NICOLOCK®
paving stones & retaining walls
paver-shield™

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Checker Block Snow Guidelines.

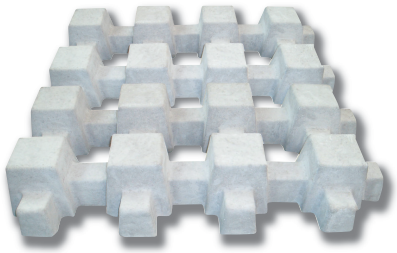
Below are a few bullet points to make sure you are aware and guided through snow removal and maintenance.

- Due to the open surface areas, the water from the melting snow will be absorbed back into the soils and not build up, therefore it will have a superior advantage to ice buildup because there will be no water pooling and water surface freeze.
- Checker Block is a concrete product and therefore if you need to use any de-icing products you should use them sparingly. If you are looking for better traction we recommend using a sand. All concrete block should be treated with caution when it comes to de-icing products
- Plows should be lifted 1-2 inches above surface this will aid in any unnecessary possible damage.
- This product is reinforced and therefore it has a great ability for weight transfer and load supporting ability.

Carl Peterson
Director of Education
Product Development
Nicolock Pavingstones
908-482-8483

REINFORCE YOUR TURF WITH STRENGTH & BEAUTY

checker block®



24" x 24" x 4"
available in natural color

75% SURFACE OPENING

HASTINGS

For more information visit www.checkerblock.com

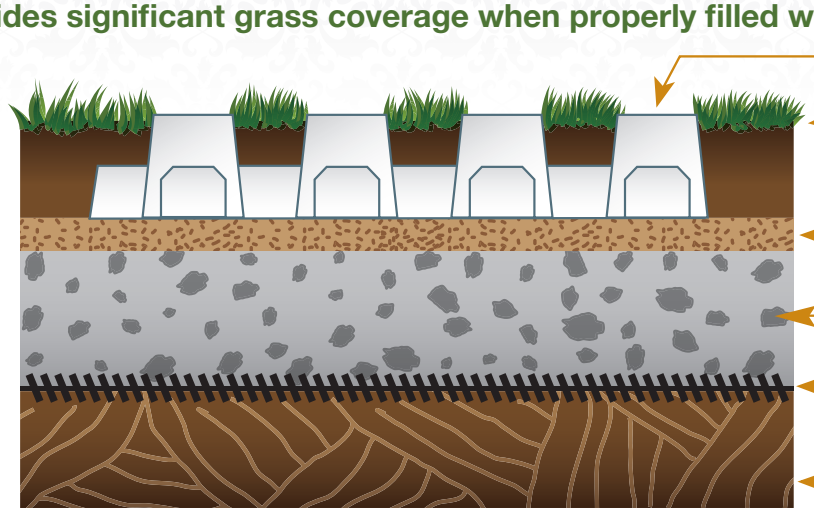
Checker Block® Features & Benefits:

- Steel-reinforced, 4" thick, heavy-duty slab with thick webs, ideal for commercial application.
- Pervious concrete grid.
- Approved for H-20 loading for parking, service roads, tree pits, and fire lanes. It is also Ideal for stabilizing embankments along streams, rivers, and lakes.
- LEED® credit potential: Open grid pavement with an SRI > 29; stormwater runoff reduction; and regional materials.
- Checker Block is manufactured in accordance with ASTM 1319, (Standard Specification for Concrete Grid Paving Units) which requires a minimum compressive strength of 5,000 psi.
- Large surface void area allows for significant turf establishment (not always feasible with plastic or Turfstone products).

checker block®

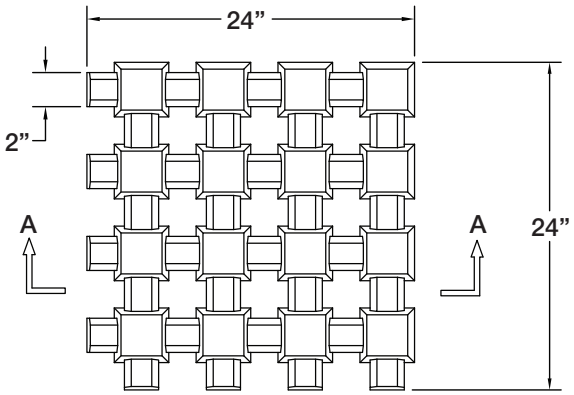
Strength plus nature's beauty.

