PNA™
CONSTRUCTION TECHNOLOGIES

FULL LINE CATALOG

Trusted Manufacturer of Concrete Flatwork Solutions

Since 1987, PNA Construction Technologies has been a trusted manufacturer of flatwork solutions. Our products can be found in many high demand slabs and pavements, from cold storage and warehouses to automotive manufacturing and airport hangars. PNA combines industry leading products and design services to deliver results for owners, contractors, and everyone in between. Across the United States and Canada, our experienced sales and engineering teams are ready to support your next project.

Collaborate

Our in-house flatwork engineers use proprietary engineering tools to help owners, architects, and engineers optimize flatwork performance and reliability. PNA offers customized design proposals and other engineering support, including construction details, drawings,and master specifications.

Learn

Our Submittal Library contains product literature, drawings, installation guides, and specification documents.

Locate

Interested in our products for your next project? Find a distributor or contact your local Territory Manager. For Customer Service and general inquiries, call 800-542-0214.

Manufactured in the U.S.A

With a plant on both coasts (Charlotte, NC and Bakersfield, CA), PNA is a short distance to your next jobsite.

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Design Optimization

Our in-house design team at PNA uses proprietary engineering tools to optimize flatwork performance and reliability. For over a decade, we have customized designs for all site conditions, performance targets, and customer preferences. We can work on new projects without existing specifications or analyze current design specifications to determine if they are over or under engineered based on facility and customer needs. Our advanced engineering technology and expert analysis optimize flatwork performance and total cost of ownership. These services are available for commercial and industrial facility specifiers.

LOADING

Racking and material handling equipment (MHE) information ensures best results specific to the project.

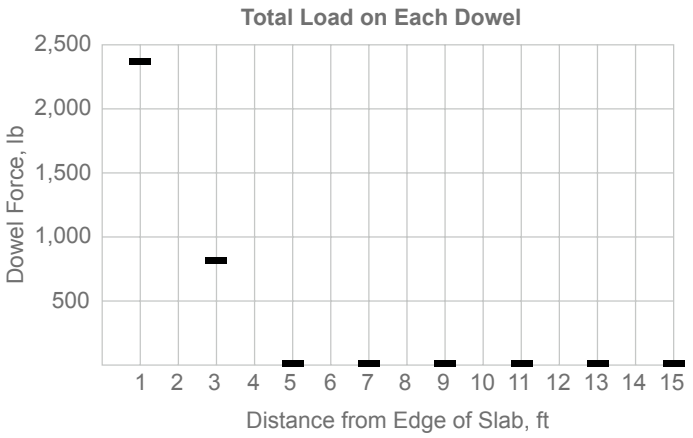
INITIAL SLAB DESIGN

Project plans, specifications, and all available information are utilized to ensure optimization success.

CONCRETE MATERIAL AND SLAB LAYOUT

Concrete compressive strength, joint spacing, slab thickness, and other elements are taken into consideration.

Response Criteria	Limit	Design	Factor of Safety
Joint Differential Deflection, in.	0.0200	0.0093	2.15
Dowel Flexural Stress, psi.	36,000	16,960	2.12
Dowel Shear Stress, psi.	20,785	3,679	5.65
Concrete Bearing Stress, psi.	7,093	3,835	1.85
Concrete Shear Cone Capacity, lb.	4,200	2,355	1.78



