EXECUTIVE SUMMARY

THIS PROJECT IS ABOUT TRANSFORMATION AND RENEWAL. Dunbar, as the first African-American High School in the country, has a tremendous legacy and hundreds of remarkably accomplished alumni – eight are featured on US Postage stamps, more than any other school. But decades of accomplishment have been followed by years of under-performance. As the City sought to replace the obsolete Brutalist 1977 building the school occupied, the Dunbar Alumni Federation joined with the school, the Department of General Services (DGS) and the DC Public Schools (DCPS), to establish a vision that would:

- Restructure the school academically
- Create a high-performance building to support the restructured program
- Re-engage the school into the Truxton Circle community

DATA SHEET / KEY STATS

Project Name: Dunbar Senior High School
Project City/State: Washington, DC
School Category: Senior High School
Grades Served: 9-12
Capacity: 1,100
Size of Site: 8.5 acres
Gross Area of Building: 280,000 gsf
Volume of Building: 4,475,000 cu. ft.
Space per Student: 236 sf/student
Cost per Student: $110,909/student
Square Foot Cost: $363
Cost of Construction: $101,750,000
Total Project Cost: $127,906,735
Contract Date: January 2011
Date Construction Started: November 2011
Date Construction Completed: August 2013
Sustainability Rating System Applied: LEED
Status of Sustainability Certification: Certification Pending
Sustainability Certification Level: Pending LEED Platinum
COMMUNITY ENGAGEMENT PROCESS

“WE CAN CERTAINLY MOVE FORWARD AND HAVE OUR CHILDREN COME OUT WITH A SENSE OF PRIDE.”

– Bettie Brooks Cole, ’61
COMMUNITY ENGAGEMENT PROCESS

STAKEHOLDERS.
Representing generations of successful graduates, the Alumni Federation, the school and DGS/DCPS created a process that began with a design competition and established a School Improvement Team (SIT) with broad representation by faculty, students, administrators, alumni, Advisory Neighborhood Commissioners and neighbors to work closely with the design team throughout the fast-paced, 34-month design and construction process.

Representing recent graduates to octogenarians the Alumni Federation actively engaged the design team from the very beginning when several sat for interviews discussing the history and heritage of the school and their personal vision for the future. Inspired by the shared vision of the alumni, the design team established an initial concept for the school. At a mid-point in the competition, the design team presented the work and based upon the feedback, dramatically revised the concept reducing its footprint, stacking the building vertically and strengthening the idea of that the historic heart of the school’s 1917 building, the armory, would inspire the heart of the new building. The shared vision was that the new building honor the school’s tremendous history and tradition but that it should also catalyze the recreation of the school for the future.

Many yearbook photos took advantage of the grand entrance to the 1917 building.
COMMUNITY ENGAGEMENT PROCESS

Workshops following the selection of the design team and the concept, drilled down into every aspect of the design with the SIT, and through surveys with the larger Dunbar community, including:

- Relocation of the building to the east side of campus where the historic 1917 building had been located
- Programming and organization of the four new academies
- Zoning of the building to accommodate active community use
- Creation of the Armory as the “Heart of the School”
- Relationship of major program elements to activate the Heart: food, media center, academies
- The creation of a food court within the Armory rather than an institutional cafeteria
- Security measures that respected the idea that openness and transparency helps to build a stronger learning community
- Reopening of O Street NW, reengaging Dunbar with the community

The new school will also function as a community center, available for use when school is not in session. The design allows for the classroom and office components to be secured during off hours, allowing active community use of the gym, pool, theater, media center and Armory.
The Design Team engaged members of the community to discuss the sustainable aspects of the LEED Platinum building.

