

PROJECT PROFILE



PAVESTONE®

EARTH FRIENDLY PAVING SOLUTIONS



PERMEABLE PAVERS

PETERSON AIR FORCE BASE - COLORADO SPRINGS, CO

CASE STUDY

A portion of Paine Street was serviced by a storm sewer system which was at capacity, while the other portion discharged directly into Sand Creek. Peterson AFB was restricted from increasing the discharge into the creek without a method of controlling the release rate. As the surrounding area was completely developed, a detention pond was not feasible. A complete storm sewer upgrade and replacement was too expensive. Upon final review, the best possible option for detention, flow control and cost was the use of a permeable interlocking concrete paver with an aggregate sub-base storage layer.

- Client: Peterson AFB - Colorado Springs, Colorado
- Architect: Randy Hawke - 21st Civil Engineering Group Architect
- Engineer: Fred Brooks - 21st Civil Engineering Group
- Paver Contractor: TDF Construction - Colorado Springs, CO
- Application: Storm Drainage Repair

Photos are from construction on building 2028 parking lot

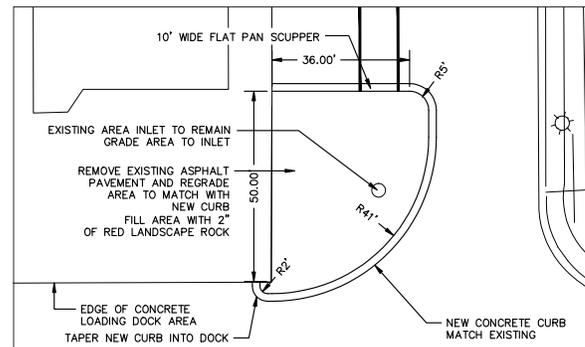
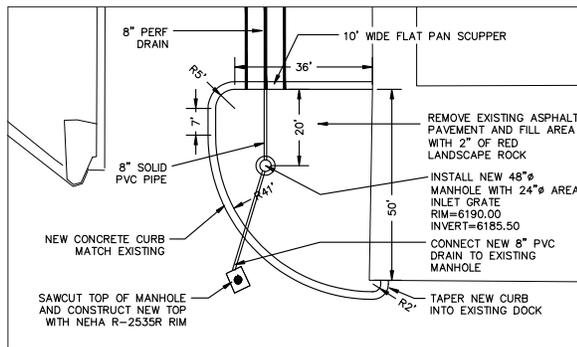


CASE STUDY

PETERSON AIR FORCE BASE - COLORADO SPRINGS, CO



MASTER PLANNING



Eco-Priora™



Construction Details

- Paver 3 1/8" (80mm) thick Eco-Priora™
- Square Footage 19,000 sq ft
- Bedding & Joint Material 2" thick (ASTM #8 stone - 3/8" minus stone chip)
- Base Material 4" thick (ASTM #57 stone - 1 1/2" minus open graded)
- Subbase Material 11" thick (ASTM #2 stone - 2" minus open graded)
- Subgrade Material CH Clay
- Cross Section Drainage 8" Perforated Pipe

THE CHALLENGES

A multitude of drainage issues, including standing water and rutted pavements in areas not designed for water, can cause nightmares for any engineer. This is precisely what was occurring on Paine Street at Peterson Air Force Base. Members of the 21st Civil Engineering Group and base engineer Fred Brooks realized the status quo was no longer acceptable and something innovative had to be done to correct this problem.

All agreed there were limited options available and a number of constraints. The affected area contained many older buildings - 650, 652, 654, 656, 660, 662, 664 & 666 - all of which drained onto Paine Street. Down spouts ran directly into flat areas, causing minor flooding in the low lying areas around the buildings.