Submit Optimization Request

340,000 sq.ft. Warehouse Facility Southeast, US

Original Specification

15’x15’ panels, 8” depth using 1.25” Round Dowel @ 12” OC

PNA Optimized Solution

PD3 Dowel Basket: 3/8” @ 18” OC

24% Reinforcement Material Savings

625,000 sq.ft. Distribution Center Canada

Original Specification

17.5’x17.5’ panels, 7” depth using 3/8” @ 18” OC PD3 Dowel Basket

PNA Optimized Solution

PD3 Dowel Basket: 3/8” @ 26” OC

24% Reinforcement Material Savings

400,000 sq.ft. Warehouse Facility Northeast, US

Original Specification

12’x12’ panels, 7” depth using 1/2” @ 18” OC Plate Dowel Basket

PNA Optimized Solution

PD3 Dowel Basket: 3/8” @ 18” OC

10% Reinforcement Material Savings

Distribution Center | Southwest Canada

The Challenge

A project engineer was tasked with reducing material costs, leading to a request for PNA to evaluate the feasibility of decreasing the slab thickness of a Distribution Center from 12 inches to 10 inches. This reduction required a thorough assessment of the slab’s performance, particularly concerning the load transfer capacity at the joints. To address this, the project engineer sought PNA’s expertise to determine whether the proposed reduction could be achieved without compromising slab-on-grade (SOG) integrity.

Engineering Analysis

PNA conducted an in-depth analysis to evaluate the slab capacity at the joints. Our engineers examined the performance of a 3/4” @ 12” OC PD3 Dowel Basket in both 10-inch and 12-inch slab scenarios. The outcomes revealed that while the 12-inch slab exhibited a satisfactory factor of safety (FOS), ensuring robust load-bearing capacity, the 10-inch slab fell significantly short, posing a considerable risk of failure under anticipated loads.

Our Solution

Recognizing the risk associated with the 10-inch slab, our engineers proposed an innovative solution: exploring an 11-inch slab option combined with an increase in concrete strength from 3600 psi to 4000 psi. This strategic adjustment yielded a 38% improvement in the FOS, effectively addressing performance concerns. Through design optimization, PNA provided a viable solution that balanced the need for reduced slab thickness with maintaining the facility’s integrity and the service life of the SOG. The successful implementation of PNA’s solution demonstrated the value of expert intervention in complex projects and ensured the facility’s reliability. Additionally, cost savings of over 8% were achieved through the reduction in concrete material, yielding significant dollar savings.

Strategic Reinforcement

The Strategic Reinforcement design is a cost-effective solution for interior and exterior concrete flatwork exposed to wheeled traffic. Commonly adopted by facility owners worldwide, this design optimizes material use and minimizes joint spalling and random cracking. It achieves this by removing steel from the mid-panel and strategically placing PNA tapered plate dowels at the joints where reinforcement and load transfer are most needed.

Concrete flatwork, whether slabs on grade or paving, serves as the working platform for businesses in distribution, warehousing, logistics, food, retail, and manufacturing facilities. The performance and functionality of these businesses heavily rely on the serviceability and durability of the concrete flooring. By effectively managing the behavior of concrete, the Strategic Reinforcement Design ensures long-term durability. It mitigates internal and external restraint and stress, optimizing load-carrying capacity of the concrete while delivering the joint stability required by advanced material handling equipment (MHE) and wheeled traffic. The Strategic Reinforcement design approach achieves high performance with the minimum quantity of materials required for the function of concrete flatwork.

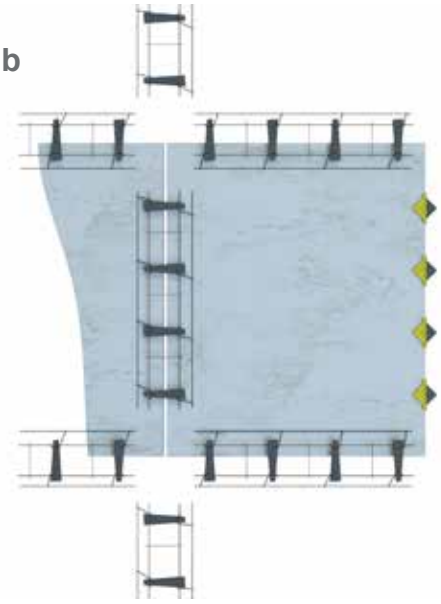
PNA Products for Strategic Reinforcement

- PD3 Basket Assembly
- Diamond Dowel System
- Square Dowels
- Optimization Calculator