(See the signs later in this submittal.)
<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abigail Cronin</td>
<td>Architect</td>
</tr>
<tr>
<td>Annetta Nicholas</td>
<td>Bates Civic Association</td>
</tr>
<tr>
<td>Anthony Deguzman</td>
<td>Chancellor Henderson's Representative</td>
</tr>
<tr>
<td>Craig English</td>
<td>DCPS - Department of Career And Technical Education</td>
</tr>
<tr>
<td>Chrystal Stowe</td>
<td>Smoot/Gilbane Joint Venture</td>
</tr>
<tr>
<td>Cynthia Jones</td>
<td>Dunbar Teacher</td>
</tr>
<tr>
<td>David Shirey</td>
<td>Architect</td>
</tr>
<tr>
<td>Darrell Pressley</td>
<td>Department of General Services</td>
</tr>
<tr>
<td>Don Denman</td>
<td>Department of General Services</td>
</tr>
<tr>
<td>Kathleen Davis</td>
<td>Resident on P St.</td>
</tr>
<tr>
<td>Esmond Jardine</td>
<td>Dunbar JROTC</td>
</tr>
<tr>
<td>Gregory Benson</td>
<td>Department of General Service</td>
</tr>
<tr>
<td>Geovani A. Bonilla</td>
<td>Hospice management</td>
</tr>
<tr>
<td>Ibrahim Mumin</td>
<td>Muslim Mosque #4</td>
</tr>
<tr>
<td>Jackie Stanley</td>
<td>Department of General Services</td>
</tr>
<tr>
<td>Joyce Robinson Paul</td>
<td>Advisory Neighborhood Commission, 5E04</td>
</tr>
<tr>
<td>Josh Christensen,</td>
<td>Smoot/Gilbane Joint Venture</td>
</tr>
<tr>
<td>Johnnie Walker</td>
<td>Dunbar HS Athletic Director</td>
</tr>
<tr>
<td>Joe Smith</td>
<td>Smoot/Gilbane Joint Venture</td>
</tr>
<tr>
<td>Kenneth Diggs</td>
<td>Department of General Services</td>
</tr>
<tr>
<td>Linda Graves</td>
<td>Smoot/Gilbane Joint Venture</td>
</tr>
<tr>
<td>Matt Bell</td>
<td>Architect</td>
</tr>
<tr>
<td>Marc Bleyer</td>
<td>Office of Citizen Complaint Review</td>
</tr>
<tr>
<td>Margaret Stevens</td>
<td>Bates Area Resident</td>
</tr>
<tr>
<td>Michelle Chin</td>
<td>Department of General Services</td>
</tr>
<tr>
<td>Merle Thorpe</td>
<td>Advisory Neighborhood Commission</td>
</tr>
<tr>
<td>Morrall Thompson</td>
<td>Dunbar HS Assistant Principal</td>
</tr>
<tr>
<td>Carrie L. Thornhill</td>
<td>Dunbar Alumni Federation Rep</td>
</tr>
<tr>
<td>Jennifer Ragins</td>
<td>Bates Area Resident</td>
</tr>
<tr>
<td>Chelsea Rock</td>
<td>Office of the Chief Operating Officer - DCPS</td>
</tr>
<tr>
<td>Deanna Newman</td>
<td>Department of General Services</td>
</tr>
<tr>
<td>Rachelle Nigro</td>
<td>ANC - C6E</td>
</tr>
<tr>
<td>Patrice Billingsley</td>
<td>Dunbar HS Athletic Trainer</td>
</tr>
<tr>
<td>Sean O’ Donnell</td>
<td>Architect</td>
</tr>
<tr>
<td>Ruth Jenkins,</td>
<td>Department of General Service</td>
</tr>
<tr>
<td>Sylvia Pinkney</td>
<td>Advisory Neighborhood Commission, 5E05</td>
</tr>
<tr>
<td>Stephen Jackson</td>
<td>Dunbar Principal &amp; SIT Chair</td>
</tr>
<tr>
<td>Tomeka McKenzie</td>
<td>Dunbar HS - Assistant Principal</td>
</tr>
<tr>
<td>Wesley Harvey</td>
<td>CAPCS - Director, Operations &amp; Finance</td>
</tr>
<tr>
<td>Willa Renee B. Wallace</td>
<td>Dunbar HS Staff</td>
</tr>
</tbody>
</table>
The original 1917 Dunbar High School building asserted a civic presence in the local neighborhood and demonstrated a scale of elements that related well to the adjacent row house fabric. The building was characterized by a unique skyline, bay windows, and a clear sense of base-middle and top.

