

Project Summary



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Southern Expressway

Allan Block retaining walls have been used in more settings than anyone dreamed possible. Applications continue to come along adding to the system's list of successes. New latest success story comes all the way from "Down Under" in Adelaide, South Australia, where a well-known highway, the Southern expressway, was extended. This extension passes through the rolling landscape of the suburbs of Adelaide. To best utilize the space of the growing countryside, a single retaining wall was built over a two-mile span with heights up to approximately 17 ft (5.2 m).



PROJECT NAME & LOCATION

Southern Expressway,
Adelaide, Australia

PRODUCT

AB Pitched Stones, AB
Pitched Classic

PROJECT SIZE

110,000 AB Units, 2 miles in
length,
14.5 ft (4.4 m) max. height

LOCAL ENGINEER

Connel Wagner

GENERAL CONTRACTOR & WALL BUILDER

Built Environs PTY LTD

ALLAN BLOCK MANUFACTURER

C&M Brick PTY LTD, Victoria
Australia

PLAN

The Southern Expressway itself is a unique highway. Between the hours of 10:00 AM to 3:00 PM, the traffic runs in only one direction, towards the town of Adelaide. During the peak afternoon hours, the direction of traffic flows away from the town to facilitate the traffic returning to residential areas. The construction plans for the expressway called for a two-mile long retaining wall along the north side. This wall was needed to not only retain the parking lot and soil behind it, but also act as a sound barrier. To achieve the desired decrease in sound decibels, the height of the wall needed to be high enough to block the sight line of the neighboring structures. This meant that the wall needed to be as high as 17 ft (5.2 m).

The team at Adbri Masonry proposed the Allan Block system as the best retaining wall product to meet all the requirements and specifications of the project. Allan Block Corporation assisted Adbri Masonry's engineering department in offering immediate and comprehensive support, as well as a design and any revisions they required. An Allan Block representative was also called upon to conduct an on-site-training program for the construction crew, who had no prior experience with the Allan Block product.



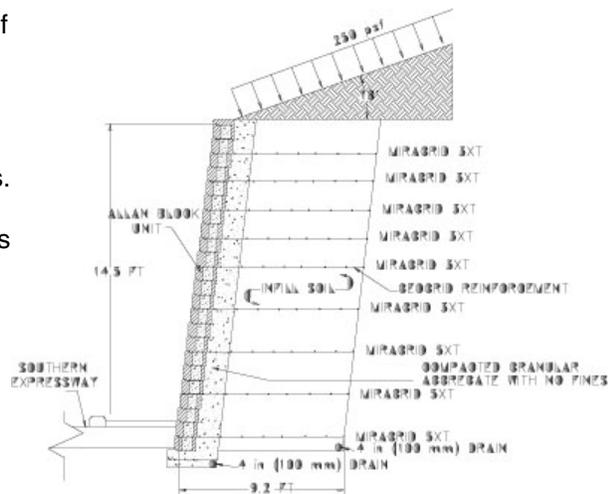
DESIGN

Adbri Masonry's Engineering Department worked with Allan Block and the team at Maccaferri to make the design suitable for the site. The AB Pitched Stones were chosen because they would use less reinforcement than a more-vertical type of block. Due to the setback of the 12-degree system, the retaining wall required more blocks to achieve the desired height for the sound barrier, than a six-degree system. Using the AB Pitched Classic in the sections designed as sound barriers, helped to meet this challenge while still keeping costs reasonable.



Each section of the wall was analyzed for internal and external stability. Some sections of the retaining wall had a slope above as large as a 2:1. In addition to the slope, a surcharge from the parking lot located at the top of the slope and a point load created by the pedestrian bridges going across the highway added more weight to the wall. This weight added more pressure to sections of wall, which meant longer grid lengths were needed in those sections. The wall was further designed to withstand small amounts of seismic force due to the seismic coefficient of 0.1, which is considered minimal for seismic activity.

Due to the multiple loads affecting the wall, two types of geogrid reinforcement were used. The two grid types used in the design were Miragrid 3XT and Miragrid 5XT. In some sections, the base of the wall required stronger reinforcement than the top. The existing site soil is a clay material with a friction angle of 30 degrees. However, during excavation, various soil conditions were encountered such as hind marsh clays, silty sands and stiff clays. This variety of soil conditions required the site's Geotechnical Engineer to evaluate the wall to be sure that its design could accommodate the surrounding environment. The wall was now designed and engineered to have grid lengths ranging from 5 to 17 feet (1.5 to 5.2 m) in length. With the design accomplished, it was time to begin construction.



BUILD

As always on a construction site, time constraints were extremely tight. Adbri Masonry needed to act quickly. They manufactured approximately 110,000 Allan Block units in 19 days. This was no easy task, especially since the blocks are tumbled differently than the methods most commonly used in the United States. With two miles of retaining wall, the owner wanted to have a product that would be timeless in appearance. The feeling was the straight split face or a three-way split face would soon be out dated on a wall that was projected to have a 75-100 year life cycle. With this in mind, Adbri Masonry took the AB Stones and Classic to another level, giving them a carved look by pitching the block. Noticeable in the photos, the pitched face gives the block a natural stone look.

Once this process was complete, the blocks were transported to Adelaide. Proper grading of the site was done to direct water away from the wall and help manage surface drainage to prevent erosion. The foundation was then prepared by laying the base course, and installing the drainpipe. The wall was then built on grade, providing yet another unique aspect to this project. This simplified installation process minimized time and costs to the client. The retaining wall was built at an amazing rate of 2,153 ft² (200 m²) per day by a group of 12 people, with no prior experience. The Southern Expressway of Adelaide South Australia was completed flawlessly, giving us another great success story for Allan Block Retaining Walls.

