



## FUNDAMENTALS OF ROOFTOP PAVING SYSTEMS

The use of roof tops for amenity spaces has increased dramatically. This is due to both environmental and economic features including:

- **Reducing land consumption**
- **Increased energy efficiency**
- **Improved occupant comfort levels**
- **Reducing life cycle cost of the roof system**
- **Increasing the usable square footage of the structure**

Roof tops covered in pavers create a welcoming space while protecting the roof system from damaging factors such as impact, thermal shock and UV degradation. These factors can lead to premature failure to the roof system resulting in costly repairs and / or replacement. By utilizing pavers on roof decks, not only are these factors mitigated, but the paving units also create a durable and attractive area.

Concrete, natural stone, porcelain and wood paving units can be installed over occupiable space by using either an aggregate base or pedestal system. For either system, full perimeter containment must be in place to prevent any lateral movement. All paving units to have a dimensional tolerance +/- 1/16". The following are basic

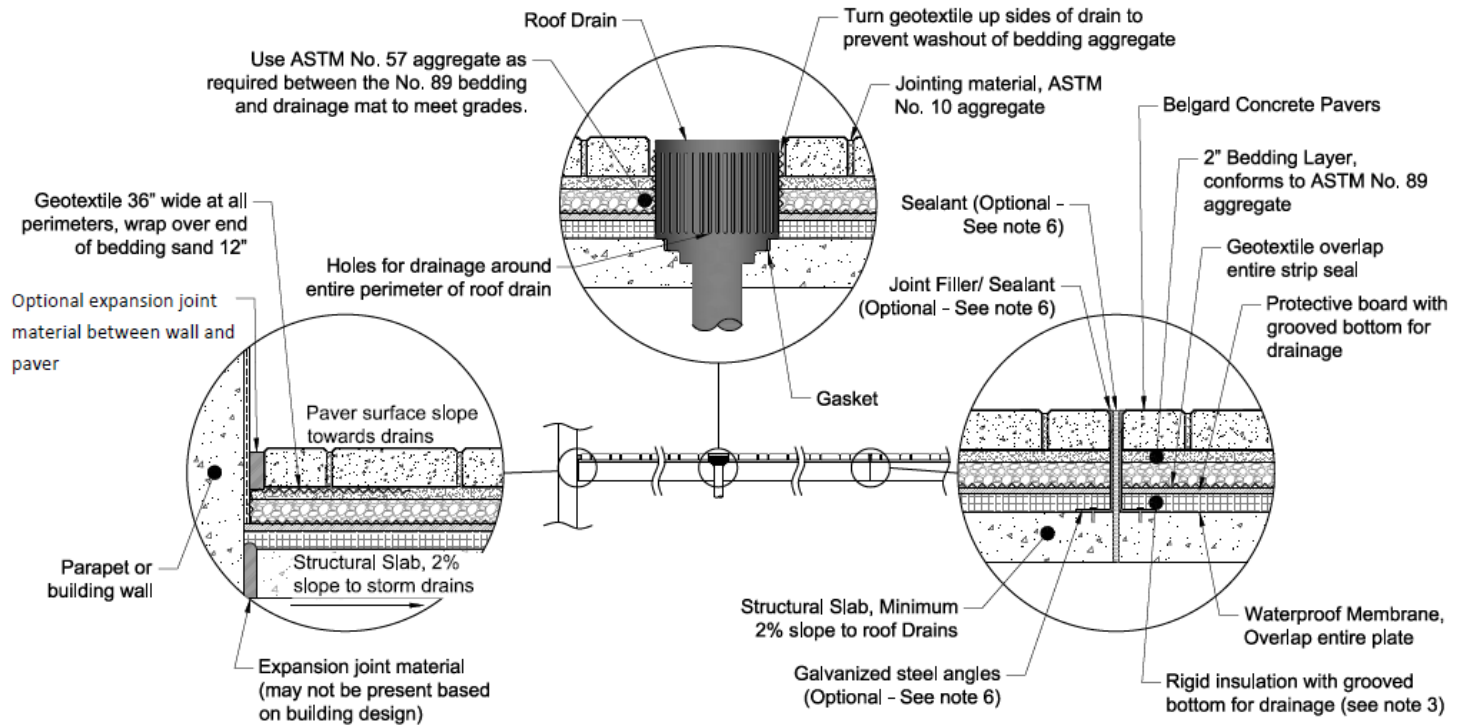
guidelines for each installation option. Please review specific technical specifications for the type of paving unit being installed to ensure proper compatibility with the installation system and intended use.

For aggregate set applications, the system would include the following elements:

- **Structural slab with a minimum 2% slope to roof drains**
- **Waterproofing system compatible with application**
- **Rigid insulation with grooved bottom for drainage (recommended minimum 40 psi compressive strength)**
- **Protection board with grooved bottom or approved drainage mat (optional based on insulation used)**
- **Geotextile**
- **ASTM No. 57 aggregate**
- **2" Bedding layer that conforms to ASTM no. 89 aggregate**
- **Paving unit (concrete, natural stone, or porcelain pavers)**
- **ASTM No. 10 aggregate for jointing**
- **Perimeter containment**

