Note: This guide specification is for concrete grid units placed on a sand bedding course over a compacted dense-graded aggregate base. The text allows an option of topsoil and grass or gravel in the grid openings over bedding sand. This specification is for vehicular applications such as access roads and emergency fire lanes, as well as intermittently used overflow parking areas. This text must be edited to suit permeable requirements for projects. This Section includes the term “Architect.” Edit this term as necessary to identify the design professional in the General Conditions of the Contract.

PART 1 GENERAL

1.01 SUMMARY
A. Section includes:
1. Concrete grid units.
2. Bedding sand.
3. Edge restraints.
5. Topsoil and grass for the grid openings.
B. Related Sections:
1. Section [______]: Curbs and drains.
2. Section [______]: Dense-graded aggregate base.

1.02 REFERENCES
1. ASTM C 33, Specification for Concrete Aggregates.
3. ASTM C 140, Standard Test Methods of Sampling and Testing Concrete Masonry Units.
5. ASTM C 1319, Standard Specification for Concrete Grid Paving Units.
8. ASTM D 2940, Standard Specification for Graded Aggregate Material for Bases or Subbases for Highways or Airports.
10. Canadian Standards Association (CSA) 1. CSA A23.1, Concrete Materials and Methods of Concrete Construction
11. Interlocking Concrete Pavement Institute (ICPI), Tech Spec #8 Concrete Grid Pavement

1.03 SUBMITTALS
A. In accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.
B. Manufacturer’s drawings and details: Indicate perimeter conditions, relationship to adjoining materials and assemblies, expansion and control joints, paving slab [layout,] [patterns,] [color arrangement,] installation [and setting] details.
C. Sieve analysis per ASTM C 136 for grading of bedding and base materials.
D. Source and content of topsoil and grass seed [sod].
E. Concrete grid units:
1. One representative full-size sample of grid unit, thickness, color, expected in the finished installation.
2. Accepted samples become the standard of acceptance for the work.
3. Test results from an independent testing laboratory for strength compliance requirements to ASTM C39.
4. Manufacturer’s catalog literature, installation instructions, and material safety data sheets for the safe handling of the specified materials and products.

1.04 QUALITY ASSURANCE
A. Paving Subcontractor Qualifications:
   1. Engage an experienced installer who has successfully completed grid pavement installations similar in design, material, and extent indicated for this Project.
   2. Hold a current certificate from the Interlocking Concrete Pavement Institute Concrete Paver Installer Certification program.

1.05 DELIVERY, STORAGE, AND HANDLING
A. General: Comply with Division 1 Product Requirement Section
B. Deliver concrete grid units to the site in steel banded, plastic banded, or plastic wrapped packaging capable of transfer by forklift or clamp lift. Unload grids at job site in such a manner that no damage occurs to the product or existing construction.
C. Cover sand with waterproof covering to prevent exposure to rainfall or removal by wind. Secure the covering in place.
D. Coordinate delivery and paving schedule to minimize interference with normal use of buildings adjacent to paving.

1.06 ENVIRONMENTAL CONDITIONS
A. Do not install bedding materials or grid units during heavy rain or snowfall.
B. Do not install bedding materials and grid units over frozen base materials.
C. Do not install frozen bedding materials.

1.07 GRID PAVING MAINTENANCE MATERIALS:
A. Supply Checker Block in unopened pallets with contents labeled. Store where directed.

PART 2 PRODUCTS

2.01 CONCRETE GRID UNITS
A. Manufacturer: Reading Rock, an authorized and licensed manufacturer.
   4600 Devitt Drive, Cincinnati, Ohio 45246 P: (513) 874-2345
B. Basis of Design Concrete Grid Units: Checker Block
C. Color: Natural - stock color
D. Size: 24” x 24” x 4” thick
E. Reinforcement: 6”/6” x 6 gauge welded wire
F. Pallet Size: Shipped in half pallets, 10 pieces/pallet equals 40 sq ft
G. Minimum Average Compressive Strength: 5,000 psi at 28-days per ASTM C-1319
H. Product dimensional tolerance shall be +/- 1/8”

2.02 PRODUCT SUBSTITUTIONS
A. No substitutions permitted.

2.03 BEDDING MATERIALS
A. General – Sieved per ASTM C 136.
B. 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 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 units.
   1. Washed, clean, hard, durable crushed gravel or stone, free from shale, clay, friable materials, organic matter, frozen lumps, and other deleterious substances.
   2. Conforming to the grading requirements in Table 1 below.
   3. Do not use limestone screenings.
2.04 BASE MATERIALS

Note: Local, state or provincial standards for aggregate base materials for roads 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 Subbases for Highways or Airports. The gradation for base material from this standard is based on ASTM D2940, below. This material should be compacted to a minimum of 95% standard Proctor density.