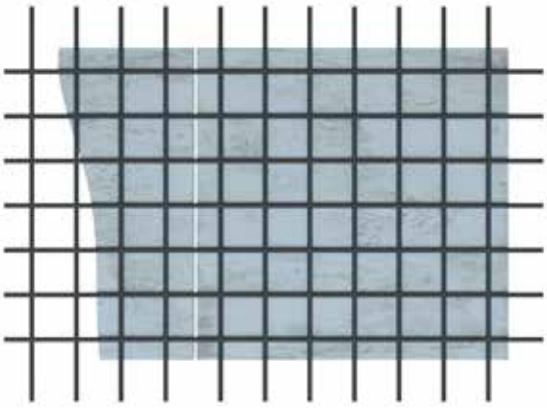
Benefits

- Reduces labor costs
- Manages the effect of curling
- Provides positive load transfer at the joints
- Easy installation during placement

PNA Slab



Rebar Slab

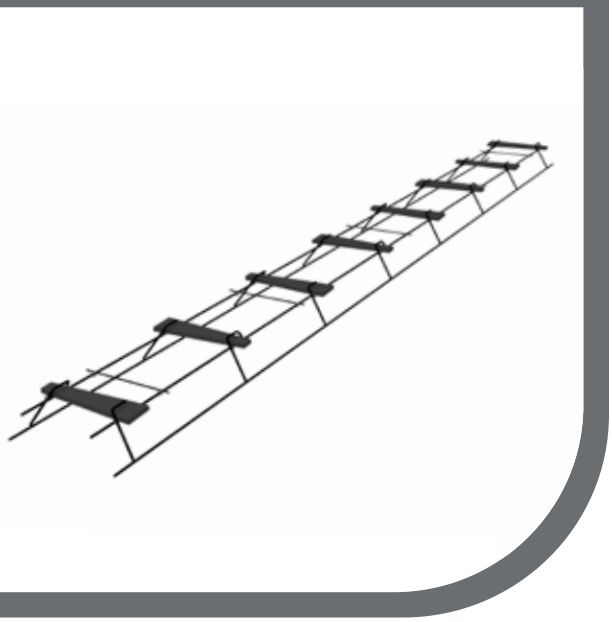


PD3 Basket® Assembly

The PD3 Basket Assembly offers an unparalleled design that ensures optimal performance by facilitating effective load transfer at the joints. Its patented tapered geometry controls deflection, providing a smoother transition across the slab. Further, the wedge-like shape allows for lateral movement. The fully welded basket assembly features an alternating dowel configuration to ensure high performance at construction tolerance extremes including misalignment between the basket and the saw cut.

Industry Benefits

- Improves load transfer efficiency
- Reduces the amount of steel used
- Lowers the risk of spalling
- Allows for two-way lateral movement
- Maintains high performance at tolerance extremes
- Maximizes factor of safety
- Minimizes maintenance and downtime costs



Common Configurations

Part No.	Slab Height	Dowel Thickness	On-Center Spacing
BPD381218085060	5-6”	3/8”	18
BPD381224065060	5-6”	3/8”	24
BPD381218087090	7-9”	3/8”	18
BPD501218087090	7-9”	1/2”	18
BPD501224067090	7-9”	1/2”	24
BPD751218089120	9-12”	3/4”	18
BPD751224069120	9-12”	3/4”	24

*Stainless steel and galvanized options available upon request. Additional configurations for slab heights 4”-16” available, please contact Territory Manager.

PD3 Basket Assembly meets ACI 360R-10, ACI302.1R-15.

All plates are manufactured from steel certified to meet ASTM A36 and may be possible for LEED credits.

Diamond Dowel® System

For New Construction

The Diamond Dowel System is a reliable solution for construction joints in concrete flatwork applications. The system consists of a tapered plate dowel, its corresponding pocket former, and an installation template. The dowels and pocket formers work together to provide the necessary joint stability and load transfer that projects require. The pocket former design maximizes crush resistance during curing, allowing for easier dowel insertion.

An easy-to-use installation template is included in every box of Diamond Dowel Systems to enable proper positioning while saving time on-site.

