



SUGGESTED MASTER SPECIFICATION

PNA Square Dowel, Dowel Aligner, and Square Dowel Clip™ for New-to-Existing Construction

PART 1 - GENERAL

1.1 SUMMARY

- A. Products supplied under this section: PNA Square Dowel, Dowel Aligner, and Square Dowel Clip™ for new-to-existing construction.
- B. Related sections:
 - 1. Section 03100 - Concrete forms and accessories.
 - 2. Section 03200 - Concrete reinforcement.
 - 3. Section 03300 - Cast-in-place concrete.

1.2 REFERENCES

- A. American Concrete Institute (ACI);
 - 1. ACI 315R-18 Detailing Manual (SP-66)
 - 2. ACI 302.1R-15 Guide for Concrete Floor and Slab Construction
- B. American Society for Testing and Materials International (ASTM):
 - 1. A36 Standard Specifications for Carbon Structural Steel

1.3 SUBMITTALS

- A. Product data: Manufacturer's product data with application and installation instructions for proprietary materials and items, including but not limited to load transfer systems.
- B. Shop drawings: Indicate placement of square dowels and clips.
 - 1. Indicate cross-sectional area and length of square dowels and clips and spacing. Indicate size of dowel aligner; 1/2", 3/4" or 1".
 - 2. Comply with ACI 302.1R-15, ACI 360R-10, ACI 315R-18 (SP-66) and PNA installation guides indicating arrangement of accessories.

1.4 QUALITY ASSURANCE

- A. Pre-construction meeting:
 - 1. Convene a pre-construction meeting before installation of PNA products. Require attendance of parties affecting the work of this section, including Contractor, Engineer, and installers.
 - 2. Review installation procedures and coordinate with other work.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver square dowels, dowel aligners, and Square Dowel Clips™ in manufacturer's packaging.
- B. Deliver and handle materials to prevent damage or weakening to systems.



- C. Store in an appropriate place to avoid accumulating rust, debris, or deleterious materials on assemblies. Store off ground and under cover.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Acceptable manufacturer: PNA Construction Technologies, www.pna-inc.com; 800-542-0214.

2.2 SQUARE DOWELS AND CLIPS FOR REPAIRS AND RENOVATIONS

- A. Acceptable product: PNA Square Dowel, Dowel Aligner, and Square Dowel Clip™
- B. Material:
 - 1. Square Dowels: Full-depth sawn and deburred per industry guidelines from hot rolled steel bar certified to meet ASTM A36 to within 3/16" of specified length.
 - 2. Dowel Aligner: Manufacturer by injection molding the unit.
 - 3. Square Dowel Clips: Extruded from ABS plastic. Clip holds compressible foam on each vertical side of the dowel in place during construction to allow limited horizontal movement parallel and perpendicular to joint. Length shall be +/- 3/16" of 1/2 total dowel length.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Notify Engineer at least 72 hours prior to placing concrete dowel system to allow time for examination of accessories. Place no concrete in forms without Engineer's acceptance of concrete dowel systems.

3.2 INSTALLATION

- A. Installation of square dowel system:
 - 1. AREA OF REPAIR - Avoid partial slab removal; locate the boundaries of concrete removal at existing joints.
 - 2. CONCRETE REMOVAL - Full-depth saw cut at the existing joints. Concrete shall be removed without damaging edges of concrete at the perimeter of repair boundaries. Concrete slabs can be lifted out or removed by breaking up and cleaning out. The lift-out method is preferred when possible because it subjects minimal damage to the underlying subbase and/or subgrade.
 - 3. AREA PREPARATION - All subbase and subgrade materials that have been disturbed or that are loose should be adequately recompacted to meet the project's density and moisture requirements.
 - 4. RESTORATION OF LOAD TRANSFER - At the mid depth of the concrete, drill holes using a drill bit, 5"-5.5" deep.



Hole sizes vary:

Square Dowel Size	Hole Size
1/2" Dowel	3/4" hole
3/4" Dowel	1-1/8" hole
1" Dowel	1-3/8" hole
1 1/4" Dowel	1-3/4" hole

Vacuum the drilling dust to clean the holes. Place quick-setting, non-shrink cement grout or epoxy resin in the back of the dowel hole. Insert square dowels all the way into the drilled holes. Square dowels must be aligned at 90° to the slab face, horizontally and vertically. Prevent the anchoring material from flowing out of the drilled hole, which may require placing a grout retention disk (a thin plastic disk) over the dowel and against the slab face. Allow epoxy to cure. Install square dowel clips with the plastic covering the top of the dowel and the foam sides adjacent to the vertical faces of the bars. The plastic clip should extend the full length of the exposed portion of the dowel.

5. CONCRETE PLACEMENT, FINISH AND CURING - Follow ACI recommended practice or the same practice as approved for the existing concrete placement. Ensure that the concrete is properly consolidated, especially at the perimeter. Finishing texture shall be as close as possible to that of the adjacent concrete. For replacements spanning more than one concrete panel, re-establish the contraction joints following the original jointing layout.

3.3 PROTECTION

- A. Protect PNA Square Dowel, Dowel Aligner and Square Dowel Clip™ from displacement and from damage until concrete casting is complete.

END OF SECTION