focused on making successful DBI technology even better. G&Z's goal was to make the dowel bar inserter more economical for use on smaller projects. G&Z's Compact DBI offers the following advantages and improvements:

- The patented CDBI structure is a single, self-supporting module designed to speed assembly, disassembly and width changes. The optional CDBI self-loading kit eliminates the need for a crane to add / remove the CDBI from the paver or load / unload a trailer. These tasks now take hours instead of days.

- The CDBI quickly mounts on the rear of a standard G&Z Four-Track Slipform Paver with minimal modification. This patented feature allows conversion back and forth between DBI and non-DBI paving in a matter of hours.
- The patented CDBI dowel distributing Chain Feeder System reduces the feeding system profile and greatly improves the feeding system's speed and reliability as compared to the old dowel distributing cart system.



CONNECTING THE DBI



- 1 Mechanical Bolting Connections**
- 2 Electrical and Hydraulic Connection**
- 3 With DBI Prep Kit Only Single Diesel Engine Required**

The Modular CDBI Mounts on the four track G&Z S850 Paver with QUADRA bolsters, with no modification, provided the optional DBI Preparation Kit is selected. Bolster extensions are not required on the G&Z S850 Paver in most applications. Conversion of the paver between DBI and non-DBI use can be accomplished in hours. When the CDBI is mounted on G&Z's S600 or S1500 Pavers with swing legs, bolster extensions are typically used.

The CDBI is connected to the paver with four large bolting flanges. Quick electrical and hydraulic connectors are provided in the DBI Preparation Kit at the rear of the paver power unit.

The optional DBI Preparation Kit for the paver also includes a larger diesel engine and increased pump capacity to eliminate the need for an additional pumping unit to power the DBI. When space is a premium, the G&Z paver can be equipped with a Narrow Profile Kit (NPK). The G&Z paver and CDBI equipped with the NPK can operate with as little as 12" (30 cm) of trackline.

EXCEPTIONAL ACCURACY



The G&Z CDBI was engineered and designed with one goal in mind, dowel bar insertion accuracy. Exceptional smoothness, productivity gains, and/or cost savings associated with the use of a DBI mean nothing if the dowel bars are not inserted to the accurate depth and alignment and have homogeneous concrete surrounding them. The G&Z CDBI has been proven on hundreds of projects around the world. Contractors and transportation engineers have used MIT-2 scanners to ensure the proper placement of the dowels and have proven G&Z's patented DBI to be as accurate and often more accurate than dowels set on baskets. The rigid, precision built components of the G&Z DBI ensure dowels placed with this success.



DOWEL BAR STAGING



The CDBI is equipped with a dowel bundle support rack allowing dowel bars for several joints to be staged within reach of the operator for the loading of the chain feeder.

In lieu of the standard Jib Boom with a one ton electric hoist, an optional Auto Crane can be supplied to assist the operator in picking up and pre-placing dowel bundles in the dowel bar support rack. The Auto Crane can be mounted on the bolster on either side of the slipform paver. It can also be used for loading tie bar bundles.

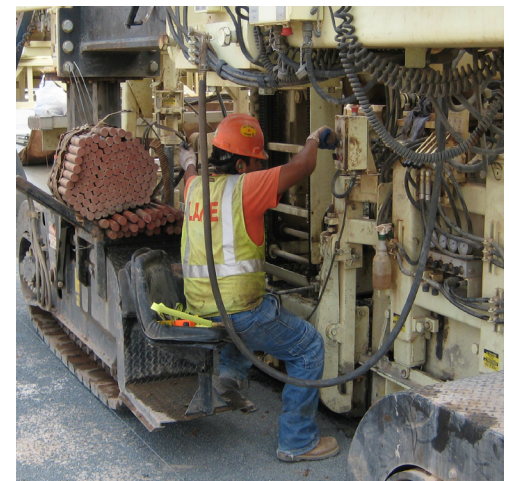
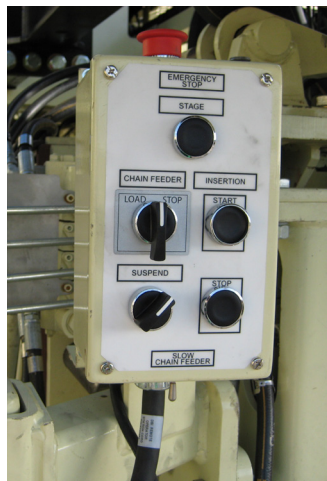


OPERATOR STATION & CONTROLS



The CDBI is equipped with an operator station with seat designed for operator comfort and visibility. From the operator seat, the operator can easily reach the chain feeder and the CDBI control box.

The CDBI comes equipped with a manual and automatic remote control box for the CDBI operator. The remote control box is used to advance the chain feeder across the inserter, stage the inserter beam, and if applicable, manually insert the dowels. The operator control box is also equipped with an emergency stop button.