The conditions at Paine Street allowed the 21st Civil Engineering Group some unique opportunities. For monitoring purposes, they were able to design two independent sections. The first incorporated the designed aggregate storage layer, but included a drain pipe located at the sub grade. In theory, during periods of high volume runoff, the storage layer would provide a buffer for the drain pipe, controlling the desired discharge rate while providing on site detention. The second section incorporated the same aggregate storage layer but omitting the drain pipe. As the sub base is a silty/sand, this was a perfect opportunity to determine system capabilities for direct infiltration.

LEED Point Certification was also an important factor for the base. Components of SS 6.1, Stormwater Design Quantity Control and SS 6.2, Stormwater Design Quality Control were addressed through controlling peak flows, erosion mitigation through runoff reduction, decreasing impermeable surface areas and increasing on-site infiltration.

“So far, the product has performed wonderfully with snow melt. More information to follow after some significant rain events...very pleased with the look of the product and the immediate aesthetic value to the surrounding warehouse district.”

Fred Brooks-
21st Civil Engineering Group

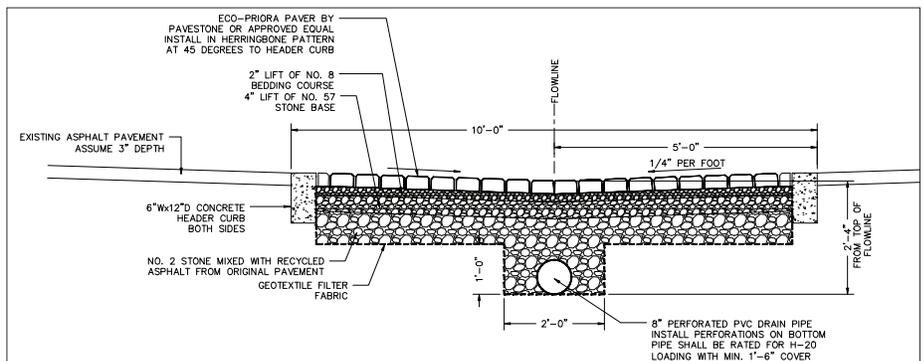
When asked if they would use Eco-Priora in other projects, Fred indicated, “Absolutely...in fact we are!”

In addition, the base maintenance team likes the ability to “unzip” the pavement, complete required utility repairs, then re-install.

THE PAVERS

After extensive research, Fred chose the Eco-Priora™ produced by Pavestone Company, Colorado Springs. The Eco-Priora™, licensed through Uni-Group USA, meets or exceeds ASTM C-936 specifications. Pavestone Company is a national firm with two locations in Colorado and provides the dual benefit of 30 years of industry experience coupled with local manufacturing and sales support. The manufacturer also provided a specific blend of colors to match existing structures.

With facilities in Colorado Springs and Denver, Pavestone Company easily met the criteria for MR 5.1 and 5.2, Materials Resources, Regional Material. With multiple manufacturing locations, Pavestone Company meets MR 5.1 and 5.2 for the majority of the nation.



PETERSON AIR FORCE BASE - COLORADO SPRINGS, CO



THE PROJECT

The catchment area incorporated 35 acres which was primarily a medium industrial use pavement with a curve number (CN) of 91, indicative of Peterson AFB pavements. The 21st Civil Engineering Group calculated a time of concentration of 50 minutes, the time it would take for precipitation to travel from the furthest extent of the drainage area to an outlet source.

As the area would see traffic and provide parking for the buildings, project specifications called for the 3 1/8 inch thick Eco-Priora paver, installed on a 2 inch bed of #89 stone, a 4 inch lift of #57 stone and a 6 inch lift of #2 which was mixed with recycled asphalt from the original pavement. A woven geo textile was included between the #2 and sub-grade.

Eco-Priora™

The unique Eco-Priora™ joint profile allows surface water to infiltrate into the pavement and its sub-layers. With initial permeability average flow rates of over 100 inches per hour, the Eco-Priora™ product, even with extended use, will still meet the majority of current stormwater management plans (SWMP).



11110 Charter Oak Ranch Road, Colorado Springs, Colorado Phone (719) 322-0101 Fax (719) 322-0123 Toll Free (866) 409-7991

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