

Belgard Turfstone

Specifications

SECTION 02795

TURFSTONE GUIDE SPECIFICATION FOR CONCRETE GRID PAVEMENTS

Note: The specifier should edit this guide specification to project conditions. Use U.S. or Canadian references as appropriate.

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concrete grid units
- B. Bedding sand
- C. Topsoil and grass.
- OR -
- C. Open-graded aggregate

1.02 RELATED SECTIONS

- A. Section: Curbs and drains
- B. Section: Dense-graded aggregate base
- C. Section: Open-graded aggregate base
- D. Section: Geotextiles/Soil separation fabrics

1.03 REFERENCES

- A. American Society of Testing Materials (ASTM)
 - 1. C 1319, Standard Specification for Concrete Grid Paving Units.
 - 2. C 140, Standard Test Methods of Sampling and Testing Concrete Masonry Units.
 - 3. C 136, Method for Sieve Analysis for Fine and Coarse Aggregate.
 - 4. C 33, Specification for Concrete Aggregates.
 - 5. D 2940, Standard Specification for Graded Aggregate Material for Bases or Sub-bases for Highways or Airports.
 - 6. D 5268, Specification for Topsoil Used for Landscaping Purposes.
- B. Canadian Standards Association (CSA)
 - 1. CSA A23.1-M94, Concrete Materials and Methods of Concrete Construction.

1.04 QUALITY ASSURANCE

- A. Engage an installer who has successfully completed installations similar in type and size to this project. Installer shall provide certification of experience.
- B. As applicable by state/provincial and local laws, contractor shall hold a current contractor's and business license in the state/ province and locality where work is performed.

1.05 SUBMITTALS

- A. Submit shop or product drawings and product data.
- B. Submit samples of concrete grid paving units to indicate shape selections.
- C. Submit sieve analysis for grading of bedding sand.
- D. Submit test results for compliance of paving units to ASTM C 1319.
- E. Verify source and content of topsoil.
- F. Verify grass seed mix and sources.
- G. Verify source and gradation of aggregate base.

1.06 MOCK UPS

- A. Install a 6 ft x 6 ft (2 m x 2 m) paver area as described in Article 3.02. This area will be used to determine surcharge of the sand layer, joint sizes, lines, laying pattern(s), and texture of the job. This area shall be the standard from which the work will be judged.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Deliver concrete grid pavers to the site in steel banded, plastic banded, or plastic wrapped cubes capable of transfer by fork lift or clamp lift. Unload pavers at job site in such a manner that no damage occurs to the product.
- B. Cover sand and topsoil shall with waterproof covering to prevent exposure to rainfall or removal by wind. Secure the covering in place.

1.08 ENVIRONMENTAL CONDITIONS

- A. Do not install sand or pavers during heavy rain or snowfall.
- B. Do not install frozen sand or topsoil.

PART 2 PRODUCTS

2.01 CONCRETE GRID UNITS

A. Supplied by a Belgard manufacturer:

Akron Brick and Block, 3225 Mogadore Rd, Akron, OH 44312, 330-628-2603, fax: 330-628-4467

Amcort Utah Block, 333 S. Redwood Rd, North Salt Lake, UT 85054, 801-936-7628, fax: 801-295-5470

Balcon, 2630 Conway Rd, Crofton, MD 21114, 410-721-1900, fax: 410-793-0657

Big Rock Building Products, 600 Cardiff Valley Rd, Rockwood, TN 37854, 865-354-6660, fax: 865-354-6661

Bosse Concrete Products, 1443 Battle Creek Rd, Jonesboro, GA 30236, 770-478-8817, fax: 770-471-2128

Domine Building Products, 735 Wangum Rd, Fishers, NY 14453, 716-924-2103, fax: 716-924-2141

Eagle-Cordell Concrete Products, 6414 W Hardy St, Houston, TX 77022, 713-691-0022, fax: 713-697-8125

Easton, 800 Uhler Rd, Easton, PA 18040, 610-923-5000, fax: 610-923-5005

Foster- Southeastern, Inc, 46 Spring St, Hollbrook, MA 02343, 781-767-2202, fax: 781-767-2991

Goria Enterprises, 108 Buchanan Church Rd, Greensboro, NC 27405, 336-375-5656, fax: 336-375-8259