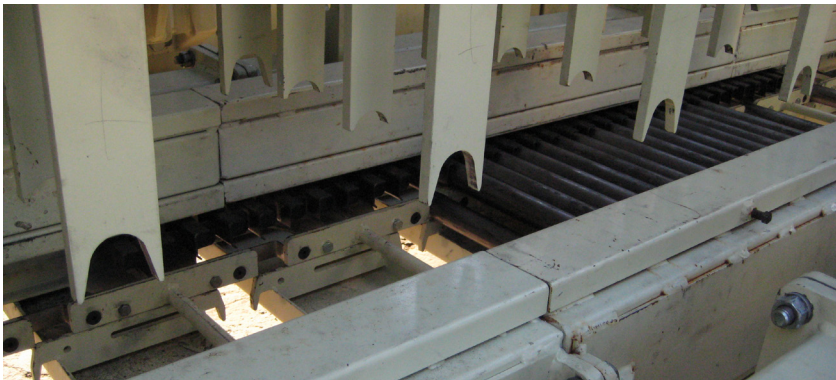


CHAIN FEEDER



The patented CDBI dowel distributing Chain Feeder System reduces the dowel distributing system profile and greatly improves the feeding system's speed and reliability as compared to the old dowel distributing cart system. The standard Chain Feeder System features cups that hold the bars vertically in the feeder until the bars are sent across the DBI confining pan. For high speed / high production paving operations, the Rapid Dowel Bar Feeder (patented) allows the paving operation to run at very high forward paving speeds.

LANE SPACER PANS & INSERTION FORKS



Precision insertion forks and magazine guides help ensure consistently high dowel bar location accuracy. As an option, the DBI insertion racks can be supplied with four forks per bar with two different vibration frequency (3000 vpm for outer forks and 6000 vpm for inner forks). Providing four forks per bar offers superior vibration along the bar length when less than perfect concrete is encountered to ensure homogeneous concrete surrounds the bar and good hole closure above the bar even at high production paving speeds. The CDBI can be easily and economically rearranged for different dowel centers, dowel lengths, diameters and depth.

OSCILLATING CORRECTING BEAM



The Oscillating Correcting Beam (OCB) is a mechanical finishing device required behind the DBI to refine the concrete surface after dowel insertion. The precision built OCB includes bolt-on and replaceable wear plates on the bottom and leading edge as well as edge overbuild capability.

The optional OCB Spreader Plow redistributes concrete in front of the OCB and is used for moving concrete uphill in super elevated curves. The plow is used periodically for mixing up the concrete roll as well.



GUILLOTINE SIDEFORMS



The Guillotine Trailing Sideforms with hydraulic open close capability allow for quick morning starts backing up over the previously poured slab reducing hand work at the headers, ease of cleaning, and reduce concrete losses due to leakage under the sideforms when less than perfect subgrade is encountered. The front part of the Guillotine Trailing Sideforms hydraulically open with the paver's paving kit sideforms. The rear of Guillotine Trailing Sideforms are provided with a powerful hydraulic open and close cylinders in lieu of a manual mechanical arrangement that is slow and requires special night headers to be made.



CDBI TRANSPORTATION / MANUEVERABILITY

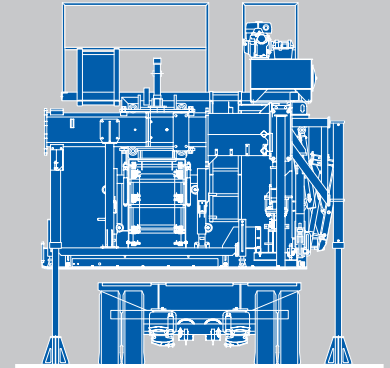


With the optional 90 degree steering and counter-rotation capability available on all G&Z four track slipform pavers, a G&Z paver with CDBI can walk and steer sideways through tight confines including bridge columns or other obstacle found on job sites.





SELF LOADING KIT



The CDBI ships as a separate, self-supporting, module consisting of DBI Inserter Beam, Oscillating Correcting Beam (OCB), rear cross beam with walkway with the optional TFP folded up for transport.

The patented modular design structure speeds assembly, disassembly and width changes. The optional CDBI Self-Loading Kit consisting of four hydraulic out riggers and a small gas engine pumping unit eliminates the need for a large crane to add/remove the CDBI from the paver or load / unload trailer as well as the time needed to change widths. These tasks now take a few hours instead of days.

The CDBI can be quickly mounted and dismantled off the rear of a standard G&Z Four-Track Slipform Paver and allows conversion back and forth between DBI and non-DBI paving in a matter of hours.



CDBI APPLICATIONS...



DULLES INT'L AIRPORT

THE LANE CONSTRUCTION COMPANY
DULLES, VIRGINIA, U.S.A

Project:

Includes one new major runway, connecting taxiways, and deicing pad, consisting of approximately 280,000 cubic yards (214,077 cubic meters) of concrete. Paved at 18'-9" (5.7 m) wide and 17" (43 cm) thick.

Equipment:

S850, CDBI



NEW YORK THRUWAY

COLD SPRING CONSTRUCTION
NEW YORK, U.S.A.

Project:

15 mi. (24.14 km) of toll road construction. 26'-0" (7.9 m) wide and 13" (33 cm) thick. The concrete pavement section is supported by a 4" (10 cm) layer of permeable concrete base over a 12" (30 cm) sub-base layer of recycled concrete. Transverse joints are spaced every 14'-9" (4.5 m) using 1-5/8" x 18" dowel bars.

Equipment:

7 S850, CDBI



HIGHWAY 4

R&L BROSAMER, INC.
ANTIOCH, CALIFORNIA, U.S.A.

Project:

24'-0" (7.3 m) wide and 12" (304.8 mm) thick concrete pavement.

Equipment:

S850, CDBI

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