BELGARD® HARDSCAPES

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CASE STUDY NO. 17

THE BELGARD COLLECTION

PAVEMENT SOLUTION

The permeable paving system of Eco-Holland Stone was chosen in order to meet structural, Stormwater Management and ADA Compliancy requirements.

MANUFACTURED BY

Oldcastle Coastal, Orlando, Florida

PRODUCTS

Eco-Holland Stone

INSTALLATION

Parking Lot Expansion

PROJECT

Commercial

LOCATION

Pinellas Park, Florida

ECO-HOLLAND STONE

NOMINAL DIMENSIONS:
4" × 8" × 3 1/8"

With ever-changing local, state and federal requirements, storm water management presents its challenges. In this case, excellent teamwork resulted in an award winning solution.

PROBLEM

The larger of the two lots to be developed fell within a flood plain. Managing storm water runoff was a paramount issue that required careful planning in order to comply with Southwest Florida's water management requirements for storage volume and infiltration. The lot also had to be durable, attractive and ADA compliant.

SOLUTION

The low impact solution was achieved through a combination of precise engineering and the use of a proven permeable pavement system. The system chosen was one developed by Belgard® Hardscapes, a leader in the development of permeable technology.

ADA COMPLIANT

LT. VEHICULAR–80MM

BELGARD
–environmental–

PAVING STONES: Eco-Holland Stone

PERMEABLE REQUIREMENT: 70,000 sq. ft.

COLORS: Harvest Blend.

INSTALLATION TIME: Completed in approximately 3 months which included down time between phases one and two.

INSTALLATION METHOD: Hand installed by one comany with anywhere from 5 to 15 men on any given day.

APPROXIMATE VALUE OF INSTALLED HARDSCAPING: $515,000.

APPROXIMATE VALUE OF THE OVERALL PROJECT: $830,000.

DEVELOPER: City of Pinellas Park

ENGINEER: Cardno TBE, Bryan Zarlenga PE

BELGARD REPRESENTATIVE: Bill Megrath

BELGARD DISTRIBUTOR: Manufacturer Direct

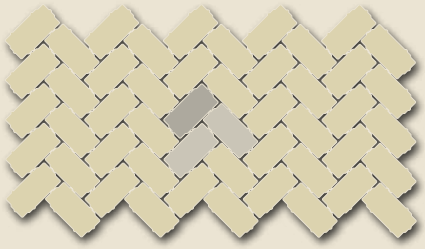
BELGARD DEALER: Manufacturer Direct

BELGARD CONTRACTOR: Paver and setting bed installation, Paver Crafters, Mr. Doug Corey; Base and sub-base installation, MTM Construction

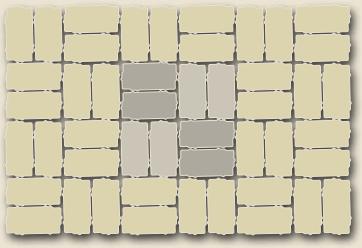
BELGARD MANUFACTURER:
Oldcastle Coastal, Orlando, Florida

COMMON LAYING PATTERNS

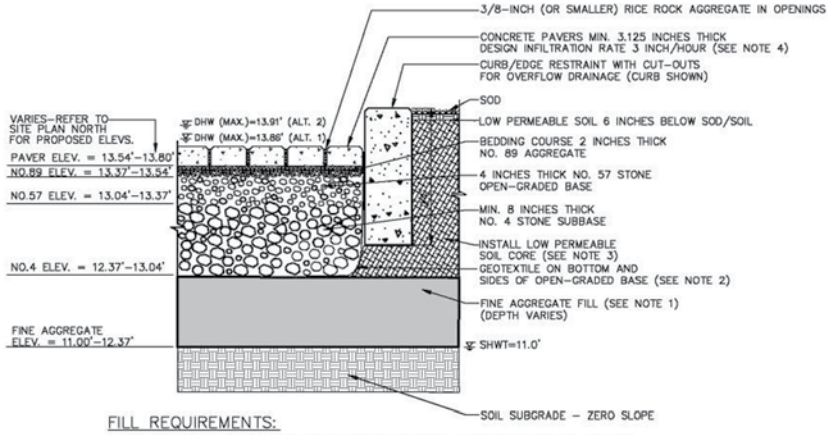
RUNNING BOND



HERRINGBONE 45°



BASKET WEAVE VARIATION



FILL REQUIREMENTS:

