

**ROMAN PAVING SLABS 32 14 13.16**  
Sand Set Installation on Aggregate Base



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This 3-part specification utilizes the Construction Specifications Institute (CSI) *Manual of Practice*, including *MasterFormat.*, *SectionFormat.* and *PageFormat* and is a manufacturer-specific proprietary product specification using the proprietary method of specifying applicable to project specifications and masterguide specifications. Optional text is indicated by brackets [ ]; delete optional text in final copy of specification. Specifier Notes typically precede specification text; delete notes in final copy of specification. Trade/brand names with appropriate symbols typically are used in Specifier Notes; symbols are not used in specification text. Metric conversion, where used, is soft metric conversion.

This 3-part specification specifies precast concrete paving slabs. These products are manufactured by Arto Brick Veneer Manufacturing Company. Revise section number and title below to suit project requirements, specification practices and section content. Refer to CSI *MasterFormat* for other section numbers and titles.

**PART 1 GENERAL**

**1.01 SUMMARY**

Specifier Note: Revise paragraphs below to suit project requirements.

- A. Section Includes: Concrete Paving Slabs
- B. Related Sections:
  - 1. Division 31: Excavation and Fill 31 23 00.
  - 2. Division 31: Grading 31 22 00
  - 3. Division 32: Base Courses 32 11 00
  - 4. Division 32: Curbs and Gutters 32 16 00

Specifier Note: Article below may be omitted when specifying manufacturer's proprietary products and recommended installation. Retain Reference Article when specifying products and installation by an industry reference standard. If retained, list standard(s) referenced in this section. Indicate issuing authority name, acronym, standard designation and title. Establish policy for indicating edition date of standard referenced. Conditions of the Contract or Division 01 References Section may establish the edition date of standards. This article does not require compliance with standard, but is merely a listing of references used. Article below should list only those industry standards referenced in this section.

**1.02 REFERENCES.**

- A. ASTM International:
  - 1. C33 Specification for Concrete Aggregates
  - 2. C39/C39M Test Method for Compressive Strength of Cylindrical Concrete Specimens
  - 3. C67 Test Methods for Sampling and Testing Brick and Structural Clay Tile
  - 4. C136 Method for Sieve Analysis of Fine & Coarse Aggregate
  - 5. C140 Test Methods for Sampling and Testing Concrete Masonry Units and Related Units

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6. C150 Specification for Portland Cement
7. C157/C157M Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete
8. C260 Specification for Air-Entraining Admixtures for Concrete
9. C494/C494M Specifications for Chemical Admixtures for Concrete
10. C979 Specification for Pigments for Integrally Colored Concrete
11. C1028 Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method
12. C1116/C1116M Specification for Fiber-Reinforced Concrete
13. C1353 Test Method Using the Taber Abraser for Abrasion Resistance of Dimension Stone Subjected to Foot Traffic.
14. D698 Standard Test Methods for Laboratory Compaction of Soil

B. Canadian Standards Organization (CSA)

1. A231.1 Precast Concrete Paving Slabs

1.03 SYSTEM DESCRIPTION

A. Performance Requirements:

1. Absorption (ASTM C140): Not more than 12%.
2. Compressive Strength (ASTM C140): Not less than 6000 psi.
3. Freeze Thaw Resistance (ASTM C67): Unaffected after 50 cycles.
4. Abrasion Resistance (ASTM C1353): 20 wear index.
5. Coefficient of Friction (ASTM C1028): 0.6 wet/dry
6. Flexural Load (ASTM C140): Minimum load 300 lbs.

Specifier Note: Article below includes submittal of relevant data to be furnished by Contractor before, during or after construction. Coordinate this article with Architect's and Contractor's duties and responsibilities in Conditions of the Contract and Division 01 Submittal Procedures Section.

1.04 SUBMITTALS

A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 01 Submittal Procedures Section.

B. Product Data: Submit manufacturer's product data, installation instructions, and material safety data sheets for specified products.

C. Shop Drawings: Indicate layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, and setting details.

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D. Samples: Provide selection of each paving slab to represent sizes, thicknesses, textures, and range of colors in final installation. Accepted paving slabs become standard of installation for the work.

E. Sieve Analysis: Provide report from supplier or testing laboratory to confirm bedding and joint sand gradation in accordance with ASTM C 136.

**1.05 QUALITY ASSURANCE**

Specifier Note: Paragraph below should list obligations for compliance with specific code requirements particular to this section. General statements to comply with a particular code are typically addressed in Conditions of the Contract and Division 01 Regulatory Requirements Section. Repetitive statements should be avoided.