The building constructed to replace the 1917 building was placed in the right-of-way of a historic street and was inwardly focused with few windows and minimal natural light. The entry to this building faced north and the building was commonly referred to as a “prison” because of its lack of natural light.

The new entry opens to the community, faces south, and allows for generous amounts of natural light to enter the facility. Broad steps suggest a civic scale and welcome students, staff, and visitors into the school.
Note the way in which the school in 1917 was located to define the city grid and how the axial alignment of the school, with the sports field and track, binds the two together in a larger ensemble.

The 1977 building cut off an existing historic street and was comprised of inward looking “pods” with little connection to the neighborhood.

The new design seeks to define the streets and blocks of the city fabric on all sides and relates the complex to the scale of the row house fabric.
A SITE STRATEGY THAT ENHANCES THE NEIGHBORHOOD

The parti diagram for the project shows the connection to the existing park to the south, the alignment/connection to the field to the west, and the opening up of the historic street to the north. In addition, a new development site is created north of the historic street that will offer home ownership opportunities to new neighborhood residents.
COMMUNITY ENGAGEMENT PROCESS

The reopening of O Street, NW, a street mapped in the District’s historic L’Enfant Plan, was another element of the design entirely inspired by the stakeholders to the process. O Street was closed by the school’s 1977 building and that action cut off two sides of the Truxton Circle neighborhood. Relocating the new building to the footprint of the school’s 1917 building enabled the street to be reopened as a model sustainable street, literally reconnecting the community. O Street and the new openness of the building to the neighborhood, in contrast to the foreboding presence of the 1977 building, have catalyzed the revitalization of the surrounding neighborhood.

The Green’O’vation project will demonstrate the multiple benefits of Low Impact Development (LID), including flood reduction and water quality improvements.

DID YOU KNOW THAT...

- 6,152 square feet of bioretention cells, or “rain gardens,” will be provided along O Street.
- 39 new street trees and 900 shrubs will be planted in these rain gardens.
- Stormwater runoff from the sidewalks and roadway will be collected in the cells and filtered through the plant media before being reintroduced back into the storm system.
- By holding the water on site in a storm event and reintroducing it back into the system slowly, localized flooding will be prevented.
- O Street will be used as a teaching tool for both environmental science and sustainability.
EDUCATIONAL / PHYSICAL ENVIRONMENT

"IT JUST DOES MY HEART SO MUCH GOOD TO SEE SUCH A BEAUTIFUL BUILDING."

– Therrell C. Smith, ‘35
The school has reorganized into four academies: an innovative 9th grade academy designed to ensure student retention, and mixed-grade STEM, Education & Information Technology and Business academies. Each academy resides on its own floor in the academic wing and features offices for the Assistant Principal leading the academy, counselors, classrooms and labs tailored to the program, a teacher workroom and “extended learning” spaces. Openness and transparency throughout encourage active engagement of students, faculty and staff.
“THIS NEW DUNBAR ALSO REMINDS STUDENTS OF WHAT THEY CAN BE.”
– Erica Hill, Today Show Co-anchor
200 stainless steel plaques are embedded in the floor and walls. One hundred celebrate an accomplished Dunbar graduate or educator. One hundred are blank, inspiring the current generation to aspire to continue the legacy.
THE EIGHT ALUMNI AND FACULTY FEATURED ON THE U.S. POSTAGE STAMPS ARE CELEBRATED ON THE MEDIA CENTER WALLS.

Providing places for individual reflective work, large group meetings, instruction, and small group, collaborative work, the space has accommodated individuals, classes as well as meetings of the Alumni Federation and NGO and governmental committees.