Jewell Concrete Products, 400 Jeweel Dr, Waco, TX 76712, 254-772-3440, fax: 254-772-6999

Miller Material Co, 2405 E 85th St, Kansas City, MO 64132, 816-444-2244, fax: 816-444-8736

Schuster's Building Products, 901 E Troy Ave, Indianapolis, IN 46203, 317-787-3201, fax: 317-788-5906

Sierra Building Products, 10714 Poplar Ave, Fontana, CA 92335, 909-355-6422, fax 909-355-6444

Superlite Block, 4150 W Turney, Phoenix, AZ 85019, 602-352-3500, fax: 602-352-0101

Young Block, 2200 W Garden Ln, Tucson, AZ 85705, 520-887-1234

4D Incorporated, 136 E. Munger Rd, Munger, MI 48747, 800-646-5546, fax: 517-659-2818

B. Turfstone: 24" x 26" x 3 1/8", Apertures 3 9/16" x 3 9/16"

C. Meet the requirements of ASTM C 1319 and test results certified by the manufacturer

2.02 BEDDING SAND

Note: The type of sand used for bedding is often called concrete sand. Sands vary regionally. Contact contractors local to the project and confirm sand(s) successfully used in previous similar applications. Bedding sand is not used in ditch liner applications, slope protection, riparian stabilization, or with boat ramps constructed with concrete grid pavers.

A. Bedding sand shall be clean, non-plastic, free from deleterious or foreign matter. The bedding sand shall be natural or manufactured from crushed rock. Do not use limestone screenings or stone dust. Grading of samples shall be done according to ASTM C 136. The particles shall be sharp and conform to the grading requirements shown in Table 1 below:

Table 1

Grading Requirements for Bedding Sand

ASTM C33 CSA A23.1-M94

Sieve Size	Percent Passing	Sieve Size	Percent Passing
3/8 in. (9.5 mm)	100	10 mm	100
No. 4 (4.75 mm)	95 to 100	5 mm	95 to 100
No. 8 (2.36 mm)	85 to 100	2.5 mm	80 to 100
No. 16 (1.18 mm)	50 to 85	1.25 mm	50 to 90
No. 30 (0.600 mm)	25 to 60	0.63 mm	25 to 65

No. 50 (0.150 mm)	0 to 30	0.315 mm	10 to 35
No. 100 (0.150 mm)	2 to 10	0.16 mm	2 to 10

2.03 TOPSOIL [OPEN-GRADED AGGREGATE]

Note: Consult with local turfgrass specialists for recommendations on grass seed mixture or sod materials.

A. Conform to ASTM D 5268, Specification for Topsoil Used for Landscaping Purposes.
-OR

A. Open-graded aggregated used to fill the openings of the grids and/or for a bedding course shall be washed and conform to ASTM C 33 No. 8 crushed stone, per the gradation requirements below in Table 2. Do not use gravel.

Table 2 ASTM No. 8 Gradation for Fill or Bedding Course

Sieve Size	Percent Passing
1/2 in. (12.5 mm)	100
3/8 in. (9.5 mm)	85 to 100
No. 4 (4.75 mm)	10 to 30
No. 8 (2.36 mm)	0 to 10
No. 16 (1.18 mm)	0 to 5

Note: Local, state or provincial standards for aggregate base materials should be used for the gradation and quality of dense-graded aggregate base materials under concrete grid pavements. If no standards exist, follow ASTM D 2940, Standard Specification for Graded Aggregate Material for Bases or Sub-bases for Highways or Airports. The gradation for base material from this standard is given in Table 3 below. This material should be compacted to a minimum of 95% standard Proctor density.

