Allan Block Wall Combines with Natural Stone to Create Beautiful Waterfall

Every so often an Allan Block wall is constructed that extends beyond creating additional usable space. This project, in Livingston, NJ, is definitely one such application. The ParkVue at Livingston project incorporates an Allan Block retaining wall system with natural stone for a striking transition that surrounding wildlife can enjoy along with a newly constructed apartment complex. The natural stone divides two sets of tiered Allan Block walls and allows water from above to flow freely into the pond below, creating a man-made waterfall. The stones themselves were actually found on site and re-purposed for this application. Coupled with natural vegetation on top of each wall terrace, the structure blends seamlessly into the environment.

Project Information

Name: ParkVue at Livingston

Product: AB Classic

Size: 25,000 ft² (2,300 m²)

Wall Designer: Geller Sive LLC

Wall Builder: James R. Ientile, Inc.

Allan Block Manufacturer: Clayton Block

Plan

ParkVue at Livingston is a large luxury rental community located just west of Newark, NJ and subsequently, New York, NY. During planning for the project, the owners, Squiretown Properties, wanted to make sure that every aspect of the property went above and beyond in terms of aesthetics. As part of the demand for a beautiful looking community, Squiretown Properties requested that the subcontractor, James R. Ientile, provide a main focal point at the entrance of the property in the form of a 25 ft (8 m) tall waterfall that tied into the grade-change solution for the site. Thanks to its versatility and proven track-record the AB Certified Contractors at James R. Ientile, would be installing Allan Block Classic retaining wall blocks in an earthblend color that would beautifully accent the designed water fall.

The waterfall was not the only aspect of the site that would require the wall to be carefully planned out. In addition to the wall tying into the natural stone waterfall, there were two specific conditions that needed to be addressed. First, there would be a lake at the base of the wall that the design would need to accommodate. Second, terraced walls would be designed and constructed to overcome the 25 ft (8 m) grade change and meet the aesthetic demand of the owner.

Thanks to the early and in-depth planning of the project, these normally troublesome site conditions and requirements were addressed and handled in a way that minimized stress later on in the project.

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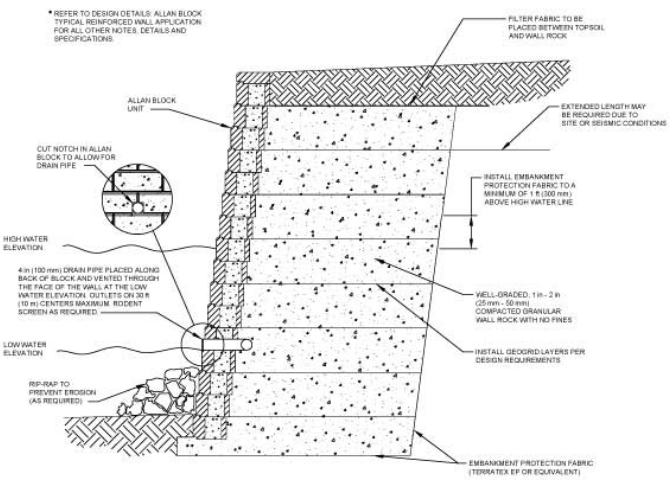
Design

Because of the complexity of the retaining walls on site, hiring a highly qualified engineer with retaining wall experience was a top priority. Robert Sive from Geller Sive and Company out of Farmingdale, NJ, was hired on as the designing engineer thanks to his wall design experience. A 25 ft (8 m) tall waterfall running between two terraced retaining walls and water applications are each complex applications on their own, but for this project, Robert needed to design for all three.

When it comes to designing around a waterfall, there are a few very important things to consider. The most important thing to consider is that retaining walls and water have a very complex relationship that needs to be paid close attention to, especially when that water is flowing. If water makes its way behind the retaining wall and rises within the reinforced or retained soil zones, hydrostatic pressure can build up and increase the force on the back of the wall facing. If this force gets too high, there is a possibility that the wall could fail. Also, having running water interact with the retaining walls can cause some issues. If water can freely flow down the face of the wall, it can eventually erode the toe of the wall. Because of these two factors, it was important for the waterfall and walls to be designed in a way that would keep water away from the walls. It was also important to make sure that there was proper drainage behind the retaining walls. The solution here was to design the waterfall as a separate structure that focused on routing the water towards the middle of the waterfall rather than the outsides where the retaining walls were. The waterfall was also designed wide enough to allow the placement of extra boulders to act as a safety buffer between the main path of the water and the retaining walls.



One benefit to this location was that the site soils consisted of sandy glacial till which allowed the use of existing soils, mixed with pulverized material from other areas of the site, in the infill area behind the wall facing. The free-draining property of this soil coupled with toe and heel drains, which were installed behind the wall, will allow it to handle any incidental water that makes its way behind the wall facing in accordance with Chapter 3 of the Best Practices for SRW Walls.

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Another chapter of Best Practices that was addressed in the design of the ParkVue project was Chapter 10: Global Stability – Terraced Walls. With terraced walls approaching a total height of 25 ft (8 m), it is extremely important to design them with Best Practices in mind. Chapter 10 states that bottom terraces should have grid length equal to at least 60% of the total terraced structure height. This ensures that the bottom terrace is able to support the forces exerted on it from the terraces above. In addition to the extended grid lengths, Best Practices also states that terraced applications are more susceptible to global stability failures, so it is important to make sure that global stability is checked for these applications.

The last major design consideration that Robert had to design for was that there was to be a small pond below the walls that the waterfall could flow into. Because of this pond, all of the lower walls had to be engineered to properly handle water moving through the retained soil that exceeded incidental groundwater. To accomplish this, Chapter 5 of Best Practices can be referenced. Chapter 5 states that if a wall is constructed to be a water application, the wall rock should be placed to the limits of the geogrid length up to a height of 1 ft (0.3 m) above the high-water mark, or in the whole infill zone. The detail above shows how one of the water application walls was designed for the project. The drain pipe should also be raised to the low water elevation to help with the draining of water from the reinforced zone of the wall.

Build

James R. Ientile, Inc was contracted by Squiretown Properties for all site work improvements at ParkVue. Besides the 25,000 ft^2 (2300 m^2) of Allan Block retaining walls on site, James R. Ientile was also responsible for constructing the 25 ft (8 m) waterfall. Fortunately, as we mentioned above, they were able to source all of the boulders used in the waterfall from the site. When it comes to the retaining walls, Allan Block Classic block was used with geogrid placed on every other course. Wall Rock was used to fill the blocks and an engineered backfill including a mixture of 0.75 in. (19mm) rock with the fill from the site was used behind the walls. One of the bigger challenges that needed to be addressed was how the retaining walls would be tied into the waterfall without looking unnatural. To accomplish this, any blocks neighboring boulders were altered to fit the shape of the waterfall. On projects like ParkVue at Livingston where aesthetics are so important, having highly qualified and trained wall installers on the job is extremely important. Thanks to the amazing installation work of James R. Ientile, Inc, the retaining walls on site add to the beauty of ParkVue at Livingston.

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