An expanse of glazing permits users to overlook the adjacent recreation center and park, and for passersby to see an artist’s interpretation of the eight US Postage stamps featuring distinguished graduates and educators of Dunbar (left).
With gracious views over the entrance, the Armory and the neighboring park and recreation center, the Senior Lounge provides the older students with their own place to casually meet in a collegiate-style setting.
A 600-seat theater was designed to encourage young performers, by providing an acoustically tuned, intimate setting that can accommodate a variety of performance and media.
The sustainable goals of the project were to create a truly high performance learning environment that would support the transformation of the school’s academic program, enhance the energy performance of the school within the larger DCPS inventory, help mitigate chronic local flooding during storm events, and educate the next generation of environmental stewards.

The first goal was achieved by coordinating the many systems that result in a supportive educational environment:

- Natural and electric light,
- Acoustics,
- Thermal comfort,
- Indoor air quality,
- Color,
- Furniture and space.

These priorities drove design from the initial organizational strategies on the site, where the academic wing housing most of the classrooms and labs was oriented east-west resulting in our ability to more easily control natural light and glare in the north and south facing instructional spaces. As design developed, a focus on enhanced acoustics – in contrast to the raucous, open plan environment in the 1977 building – influenced wall construction, window and door assemblies, floor and ceiling specifications and even the location of ground source heat pumps and other HVAC equipment relative to the instructional space.
A ground-source heat pump system (also known as a geothermal system) under the athletic field and radiant flooring in the Armory support Dunbar’s commitment to energy efficiency.

The building exterior, or “envelope,” is like your skin—it protects you from sun, wind, rain, and snow. The envelope is designed to allow natural light and fresh air into the building, while keeping excess heat and cold out.

Low-emitting, recycled, and regional materials, green housekeeping, and pervasive daylighting and views enhance the quality of the interior environment.

Solar panels, also known as photovoltaic (PV) panels, convert natural energy from the sun into clean, reliable electricity.

Rainwater collection and water-efficient fixtures reduce demand for fresh water and help retain stormwater runoff.
In addition to the building’s pervasive natural light, the building sought to maximize energy performance in innovative ways by integrating as many systems into the “geothermal” system – the largest to date constructed in DC – including the pool and kitchen equipment and the radiant floor system in the “Armory,” the heart of the school.

A ground-source heat pump system (also known as a geothermal system) under the athletic field and radiant flooring in the Armory support Dunbar’s commitment to energy efficiency.

Geothermal wells take advantage of the earth’s constant year-round temperature of 59°F. Water is pumped through pipes that are buried underground. In the summer, the water absorbs excess heat from the building’s mechanical system, then transfers that heat into the ground. In the winter, the opposite happens: the water draws heat from the ground to provide pre-warmed air and water to the heating system of the building. This system reduces the building’s demand for energy from fossil fuels.

Radiant flooring in the Armory improves thermal comfort of occupied areas near the glass in the winter by warming the space from below. Because fans and air ducts are not needed for radiant flooring, the system is silent and efficient. Independent east and west loops allow the occupants to control the amount of heat throughout the day.

362 wells are buried under the track and field to a depth of 500 feet.

$250,000 - $300,000 Estimated annual energy cost savings when compared to average DC schools.

In all, the system has more than 68 miles of tubing, longer than the Capital Beltway!
Enhancing energy performance began with proper siting and orientation of the building. Passive strategies including shading devices and walls and roofs with high R-values contribute to reducing energy consumption.

The building exterior, or “envelope,” is like your skin – it protects you from sun, wind, rain, and snow. The envelope is designed to allow ample natural light into the building while keeping excess heat and cold out.

DID YOU KNOW THAT...

1. East-west building orientation (5%) + passive solar design (10%) can produce up to 15% energy savings.

2. The building’s facade is not only decorative, but also performs vital functions throughout the day.

The climate zone has important implications for the design of the exterior. In a temperate and humid climate, creating waterproof and thermal barriers between the inside and outside of the building helps keep the interior air comfortable and prevents water damage from humidity and condensation.

U.S. Climate Zone

R-Value
A measure of a material’s resistance to the passage of heat. R-value is used to describe the different types of insulation used in buildings. The higher the number, the better the building insulation’s effectiveness.