The unique waffle-like configuration of this pervious castellated product provides significant grass coverage when properly filled with topsoil.

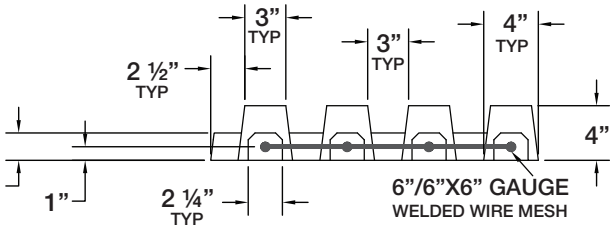


Each 4 square foot unit is 4" thick, and provides a 75% grass to concrete ratio (ratio measured by each 4 s.f. section), ensuring a green turf that can support significant vehicular loads.

CHECKER BLOCK: TOP VIEW



CHECKER BLOCK SIDE VIEW



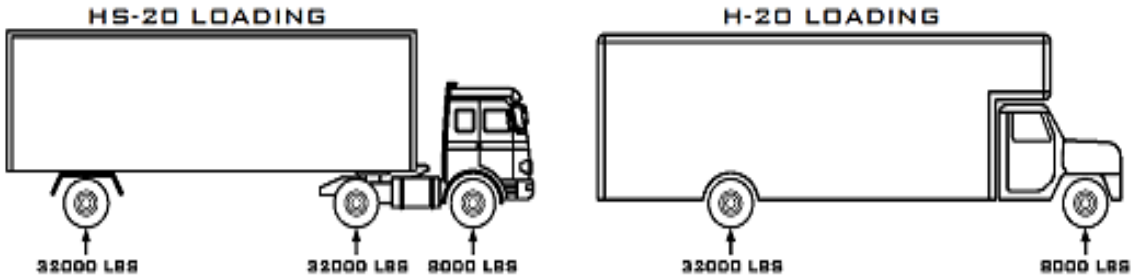
specifications

width	length	height	pieces per s.f.	s.f. per pallet	pieces per pallet	pallet weight
24"	24"	4"	.25	80	20	2000

CHECKER BLOCK TECHNICAL NOTE

TRAFFIC LOADING CALCULATION EXAMPLE

The following calculations demonstrate that Checker Block, a permeable reinforced grid paver, satisfies the requirements of meeting or exceeding an H20 or HS20 loading by comparing the theoretical design loads to the compressive strength of Checker Block.



Step #1) Determine the maximum wheel load:

W_L = 32,000 lb/ 2 (divide by 2 since there are two tires per axle) W_L = 16,000 lb

Step #2) Increase the load by 30% to account for dynamic forces associated with moving vehicles:

$W_{L\text{-Dynamic}} = W_L \times 1.30$ $W_{L\text{-Dynamic}}$ = 20,800 lb

Step #3) Determine the tire contact area:

FHWA has defined an acceptable default tire contact area as a rectangle with an area of $0.01W_L$ (in^2) with a length-to-width ratio of 1:2.5.

$A_{contact} = 0.01\ W_L$ $A_{contact} = 0.01 \times (16{,}000\ lb) = 160\ in^2$

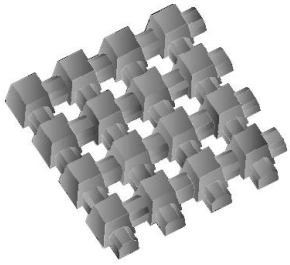
Check dimensions of contact area by confirming that $A_{contact}$ also = 160 in^2

$L = \sqrt{\frac{160}{2.5}} \cdot in$ W = (2.5 x L) L= 8 in W = 20 in

$A_{contact}$ = L X W = 8 in x 20 in = 160 in^2 … checks.