EXCAVATE PARKING AREAS AS SHOWN ON DEMOLITION PLANS. REMOVE UNSUITABLE MATERIALS. WITH ENGINEERS AND GEOTECHNICAL APPROVAL, REPLACE WITH FINE AGGREGATE (SEE NOTE 1).

NOTES:

1. FINE AGGREGATE TO HAVE A UNIFORMITY COEFFICIENT OF 1.5 OR GREATER AND AN EFFECTIVE GRAIN SIZE OF 0.2 TO 0.55 MILLIMETERS IN DIAMETER. THE VERTICAL PERMEABILITY RATE (K) IS TO BE 30 FEET/DAY (TYP.). FINE AGGREGATE TO MEET THE REQUIREMENTS OF FDOT SECTION 902-2 OF THE STANDARD SPECIFICATIONS.

2. GEOTEXTILE FABRIC ENVELOPE SHALL BE TYPE D-3 (FDOT INDEX 199) WITH A PERMEABILITY OF 0.7"/SEC AND AN APPARENT OPENING SIZE OF 0.425 MM (#80 SIEVE). ALL GEOTEXTILE FABRIC JOINTS SHOULD OVERLAP A MINIMUM OF 1 FOOT.

3. LOW PERMEABLE SOIL SHOULD HAVE LL > 35, PI < 25, AND PERMEABILITY RATE LESS THAN ONE (1) FOOT PER DAY (3.5'x10 CM/SEC).

4. PERMEABLE INTERLOCKING CONCRETE PAVEMENT SYSTEM SHALL FOLLOW ASTM SPECIFICATIONS FOR ALL GRADING REQUIREMENTS (SIEVE SIZE AND PERCENT PASSING). SEE SPECIFICATIONS AS PROVIDED BY INTERLOCKING CONCRETE PAVEMENT INSTITUTE (ICPI).

NORTH PARKING LOT (ALT. 1 AND ALT. 2 PAVERS)
PERMEABLE PAVEMENT WITH FULL
EXFILTRATION TO SOIL SUBGRADE

INTERLOCKING CONCRETE PAVEMENT INSTITUTE (ICPI) DRAWING NO. 68
N.T.S

North Parking Lot Public Works Employeees installing irrigation and lighting conduits

North Parking Lot fine aggregate layer

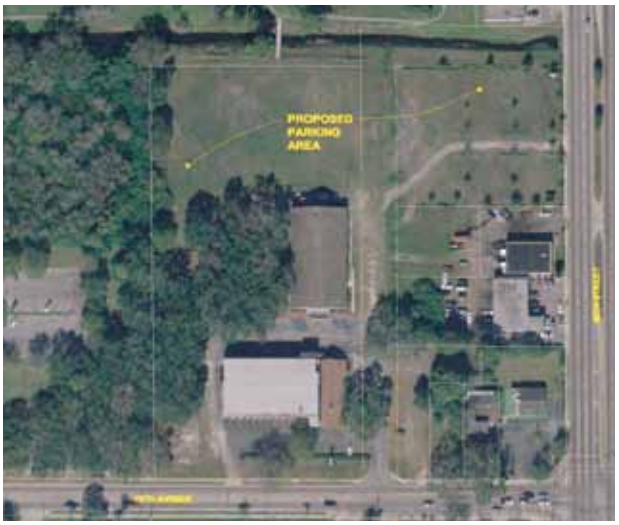
South Parking ribbon curd and 6" vertical curb