<table>
<thead>
<tr>
<th>Material</th>
<th>Existing Durban HS</th>
<th>New Durban HS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walls</td>
<td>Up to 6</td>
<td>Up to 27</td>
</tr>
<tr>
<td>Roof</td>
<td>Up to 15</td>
<td>Average 43</td>
</tr>
</tbody>
</table>

OUTSIDE

- **BRICK VENNER**: Finished “skin” of building. Traditional Midwestern building material
- **WALL CAVITY**: Space between inside wall and outside wall (thermal break)
- **INSULATION**: Any insulating material that reduces heat flow or air flow
- **3½” SPRAY FOAM INSULATION**: Helps keep living environment comfortable in hot or cold weather. Blocks wind and vapor from entering living spaces.
- **DUAL-GLAZED WINDOW**: Two panes of glass separated by an air space filled with inert gas to reduce heat transfer. Allows 70% of visible light to enter. Blocks 60% of solar radiation (prevents sun damage skin and eyes)
- **SHEATHING**: Strong, tough material. Base for insulation and weatherproofing
- **STEEL STUDS + 1½” SPRAY INSULATION**: Structural support for wall. Insulation helps keep inside air warm or cool, depending on season
- **STYROFOAM INSULATION**: Attached wall at masonry. Base for paint and other finishes

INSIDE
INTERIOR

Critical to the creation of a high performance learning environment, the design emphasized daylight, views, enhanced acoustics, indoor air quality, and thermal comfort.

Low-emitting, recycled and regional materials, green housekeeping, and pervasive daylighting and views enhance the quality of the interior environment.

DID YOU KNOW THAT...

- Natural light is provided to over 90% of the classrooms.
- Natural daylighting has been directly linked to enhanced achievement in the classroom.

Abundant natural light fills the atrium, enhancing the interior environment and conserving energy.

Full-height walls, absorbent ceiling assemblies, and strategic placement of HVAC equipment improve the acoustics of the classroom.

Sensors automatically turn off lights when there is adequate daylight and the room is unoccupied.

Daylighting and views promote a strong connection to the gym and the field.

Wood used in the building means the Forest Stewardship Council (FSC) criteria for sustainable forestry.
SOLAR

Requiring legislative action by the City Council, the school also features a 482 kW photovoltaic array provided through the District’s first Power Purchase Agreement, clearing the path for subsequent DC projects to make use of this precedent.

The new Dunbar will have these three different types of solar panels on the roof. Solar panels must be oriented south to maximize efficiency.

- Trellis mounted south facing 5° slope
- Thin film 0° slope
- Roof ballasted south facing 5° slope

The sun’s path changes with the seasons. The building is oriented on the east-west axis, with the longer sides facing north and south, to capture natural light throughout the day. In winter, the low sun warms the building, reducing load on the heating system. In summer, the high sun is blocked by overhangs and other shading devices.

Solar panels, also known as photovoltaic (PV) panels, convert natural energy from the sun into clean, reliable electricity.

**DID YOU KNOW THAT...**

- On-site power generation accounts for 14% electricity savings.
- On average, DC has 202 sunny days per year, 4.2 hours of sun per day.
- Solar power gathered on a sunny summer day is strong enough to light all 56 classrooms and a surplus of 4 classrooms for 8 hours!
WATER USE

Each of these systems come together within the school’s aspiration to engage the building as a teaching tool. Pre-Engineering classes participated in the design and construction process and are now poised to integrate the building and its systems into their curriculum. The students are also training to lead the tours of their LEED platinum building, sharing what they have learned with peers and visitors.

These graphics were created as part of the education process and, at full-4’ by 4’ size, they hung as banners on the construction fence to help inform the public about the features of their new LEED Platinum school.

Rainwater collection and water efficient fixtures reduce demand for fresh water and help retain storm water runoff.

DID YOU KNOW THAT...