Step #4) Determine the stress exerted per tire in the dynamic load:

$$\sigma_{tire} = \frac{W_{L\text{-}dynamic}}{A_{contact}} \qquad 20{,}800 \text{ lb}/160 \text{ in}^2 \qquad \sigma_{tire} = 130 \frac{\text{lb}}{\text{in}^2}$$



Step # 5) Compare Checker Block strength to H20 or HS20 loading:

Checker Block is manufactured to ASTM C1319 standards requiring a minimum compressive strength of 5,000 psi, which is well in excess of any H20 or HS20 theoretical loading scenarios. As illustrated above, the maximum theoretical tire pressure exerted is 130 psi, so stresses are effectively transferred to the base and subgrade using Checker Block. This significant factor of safety, along with unique steel reinforcement, makes Checker Block the strongest concrete grid paver on the market. Checker Block is castellated, with a 75% turf surface area; optimized for grass establishment. No lattice grid paver can compare to the safety, strength, and turf coverage of Checker Block.

The subgrade soil and base preparation are critical to the performance of any pavement or paver system subjected to vehicular traffic. The subgrade soil and base, in addition to the paver product, must be able to safely transfer the load into the underlying foundation subgrade soil in a stable manner. The above calculations demonstrate that Checker Block is capable of supporting heavy vehicular design loading, but it is up to the design engineer to ensure that an adequate base thickness is specified and that verification of subgrade soil occurs prior to installation of any paver product. All pavement design is site-specific based on actual soil conditions and anticipated vehicular loading patterns.

Nicolock offers the following base thickness guidelines for typical Checker Block applications:

Minimum Dense-Graded Aggregate Base Thickness Guidelines for Checker Block[1]

Conditions	**Subgrade Soil Types**	**Residential Loading** Driveways, walkways, paths, cart paths, trails	**Commercial Loading** Streetways, emergency access, erosion control, slopes, boat ramps
Stable, firm, dry granular soils (CBR > 10)	GP, GW, GC, SW,	**8-inch base**	**8-inch base**
Ground ruts with vehicular traffic (5<CBR<10)	SP, SC	**10-inch base**	**12-inch base**
Ground is soft, moist, and ruts easily (CBR<5)	ML, CL, MH, CH	**12-inch base**	**16-inch base**

[1] notes:

- Subgrade is compacted to 95% of standard Proctor density.
- No free-standing water is observed and a 6 oz woven separation fabric is installed to separate the subgrade from the base material.
- A 1" to 1.5" thick leveling sand bed is used to set the Checker Block grid pavers.

ATTACHMENT 3: CITY OF PORTLAND DEPARTMENT OF PUBLIC WORKS CORRESPONDENCE

Craig Sweet

From: Bradley Roland <brad@portlandmaine.gov>
Sent: Monday, July 23, 2018 3:22 PM
To: Lauren Swett
Cc: Craig Sweet
Subject: Re: MMC Garage Stormwater

Hello Lauren,
The St John Street storm drain system will be able to accommodate the proposed 3 CFS from the entrance roadway to the new MMC garage.
No questions on my end.
Just plan to tie into the pipe or a manhole as opposed to a catch basin (which we prefer not to allow).
Brad
--
Bradley A. Roland, P.E.
Senior Project Engineer
Portland Public Works
55 Portland Street
Portland, ME 04101
Tel: 207-874-8840
Fax: 207-874-8852
brad@portlandmaine.gov

On Thu, Jul 19, 2018 at 1:58 PM, Lauren Swett <lswett@woodardcurran.com> wrote:

> Hi Brad,
>
> A few weeks ago we discussed the ability to connect a portion of the site stormwater from the Maine Medical Center Garage project to the stormdrain in St. John Street. The garage itself and a majority of the site will discharge to the stormdrain system that exits the 222 St. John Street parking lot under the railroad tracks and through the County Jail. The portion of the site that fronts on St. John Street, which includes an access driveway and a landscaped area, will discharge to the stormdrain in St. John Street. Attached is the post-development stormwater figure, that shows Subcatchment 4S as the area that drains to St. John Street. In the 25-year storm, the flow from this area will be approximately 3 CFS.
>
> Can you please confirm that this connection to St. John Street will be acceptable, and if you any questions or need any other information?
>
> Thanks for the help!
>
> Lauren

Lauren Swett, P.E.*

Technical Manager

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