### Table 1
Grading Requirements for Bedding Sand

<table>
<thead>
<tr>
<th>ASTM C33 or CSA A23.1-FA1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sieve Size</td>
</tr>
<tr>
<td>3/8 in. (9.5 mm)</td>
</tr>
<tr>
<td>No. 4 (4.75 mm)</td>
</tr>
<tr>
<td>No. 8 (2.36 mm)</td>
</tr>
<tr>
<td>No. 16 (1.18 mm)</td>
</tr>
<tr>
<td>No. 30 (0.660 mm)</td>
</tr>
<tr>
<td>No. 50 (0.150 mm)</td>
</tr>
<tr>
<td>No. 100 (0.150 mm)</td>
</tr>
</tbody>
</table>

2.05 FILL MATERIALS FOR GRID OPENINGS

A. Topsoil: Conform to ASTM D 5268.

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

B. Grass seed [Sod]: [mixture and source].

C. Granular stone infill: [specify gradation].

2.06 ACCESSORIES

A. Provide accessory materials as follows:

1. Geotextile – woven separation fabric: [Specify brand]

B. Optional edge restraints installed around the perimeter of all concrete grid paving unit areas as follows:

1. Material: [Plastic] [Concrete] [Aluminum] [Steel] [Precast concrete] [Cut stone] [none].
PART 3 EXECUTION

3.01 EXAMINATION
A. Acceptance of site verification conditions:
1. Contractor shall inspect, accept and verify in writing to the grid installation subcontractor that site conditions meet specifications for the following items prior to installation of bedding materials and concrete grid units:
   a. Verify that drainage and subgrade preparation, compacted density and elevations conform to specified requirements.
   b. Verify that geotextiles, if applicable, have been placed according to drawing and specifications.
   c. Verify that base materials, thickness, compacted density, surface tolerances and elevations conform to specified requirements.
   d. Provide written density test results for the soil subgrade, base materials to the Owner, Contractor, and grid installation subcontractor.
2. Do not proceed with installation of bedding materials and concrete grids until [subgrade soil and] base conditions are corrected by the Contractor or designated subcontractor.

3.02 PREPARATION
A. Verify that base is dry, certified by Contractor as meeting material, installation and grade specifications are ready to support sand, grids and imposed loads.
B. Edge Restraint Preparation:
   1. If required, install edge restraints per the drawings and manufacturer’s recommendations at the indicated elevations.
   2. Mount directly to finished base. Do not install on bedding sand.
   3. The minimum distance from the outside edge of the base to the spikes shall be equal to the thickness of the base.

3.03 INSTALLATION
Note: Stabilization of the subgrade and/or base material may be necessary with weak or saturated subgrade soils.

Local aggregate base materials typical to those used for highway flexible pavements are recommended, or those conforming to ASTM D 2940. Mechanical tampers are recommended for compaction of soil subgrade and aggregate base in areas not accessible to large compaction equipment. Such areas can include that around lamp standards, utility structures, building edges, curbs, tree wells and other protrusions. The recommended base surface tolerance should be ±3/8 in. (±10 mm) over a 10 ft. (3 m) straight edge. The elevations and surface tolerance of the aggregate base determine the final surface elevations of concrete grids. The installation contractor cannot correct deficiencies in the base surface with additional bedding materials. Therefore, the surface elevations of the base should be checked and accepted by the General Contractor or designated party, with written certification to the paving subcontractor prior to placing bedding materials and concrete grids.

A. Compact soil subgrade to 95% standard Proctor density per ASTM D 698 for pedestrian and light vehicular loading.
B. Install a minimum of 8 in. of compacted (95% standard Proctor density), dense-graded base course for light loading and a minimum 12 in. of compacted (95% standard Proctor density), dense-graded base course for heavy vehicular loading, or greater thickness based on the project engineer’s requirements.
C. Spread the 1” bedding sand layer evenly over the compacted, base course and screed uniformly.
D. Ensure the grid units are free from foreign materials before installation.
E. Lay the grid units on the bedding sand in the pattern shown on the drawings. Maintain straight joint lines.
F. Joints between the grids shall be maintained so that units do not touch but not exceed 3/16 in. (5 mm).
G. Ensure that grid pavers are seated and leveled with roller compactor or static roller drum.
H. Cut grid pavers only if needed, along the edge with a double-bladed splitter or masonry saw.
I. Use tie rods to anchor units on slopes steeper than 3:1.
J. Sweep top soil into the joints and openings until full.
K. Broadcast grass seed at the rate recommended by seed source. Place sod plugs into openings. Add topsoil to the surface to cover the seeds.
L. Remove excess topsoil on surface when the job is complete.
M. Distribute straw covering to protect germinating grass seed or sod. Water entire area. Do not traffic pavement for 30 days, if seeded.