- Water reduction measures decrease water usage by 50%.
- Saving 1,400,000 gallons per year compared to a typical high school.
- Approximately 486 million gallons of water is used daily in the Washington DC area. Each person uses about 80-100 gallons per day.

There are two 20,000 gallon cisterns adjacent to the building. Each cistern is equal to the size of a school bus!

There is a network of stormwater pipes that direct rainwater to the cisterns. Rainwater harvested from the roof and site will be stored in the cisterns to be filtered and reused for flushing toilets throughout the building.
By reopening a public street right-of-way closed by the 1977 building, the project also helps to connect the neighborhood and mitigate chronic storm water issues in the community. Complementing the two 20,000 gallon cisterns receiving water from the building’s roofs, the reopened O Street will feature 6,152 sf of rain gardens arrayed along both sides of its length able to handle a 1.2 inch storm event, creating a model of low impact development (LID) for the school, the Truxton Circle neighborhood, and the city.

**DID YOU KNOW THAT...**

- O Street rain gardens will retain 1.2 inches of runoff from ~1.2 acres of drainage area.
- 1.2-inch rain event is equivalent to the 90th percentile storm in the District.
- Each bioretention cell has been designed to accommodate up to 12 inches of ponding.
- Total volume of retained water via infiltration and evapotranspiration ~45,000 gallons.

The Green’O’vation project will demonstrate the multiple benefits of Low Impact Development (LID), including flood reduction and water quality improvements.
FLOOR PLANS

SECTION A-A

1. ENTRY
2. VESTIBULE
3. ARMORY
4. GRAND STAIR
5. POOL
6. CHORAL ROOM
7. AUDITORIUM
8. FOOD COURT
9. WELCOME CENTER
10. MUSEUM
11. TEACHERS’ WORKROOM
12. OFFICE
13. SPECIAL NEEDS CLASSROOM
14. CLASSROOM
15. EXTENDED LEARNING
16. LABS
17. SENIOR LOUNGE
18. MEDIA ROOM/READING
19. GYM
20. BRIDGE
21. BAND ROOM
22. ART ROOM

SECOND FLOOR

THIRD FLOOR

FOURTH FLOOR

FIRST FLOOR
“IT MAKES PEOPLE FEEL LIKE THEY NEED A BRAND NEW ATTITUDE TO COME INTO THE BUILDING”

– M. Patterson, Class of 2014
The project has focused the Dunbar community – the students, the administration and faculty, the alumni, the Truxton Circle neighborhood, and the District – on the future. The new building provides high performance, 21st Century learning environments, repairs the urban fabric and builds community.

While the post occupancy analyses have not yet been performed, anecdotally, the students, faculty, administrators and alumni report that the building is living up to their aspirations and vision. The new academy structure is projected to retain 90% of the 9th graders entering the school. This is contrast to the 60% retention rate previously experienced by the school and the district.
RESULTS

HOWARD GALA AT DUNBAR

The Armory, like its predecessor, is hosting school and community gatherings. In celebration of its 125th anniversary, the Howard University School of Education hosted an inaugural gala in the Armory of the new Paul Laurence Dunbar High School building in Washington, D.C., on Thursday, Oct. 24, 2013.

Hundreds of national and local luminaries who support the School of Education’s mission to prepare students and eliminate education and social disparities attended.
The Armory has played host to a variety of celebrations from the week-long ribbon cutting ceremonies to Howard University’s homecoming gala and it truly has become the heart of the school. Alison Stewart, author of First Class, the Legacy of Dunbar, America’s First Black Public High School (2013), wrote that the design conveys a sense of “real romance.”

Mayor Grey, a 1959 graduate, calls the new building - in contrast to its predecessor – “aesthetically pleasing, with a dignified look.” Teachers enthuse about the natural light and the acoustics. For his part, Principal Jackson predicts: “The students definitely will do better in this building!”

To see and hear the students, and alumni discuss the new building, please click on the image to see the recent Today Show feature:

“THE BUILDING HAS LIGHT, ENERGY AND LIFE!
I LOVE IT, I LOVE IT, I LOVE IT!”
– Principal Jackson