

Case Study

application
location
product

Separation, Drainage, Filtration & Stabilization
Chicago O'Hare International Airport, IL
Mirafi® 170NDA

job owner
engineer
contractor
date of installation

City of Chicago O'Hare
OMP
F.H. Paschen
Summer 2018

TenCate develops and produces materials that function to increase performance, reduce costs and deliver measurable results by working with our customers to provide advanced solutions.

THE CHALLENGE

Chicago's O'Hare International Airport has struggled with flight delays clogging the national airspace for many years. The O'Hare Modernization Program (OMP) was developed to reduce and control these delays. The program consists of reconfiguring the intersecting runways to parallel runways at the airport. The O'Hare airport has not added a runway since 1971. OMP included the following items in the overall plan:

- New runways
- Relocation and extension of existing runways
- 1.5 million sq. ft. new western terminal complex that will be connected to the existing terminals with a new people mover.
- Parking facilities
- Rental car facility
- Employee parking
- Access roads

One of the biggest challenges for this project is the fast pace of construction. In the midwest, construction is not always favorable for year round work. Therefore, when there is good weather during the construction season, it is necessary for everyone to work hard to make things happen. Fortunately, this project has a great team behind it that works together to accomplish this goal.

THE DESIGN

The most unique aspect of this project is the cross section of the sub-base. The asphalt treated permeable base (ATPB) is placed on top of the geotextile, which is covering the clay sub-base. The ATPB is an open graded stone that is glued together with an asphalt oil and lightly rolled. This layer of open graded stone creates the drainage channel which moves the water out of the pavement and to the edge drains.

Geotextiles are a very cost-effective tool in pavement design. They provide separation, confinement, drainage and filtration. When deciding which geotextile to use for this project, the designer considered several factors.



Undercut and backfill with fabric and existing recycled aggregate looking west.



Views of the cross section.



Installation of Mirafi® 170 NDA geotextile.

The main benefits of the geotextile is to provide separation and filtration so that the soil fines don't migrate into the drainage layer, therefore clogging the layer. Next, the water flow rate, grab tensile strength and tear strength were determined. The permittivity of the fabric was crucial for this and TenCate Mirafi® 170 NDA nonwoven geotextile was a perfect match. This geotextile is a nonwoven needle punched geotextile fabric that is extremely strong and easy to install. The material is stocked near the airport project location and job site assistance was readily available, when needed, making the construction process run smoothly.

OMP and F.H. Paschen were committed to quality. Before installation, meetings were held to go over safety concerns, installation procedures, and details of the fabric, such as how to hold it down, minimize wrinkles and fix necessary repairs.

THE CONSTRUCTION

The fabric is located between the stabilized clay base and the ATPB. The installation process is unique in that the fabric has to be driven on by truck traffic in order to install the ATPB material. Care was taken to tack down the fabric on the installation base and then the ATPB was installed over the top of the fabric by using standard asphalt installation equipment.

THE PERFORMANCE

The job owner and contractor are pleased with how the geotextile fabric is performing. The fabric will continue to provide separation, filtration, drainage, and stabilization for years to come. Geotextile use has become very popular over the years to enhance our pavement cross section performance. All of the improvements being performed at the airport will substantially reduce delays, increase capacity and bring new jobs to the area.



Newly constructed parking pad.



Brand new airport employee parking lot.

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