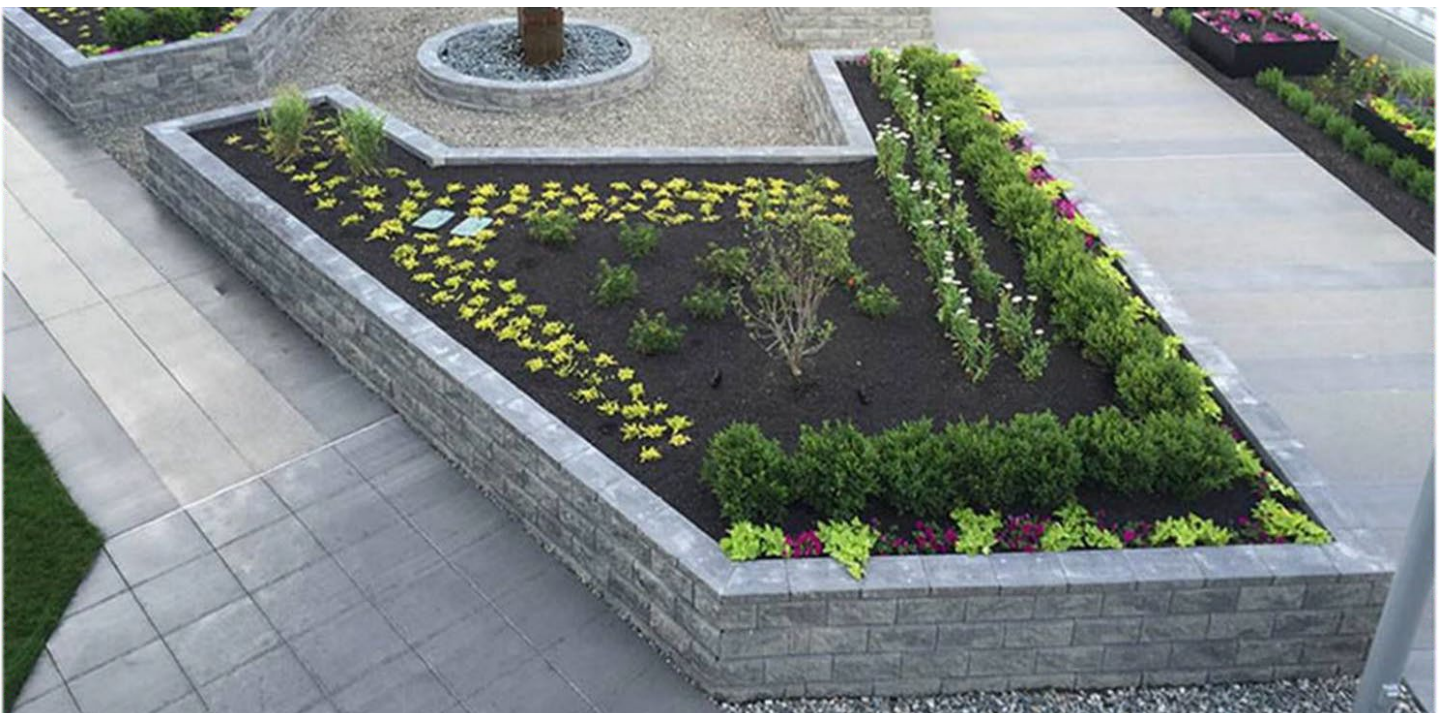


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#### Design Notes:

1. Cross section as shown is intended for pedestrian use. If any vehicular traffic loading is expected, contact Belgard Commercial for design assistance, as additional static and dynamic loads need to be accounted for.
2. Structural analysis to verify that the roof deck can handle the additional weight of the pavers and sand is by others.
3. Thickness of rigid insulation based on local codes and climatic conditions.
4. Check with the local building codes for ballast requirements (based on wind loading).
5. Ensure the geotextile to be used has good drainage characteristics and is not prone to clogging.
6. Continuation of the structural slab expansion joint to surface is not required with aggregate set pavers, consult with the design engineer.



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Pedestal set pavers are gaining popularity for roof top applications. This is in large part due to the ability to compensate for the slope of the deck while creating a level and stable pedestrian surface. Additionally, the pedestals create a space that allows for unimpeded water drainage and airflow as well as easy access for utility lines and roof drains. For pedestal set applications the system would include the following elements:

- A. Structural roof deck (typically concrete or steel)**
- B. Insulation (optional). Must be minimum 40 psi compressive or add protection board**
- C. Protection board (optional based on system)**
- D. Roofing system (membrane, built-up, modified bitumen, liquid applied, etc.)**
- E. Roof drains**
- F. Pedestals (fixed height and / or adjustable)**
- G. Paving unit (concrete, natural stone, porcelain or wood)**

Roof top paver systems should be inspected on a regular basis to ensure level with no movement. Pavers can be cleaned with the following precautions taken:

- 1. Use a broom or blower to remove any loose debris from paving surface.**
- 2. Power sprayers should be minimized as it is possible to damage the paving units if excessive pressure is used in a concentrated area.**
- 3. Chemical cleaning agents appropriate for the type of paving unit can be used if they are approved by the roofing system manufacturer. Follow cleaning agents' instructions fully. Oldcastle assumes no responsibility for damage caused to the pavers or roof system as a result of cleaners used.**

It is critical that a structural engineer evaluate the project when installing roof top pavers for either aggregate or pedestal set system. Doing so will ensure the structure can accommodate the dead load of the system as well the live loads that will be imposed on it. Additionally, consideration needs to be given to wind uplift requirements for all elevated deck areas. Site specific positive and negative uplift pressures for each zone are to be provided by architect or project engineer.

**Please contact your local Belgard representative for additional or specialized details.**



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