Table 3

ASTM D 2940 Gradation for Dense-Graded Base

Sieve Size ~	Percent Passing
2 in. (50 mm)	100
1 1/2 in. (37.5 mm)	95 to 100
3/4 in. (19.0 mm)	70 to 92
1/2 in. (9.5 mm)	50 to 70
No. 4 (4.75 mm)	35 to 55
No. 30 (0.600 mm)	12 to 25
No. 200 (0.075 mm)	0 to 8

Note: For open-graded bases, gradation conforming to ASTM No. 57 crushed stone aggregate is recommended. The material is typically placed in 4 to 6 in. (100 to 150 mm) thick lifts and compacted with at least four passes of a 10 T static roller. The base material should show no visible movement when compaction is complete. It should be kept free from sediment throughout the entire job. The gradation for No. 57 material is given in Table 4 below:

Table 4

ASTM No. 57 Gradation for Open-Graded Base

Sieve Size	Percent Passing
1 1/2 in. (37.5 mm)	100
1 in. (25 mm)	95 to 100
1/2 in. (12.5 mm)	25 to 60
No. 4 (4.75 mm)	0 to 10
No. 8 (2.36 mm)	0 to 5

PART 3 EXECUTION

Note: The specifier should be aware that the top surface of the pavers after compaction may be 1/8 to 1/4 in. (3 to 7 mm) above the final elevations after compaction. This difference in initial and final elevations is to compensate for possible minor settling.

3.01 EXAMINATION

Note: For vehicular areas, specify compaction of the soil subgrade to a minimum of 95% standard Proctor density for dense-graded aggregate bases. Density should be monitored in the field with a nuclear density gauge. Compaction of open-graded bases should be with at least five passes of roller compactor without vibration. Stabilization of the soil and/or base material may be necessary with weak or saturated soils.

- A. Verify that base is dry, uniform, even, free of any sediment (if open-graded), and ready to support sand, pavers and imposed loads.
- B. Verify gradients and elevations of base are correct.
- C. Verify location, type, installation and elevations of edge restraints around the perimeter area to be paved.
- D. Beginning of installation means acceptance of base and edge restraints.

3.02 INSTALLATION

- A. Spread the sand evenly over the compacted, dense-graded base course and screed uniformly to 1 – 1 1/2 in. (25 - 40 mm) thickness. The screeded sand should not be disturbed. Place sufficient sand to stay ahead of the laid grid pavers.

-OR-

- A. Spread the No. 8 material evenly over the compacted, open-graded base course and screed uniformly to 3-in. (75-mm) thickness. Compact with at least four passes of 10 T static roller until there is no visible movement. Place sufficient material to stay ahead of the laid grid pavers. Keep free from sediment during entire job.
- B. Ensure that grid pavers are free from foreign materials before installation.
- C. Lay the pavers in the pattern(s) as shown on the drawings. Maintain straight pattern lines.
- D. Joints between the pavers shall be between 1/16 in. and 1/8 in. (2 to 4 mm) wide.
- E. Fill gaps at the edges of the paved area with cut grid pavers or edge units.
- F. Cut grid pavers to be placed along the edge with a double-bladed splitter or masonry saw.
- G. Compact and seat the grids into the screeded [bedding sand] [aggregate] using a low amplitude, 75-90 Hz plate compactor capable of at least 5,000 lbs. (22 kN) centrifugal compaction force.

Note: A rubber or neoprene pad between the compactor and grids may be necessary to prevent cracking or chipping.

- H. Vibrate and compact the pavers again, sweeping [topsoil] [the small fraction of the No. 8 aggregate] into the joints and openings until it is within 1/2 in. (13 mm) from the top surface. This will require at least two or three passes with the compactor. Do not compact within 3-ft (1 m) of the unrestrained edges of the paving units.

Note: Choose paragraph H below when designing pavement for storm water runoff control without grass and topsoil. Delete paragraph H above and paragraphs J through L below.

- I. Spread ASTM No. 8 aggregate and fill openings in the pavement.
- J. All work to within 3-ft (1 m) of the laying face must be left fully compacted at the completion of each day.
- K. Broadcast grass seed at the rate recommended by seed source.
- L. Remove excess [topsoil] [aggregate] on surface when the job is complete.

Note: Use L below for installation with grass and topsoil.

- L. Distribute straw covering to protect germinating grass seed. Do not traffic pavement for [30] days.
- M. The final surface elevations shall not deviate more than $\pm 3/8$ in. (± 10 mm) under a 10 ft (3 m) long straightedge.

N. The surface elevation of pavers shall be 1/8 to 1/4 in. (3 to 7 mm) above adjacent drainage inlets, concrete collars or channels.

3.03 FIELD QUALITY CONTROL

A. After removal of excess soil/aggregate, check final elevations for conformance to the drawings.