North Parking Lot geo-textile fabric layer

North Parking Lot Cross-Section of Materials

South Parking GEO-WEB and pavers

Pinellas Park Performing Arts Center



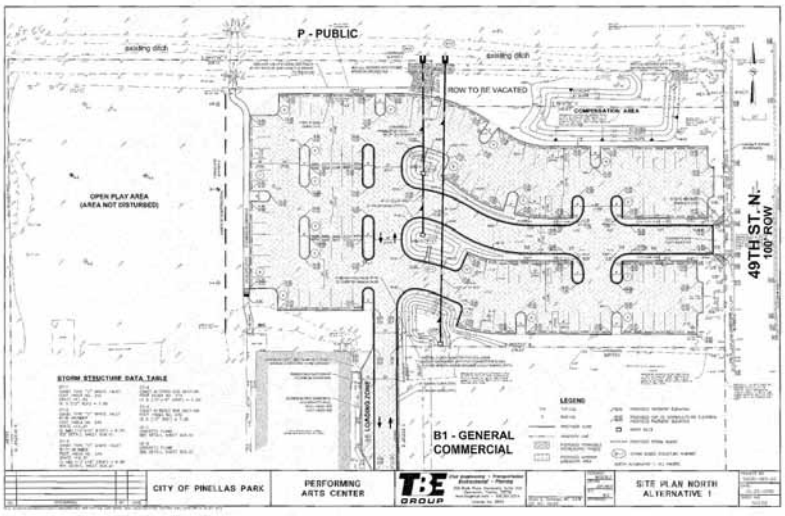
Aerial of site prior to being developed

Aerial of North and South parking lots

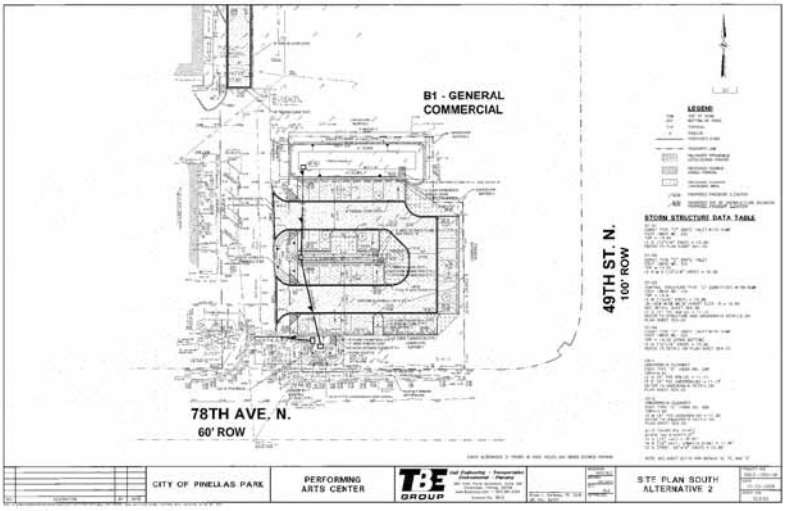
Located in Pinellas County, Florida, the city of Pinellas Park had several goals in mind when they undertook the sizeable project to create a low impact development parking lot for its Performing Arts Center. To accommodate the Arts Center, the Classical Christian School also located on the site, and surrounding businesses, the 2.0 acre site would be transformed into north and south parking lots creating a total of 180 spaces. The north lot, the larger of the two would be designed with 136 spaces, while the smaller parcel would hold 44.

Since the north lot falls within a flood plain, managing storm water runoff was a paramount issue that required careful planning and a durable surface that would be both attractive and designed to retain storm water beneath the surface. The term Low Impact Development (LID) describes a design and engineering plan that successfully reduces storm water runoff. It requires precise engineering, good soil preparation and quality products. In this instance, the plan utilized Belgard's Eco-Holland Stone permeable pavers in the Harvest Blend color, styled after an old world historic brick shape and designed and manufactured to reduce storm water runoff and produce a high level of natural filtration.