3.05 FIELD QUALITY CONTROL
A. After removal of excess top soil, check final elevations for conformance to the drawings. Allow $\frac{1}{8}$ to $\frac{1}{4}$ in. (3 to 6 mm) above specified surface elevations to compensate for minor settlement.
B. The final surface tolerance from grade elevations shall not deviate more than $\pm \frac{3}{8}$ in. (10 mm) over a 10 ft (3 m) straightedge.
C. The surface elevation of grid units shall be $\frac{1}{8}$ to $\frac{1}{4}$ in. (3 to 6 mm) above adjacent drainage inlets, concrete collars or channels.
D. Lippage: No greater than $\frac{1}{8}$ in. (3 mm) difference in height between adjacent grid units.

3.06 PROTECTION
A. After work in the section is complete, the Contractor shall be responsible for protecting work from damage due to subsequent construction activity on the site.

3.07 READING ROCK, INC. PRODUCT WARRANTY

Reading Rock, Inc. ("Reading Rock") warrants its manufactured hardscapes products (i.e., paving stones, retaining and seat walls, AB fence system and landscape accents) to meet ASTM manufacturing guidelines and specifications for the life of the product, provided the products have been properly installed, used and maintained according to industry accepted guidelines and as recommended by the manufacturer. Reading Rock warrants pavers manufactured with Colorlock to meet ASTM C979 standard specifications for pigments used in the coloring of concrete products. This warranty does not cover damage resulting from improper installation, abuse, accidents, Acts of God, erosion from water, fire, normal wear and tear, unauthorized modifications, misuse or failure to properly maintain. This warranty is limited to the products’ original purchaser and proof of purchase is required. Reading Rock production tags from the warranted product must accompany all requests for warranty. This warranty is not transferable.

Defective or otherwise non-conforming manufactured products shall be removed and returned to Reading Rock, at the customer’s sole cost and expense, where they will be tested by a certified materials laboratory in accordance to applicable ASTM standards. Any product that does not meet applicable ASTM specifications or acceptance criteria will be replaced by Reading Rock.

Reading Rock’s liability and the customer’s exclusive and sole remedy for breach of warranty will be limited to replacement of the goods, or at Reading Rock’s sole and absolution option, refund of the purchase price of any goods. Reading Rock’s warranty does not include any other costs, including the cost of labor for replacement. Exact color matching and shape of replacement materials cannot be guaranteed. Reading Rock, in its sole and absolute discretion, may provide customer with an alternate color and/or shape available from its current product line at the time a warranty claim is accepted.

Due to the nature of the product and the manufacturing process, “efflorescence” may be present and does not constitute defective product. Efflorescence is a whitish, powder-like deposit that may appear on concrete products. It in no way affects the structural integrity of the concrete product and will wash and wear off over time. Industry acceptable products are available to assist in the cleaning and removal of efflorescence. The use of concrete setting beds may also increase the possible occurrence of efflorescence. Because this is a natural occurrence, Reading Rock accepts no responsibility or liability for this condition.

Reading Rock, Inc. Product Warranty continued:
There are no warranties offered by Reading Rock beyond this express warranty. This warranty is expressly in lieu of all other warranties, express or implied, and Reading Rock makes no warranty as to merchantability or fitness of the goods sold for any particular purpose, particularly as to results obtainable by the customer, or its customers or assigns in the use of such products. Any samples provided are not to be considered warranties of goods. Reading Rock’s liability and the customer’s exclusive and sole remedy for breach of warranty will be limited to replacement of the goods, or at Reading Rock’s option, refund of the purchase price of any goods. Reading Rock cannot guarantee that the color of any replacement goods will match the color of the defective goods or of original goods which are not replaced, and replacement labor is not included. Reading Rock will have no liability beyond the purchase price nor will Reading Rock be liable for any special, consequential, incidental or indirect damages incurred in connection with the goods.

This warranty specifically does not apply to (I) Manufactured hardscape products sold by Reading Rock on an “as is” basis, such as “overruns”, “seconds,” and “irregulars”, or (II) any products sold by Reading Rock but not manufactured by Reading Rock.

This warranty is effective October 1, 2010. The laws of the State of Ohio govern this warranty.