**A. Qualifications:**

1. Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project for a minimum of 5 years.

**B. Regulatory Requirements and Approvals:** [Specify applicable requirements of regulatory agencies].

1. [Code agency name].

a. [Report or approval number].

Specifier Note: Retain paragraph below for erected assemblies (either onsite or offsite) required for review of construction, coordination of work of several sections, testing or observation of operation. Mock-ups, when accepted or approved, establish standards by which work will be judged. Coordinate below with Division 01 Quality Control (Mock-Up Requirements) Section.

**C. Mock-Ups:** Install at project site a job mock-up using acceptable products and manufacturer approved installation methods. Obtain Owner's and Architect's acceptance of finish color, texture and pattern and workmanship standard(s). Comply with Division 01 Quality Control (Mock-Up Requirements) Section.

Specifier Note: Edit paragraph below when specifying mock-up size.

1. Mock-Up Size: [Specify mock-up size].

2. Maintenance: Maintain mock-up during construction for workmanship comparison; remove and legally dispose of mock-up when no longer required.

3. Incorporation: Mock-up may be incorporated into final construction upon Owner's approval.

Specifier Note: Article below should include special and unique requirements. Coordinate article below with Division 01 Product Requirements Section.

**1.06 DELIVERY, STORAGE & HANDLING**

**A. General:** Comply with Division 01 Product Requirements Section.

**B. Ordering:** Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.

**C. Delivery:** Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

1. Coordinate delivery and paving schedule to minimize interference with normal use of buildings adjacent to paving.

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2. Deliver paving slabs to the site in steel banded, plastic banded or plastic wrapped pallets or crates capable of transfer by forklift or clamp lift.
3. Unload slabs at job site in such a manner that no damage occurs to the product.

D. Storage and Protection: Store materials in original packaging protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.

### 1.07 ENVIRONMENTAL REQUIREMENTS

- A. Do not install paving slabs during heavy rain or snow.
- B. Do not install paving slabs over frozen base materials.
- C. Do not install frozen sand or saturated sand.
- D. Do not install paving slabs on frozen or saturated sand.

Specifier Note: Retain article below if the Owner wants surplus materials.

### 1.08 EXTRA MATERIALS

- A. Extra materials: Provide \_ ft<sup>2</sup> of each size, color and surface texture of paving slab specified.

## PART 2 PRODUCTS

Specifier Note: Retain article below for proprietary method specification. Add product attributes, performance characteristics, material standards and descriptions as applicable. Use of such phrases as "or equal" or "or approved equal" or similar phrases may cause ambiguity in specifications. Such phrases require verification (procedural, legal and regulatory) and assignment of responsibility for determining "or equal" products.

### 2.01 PAVING SLABS

Specifier Note: Paragraph below is an addition to CSI *SectionFormat* and a supplement to 3-part specification. Retain or delete paragraph below per project requirements and specifier's practice.

- A. Manufacturer: Arto Manufacturing Company.

1. Contact: 15209 S. Broadway St., Gardena, CA 90248-1823; Telephone: (310) 768-8500; Fax: (310) 768-8544; website: [www.artobrick.com](http://www.artobrick.com).

Specifier Note: Edit Paragraph below to suit project requirements. If substitutions are permitted, edit text below. Add text to refer to Division 01 Project Requirements (Product Substitutions Procedures) Section.

- B. Substitutions: No substitutions permitted.

Specifier Note: Paragraphs below list proprietary products offered by Arto Brick California Pavers. All measurements are nominal; consult manufacturer regarding exact measurements and product options. Select product characteristics required; delete characteristics not required.

### 2.02 UNITS

- A. Roman Paving Slabs
- B. Size
  1. 6" x 6" x 2"
  2. 6" x 12" x 2"

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3. 8" x 8" x 2"
4. 8" x 12" x 2"
5. 10" x 12" x 2"
6. 12" x 12" x 2"
7. 12" x 18" x 2"
8. 12" x 24" x 2"
9. 16" x 16" x 2"
10. 16" x 24" x 2"
11. 18" x 18" x 2"
12. 18" x 24" x 2"
13. 24" x 24" x 2"
14. 36" x 36" x 3"

Specifier Note: Select color(s) below. If more than one color is selected, create color designators and coordinate with drawings.