A major key to the success of the Eco-Holland Stone permeable pavers in this application is in the careful and thorough preparation of the substrate levels beneath the surface. It begins with the excavation of all unsuitable materials in the parking areas and replacing it with drainable soil to a depth of about one foot. A layer of non-woven geotextile material was installed covering the soil subgrade and extends to the sides of the curbing. Eight inches of #4 stone was placed on top of this material and compacted with a ten ton vibratory roller. This was followed by a 4 inch layer of #57 stone and also compacted. Two inches of #89 aggregate then serves as a bedding course for the Eco-Holland Stone pavers. The 3/16" joints of the permeable pavers are then filled with a fractured DOT joint chip material. Rainfall easily passes through the joints and infiltrates its way into the underlying stone reservoir. This temporarily stores the surface runoff allowing it to slowly percolate directly into the soil below ultimately recharging the aquifer.



North parking lot design



South parking lot design

Aerial of entire site, City Hall, North and South parking lots and Towne Square Park

While the north lot is totally surfaced with Eco-Holland Stone permeable pavers, the smaller south lot employs these pavers for the drive aisle only and parking spaces are on the grass. Water quality treatment for the north lot is provided in the pervious pavement system through dry retention, while in the south lot water quality is realized in the equalized ponds through effluent filtration. An added Belgard benefit of the north lot design is that with the storm water held beneath the pavers, Pinellas Park was able to create a soccer field in the area that otherwise would have been needed for a storm water retention basin.

The entire project lasted approximately three months and a typical work day would see between 5 to 15 men on site. A total of 70,000 square feet of pavers were used and all were hand installed. Belgard's Eco-Holland Stone pavers easily met all structural and storm water management requirements for the city of Pinellas Park, as well as the permitting requirements of the Southwest Florida Water Management District for Storage Volume, Water Quality and Infiltration Rate. Belgard's Eco-Holland Stone permeable pavers are 100% ADA compliant and met the designers' concerns with ladies' high heels.

South Parking Lot open to the public

"Given the challenges our site presented, the City of Pinellas Park is extremely pleased with the results. It has allowed us to maximize the utilization of available land, and has provided community residents with easier and safer access to adjacent recreational areas. The project has also been recognized by the American Public Works Association Florida Chapter for technical innovation and management."

— Dan Hubbard, Project Manager
City of Pinellas Park, Florida

"Due to this project's size and complexity it required the collective effort of many. Considering the site contractor's unfamiliarity with the cutting edge design they executed their scope of the construction without a hitch.

We knew going in that this project would be significant in the development of this type of pavement and we worked diligently to execute our portion of the scope successfully.

Although the installation required us to install the pavers by hand lay due to mold configuration we were able to achieve approximately a 6,000 square feet daily production rate with a crew of eight.

We just wanted to make this project a success and it worked."

— Doug Corey, President
Paver Crafters, Inc.

"I believe we were able to secure and hold this specification by working closely with the engineers during the planning and design stages of this project. By participating in the planning of this parking lot as a stormwater management facility, we were able to address and overcome all of the engineers' concerns regarding the structural requirements, water storage volume and ADA requirements with documented technical data. This gave the engineers a level of confidence that they were working with a company that had the expertise they required."

— Bill Megrath, LEED GA
Oldcastle Coastal

LEED AND BELGARD PERMEABLE PAVING STONE SYSTEMS

The Leadership in Energy and Environmental Design (LEED) program was originally developed for the U.S. Department of Energy. LEED utilizes a point rating system to recognize sustainable site and building design. Many organizations were involved in developing the rating system and certification program. The LEED program is administered by the U.S. Green Building Council **www.usgbc.org**. Currently, many municipal projects that are city owned or city funded are mandating LEED point objectives, while private sector projects are pursuing LEED credit points on a voluntary basis. **Belgard permeable concrete paving stone systems can earn credit points in the LEED rating system**. Please refer to the ICPI (Interlocking Concrete Paver Institute). Tech Spec Number 16 at **www.icpi.org** for a complete description and detailed explanation of LEED credits. LEED credits for new and major renovations earn points from six broad rating categories and of these six, the two primary categories that pertain to permeable concrete paving stones are Sustainable Sites (SS) and Material & Resource (MR).

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