Industry Benefits

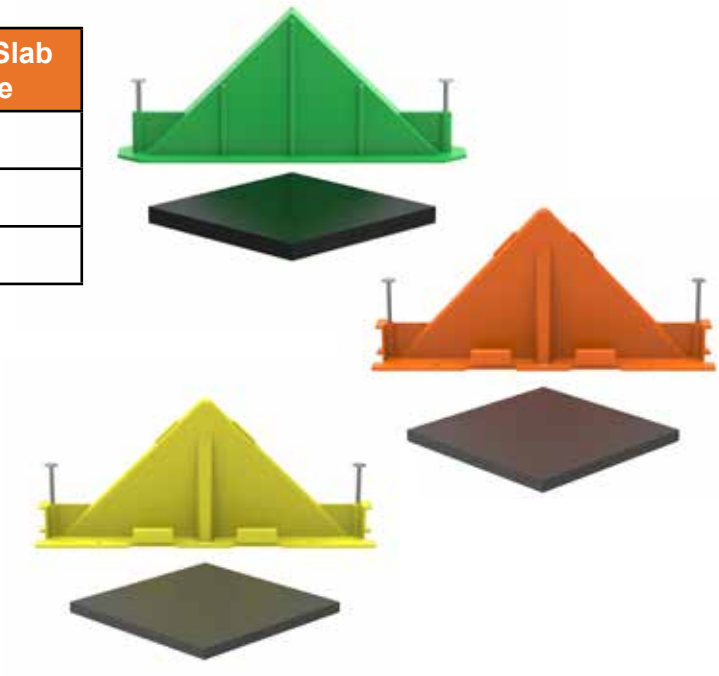
- Improves performance
- Minimizes joint spalling
- Easy and precise installation
- Elminates tripping hazards
- Reduces maintenance and downtime costs

Part No.	Color	Dowel Thickness	Typical Slab Range
DD2V250	Orange	1/4”	5”-6”
DD2V375	Yellow	3/8”	7”-8”
DD750	Green	3/4”	+9”

*Stainless steel and zinc-plated available upon request

The Diamond Dowel System meets ACI 360R-10, ACI 302.1R-15

Dowels are manufactured from steel certified to meet ASTM A36



Square Dowel System

For Expansions and Repairs

The Square Dowel System consists of square dowels and a corresponding Square Dowel Clip™. The dowels are cut and deburred per industry guidelines ensuring square, true, and smooth edges that will not induce restraint. The Square Dowel Clip features compressible foam that allows joint activation and free movement of the concrete after placement without creating restraint. Dowel Aligners are available to secure the dowels to wood formwork for new concrete projects.

Industry Benefits

- 27% greater cross sectional area of steel at the joints*
- Has a 70% higher bending resistance*
- Improves joint stability
- Reduced differential deflection
- Eliminates greasing and spinning dowels

* Compared to round dowels

Square Dowels

Round Dowels

Compared to round dowels, square dowels ensure a consistent and increased bearing area of steel at the joint to deliver load transfer.

Part No.	Dowel Thickness	Dowel Length	Clip Length	Typical Slab Range	Dowel Aligner
SD500	1/2”	9”	5”	≤ 6”	DA500 & DA750
SD750	3/4”	10”	5 1/2”	5”-6”	DA750
SD1000	1”	13”	7”	6”-8”	DA1000
SD1250	1 1/4”	15”	8”	≥ 8”	–

Square Dowel Baskets for 4” slabs are available.

The Square Dowel System meets ACI 360R-10, ACI 302.1R-15. Square Dowels are manufactured from steel certified to meet ASTM A36.

Armor-Edge®

Joint Assembly

The Armor-Edge Joint Assemblies are the ideal edge protection solutions for high-traffic areas, cold storage buildings, and extended joint designs. Three solutions are available for new construction, expansion and repair: Armor-Edge®, Armor-Edge® All Steel Joint, and Armor-Edge® n2e. All three products offer the same superior benefits regardless of project type.

Armor-Edge now comes standard with Joint-Fill Stop, providing a smooth transition for lift trucks across construction joints. The Joint-Fill Stop eliminates steps required to fill the joint by providing shoulder support for semi-rigid joint-fillers, saving labor and material costs.