### C. Colors

1. Antik Gray
2. Artillo
3. Artillo Café
4. Beachwood Flash
5. Buff
6. Café Olay
7. Cauqi
8. Charcoal
9. Charley Brown
10. Chicago
11. City Hall Red
12. Cotto Dark
13. Cotto Gold
14. Desert
15. Early Gray

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16. Flagstone
17. Gold
18. Grey Myst
19. Hacienda
20. Hacienda Flash
21. Hancock
22. Jose Gray
23. Lopez Brown
24. Mission Red
25. Natural Gray
26. Ocean Green
27. Old California
28. Plumish
29. Red Flash
30. Rosa
31. Rosa White Wash
32. Sangria
33. Sidewalk Gray
34. Smoke
35. Sonora Sunset
36. Tuscan Mustard

Specifier Note: Refer to Arto color chart to view color options. Request samples from Arto or distributor to approve color variation.

D. Surface Textures

1. Standard
2. Limestone
3. Luna
4. Travertine
5. Vintage
6. Acid Wash
7. Sand Blast



## 2.03 ACCESSORIES

### A. Trim Pieces:

Specifier Note: Select series and size below. Refer to catalog or tear sheets for available accessories.

#### 1. Style/Size

- a. Roman Pool & Step Coping Style 1
- b. Roman Pool & Step Coping Style 2
- c. Artillo Coping
- d. Big Line Pool Coping
- e. Medium Line Pool Coping
- f. Modern Line Pool Coping

Specifier Note: If color(s) are not to match, insert required color(s).

#### 2. Color: [Match paving slabs].

## 2.04 BEDDING SAND

- A. Bedding sand shall conform to grading requirement of ASTM C 33.
- B. Do not use mason's sand or sand conforming to ASTM C 144.
- C. Utilize hardest sand that is practically available in areas subject to heavy vehicular traffic.

## 2.05 JOINT SAND

- A. Joint sand shall conform to grading requirement of ASTM C 144.
- B. Coarser material including sand conforming to ASTM C 33 grading requirement can be used. Additional sweeping and extra compaction will be required.

## PART 3 EXECUTION

Specifier Note: Paragraph below is an addition to CSI *SectionFormat* and a supplement to this three-part specification. Retain or delete paragraph below per project requirements and specifier's practice.

### 3.01 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions and product carton instructions for installation.

### 3.02 EXAMINATION

- A. Site Verification of Conditions: Verify that substrate conditions, which have been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.

### 3.03 PREPARATION

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- A. Verify that subgrade preparation, compacted density, and elevation are properly prepared to general contractor's specifications.
- B. Aggregate base should be compacted to a minimum 98% Proctor Density in accordance with ASTM D 698 for pedestrian areas and residential driveways.
- C. Verify that base surface tolerance is +/- 3/8" over 10 feet
- D. Verify geotextile fabric has been placed according to specifications
- E. Verify location and elevations of utility collars, drainage channels, and other infrastructure

### 3.04 INSTALLATION

- A. Spread bedding sand and screed to nominal 1" thickness.
- B. Compact screeded bedding sand with at least two passes of vibratory plate compactor with compaction force greater than 4,000 lbs. and frequency 75-90 Mhz
- C. Do not screed area larger than can be covered with paving slabs in one day.
- D. Do not use bedding sand to fill depressions in concrete slabs.
- E. Lay paving slabs by hand following patterns specified in drawings. Use rubber mallet to gently adjust horizontal alignment of pavers.
- F. Provide 1/4" – 3/8" joints between paving slabs or as specified by architect.
- G. Use cut paving slabs to fill gaps at the perimeter of the installation. Wherever possible adjust perimeter edge or bond pattern to minimize cutting.
- H. Protect paving slabs from vehicles and heavy equipment until initial compaction.
- I. Compact pavers with vibratory plate compactor with compaction force greater than 4,000 lbs. and frequency 75-90 Mhz. During compaction sweep dry joint sand into joints until full. Multiple passes will be required. Do not compact pavers within 6 feet of any unrestrained edge.
- J. Remove cracked or damaged paving slabs after compaction and replace with new paving slabs.
- K. Cover unfinished installation and materials at end of each day.
- L. Sweep and remove sand from finished installation. Sand may be left on the surface to protect paving slabs from subsequent construction

### 3.05 QUALITY CONTROL

- A. Surface tolerance from grade elevation shall not deviate more than 3/8" per 10 feet.
- B. Verify surface elevations conform to drawings and specifications.
- C. Surface elevation of paving slabs should be 1/4" above utility collars, drainage channels, and other infrastructure.
- D. Protect installed products until completion of project.
- E. Repair or replace damaged products prior to Substantial Completion

### 3.06 JOINT STABILIZING SAND



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- A. If specified, apply joint stabilizing sand in paving slab joints in accordance with manufacturer's written recommendations.

**3.07 SEALING**

- A. If specified, seal paving slabs with penetrating sealer in accordance with manufacturers' written recommendations

**END OF SECTION**