Industry Benefits

- Provides superior joint stability and protection for the most critical joints
- Offers solutions for jointless and extended joint floors
- Allows for a smooth transition between slabs
- Arrives job-site ready for quick installation
- No on-site welding necessary
- Reduces equipment maintenance costs
- Lowers the amount of call backs
- Reduces damage to joints (spalling)

Armor-Edge®
for new construction

Armor-Edge is designed to fit onto wood formwork which allows the steel edge to protect the construction joints from spalling. The joint-fill stop feature is ideal for joints that are opening wider.

Part No.	Product Length
AE3504X375X12	12 LF

*Stainless steel and galvanized options available upon request
Pairs with Diamond Dowel System for load transfer
Armor-Edge meets ACI 360R-10, ACI 302.1R-15

Armor-Edge® All Steel Joint
for new construction

Armor-Edge All Steel Joint includes a leave-in-place form complete with the PNA Diamond Dowel System, reducing on-site labor hours.

Part No.	Slab Height	Dowel Thickness	O/C Spacing
ASJ250X18X12X6	6”	1/4”	18”
ASJ375X18X12X7	7”	3/8”	18”
ASJ375X18X12X8	8”	3/8”	18”

*Stainless steel and galvanized options available upon request
Additional configurations available, please contact Territory Manager
Armor-Edge meets ACI 360R-10, ACI 302.1R-15

Armor-Edge® n2e
for new-to-existing construction

Armor-Edge n2e is designed for edge protection in new-to-existing slabs. Paired with the PNA Square Dowel System, n2e ensures smooth transitions for flatwork expansions and repairs.

Part No.	Product Length	Square Dowel System
N2E	12 LF	SD750

*Stainless steel and galvanized options available upon request
dArmor-Edge meets ACI 360R-10, ACI 302.1R-15

HydraCure™ S16

HydraCure S16 covers are made from inorganic materials and feature a two-layer design. The lower layer is a non-woven material with smooth fibers that evenly draws and distributes water across the slab surface and will not stick, disintegrate, rot, stain, or leave residue. The second layer is a white reflective film that traps moisture underneath, creating a high humidity environment. This patented design is the ideal solution for a controlled curing environment for concrete slabs-on-grade, providing optimal hydration at an affordable price.

Industry Benefits

- Ensures a gradual, uniform, and controlled curing of flatwork
- Reduces cracking, crazing, scaling, dusting, and pop-outs
- Increases concrete strength and durability
- Reduces permeability of concrete
- Improves abrasion resistance

Part No.	Surface Area	Dimensions (LxW)	Weight	Rolls per Truck
S16	4,001 SqFt	381’ x 10.5’	66 lbs	320

PNA’s HydraCure S16 is compliant with the performance requirements of ASTM C-171 and AASHTO M-171
HydraCure S16 meets ACI 360R-10, ACI 302.1R-15

Bollard Base

In warehouse, retail, and industrial environments, bollards are installed to safeguard key elements of a building. When the bollards are impacted, the flatwork is often damaged, resulting in costly repairs and downtime. With the Bollard Base, bollards can be replaced without needing to repair the concrete. The Bollard Base is installed before placing concrete, eliminating the need for core drilling or anchoring.

The Bollard Base protects what matters most by allowing the bollard to fail 3-4 inches above the weld while leaving the Bollard Base in tact. When you remove the damaged bollard, the exposed steel is ready to grind and install a new bollard. The Bollard Base can be placed in a concrete slab for future use without compromising the slab integrity.

Industry Benefits

- Allows for easy bollard installation
- Eliminates damage to concrete flatwork
- Provides finished appearance

Part No.	Slab Height	Base Diameter
BB17750X6	6”	17 3/4”
BB17750X7	7”	17 3/4”
BB17750X8	8”	17 3/4”
BB17750X9	9”	17 3/4”
BB17750X10	10”	17 3/4”

*Stainless steel and galvanized options available upon request.

Additional configurations may be available, please contact Territory Manager.

All plates are manufactured from steel certified to meet ASTM A36 and may be eligible for LEED credits

Notes

FULL LINE CATALOG

PNA™ CONSTRUCTION TECHNOLOGIES

Load Transfer • Edge Protection • Curing • Specialty

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