

D.C. UNITEDTM STADIUM



SECTION

09

ENVIRONMENTAL
BENEFITS

LEED

- 9.01 ENVIRONMENTAL BENEFITS NARRATIVE
- 9.02 LEED GOLD SCORECARD
- 9.03 GREEN ROOF & PV PANELS RENDERING
- 9.05 SUSTAINABLE MATERIALS RENDERING

ENVIRONMENTAL BENEFITS

The D.C. United Stadium is pursuing Leadership in Energy and Environmental Design (LEED) Gold Certification. The project team will implement an integrated design approach in order to maximize LEED credit achievement. Key project stakeholders and design and construction team members will be involved in the LEED process beginning in project planning and schematic design phases and will remain engaged through the certification process. The integrated team will address elements of the building's design from multiple angles including aesthetic, architectural, functional, high-performing systems, cost, operations, and sustainability. The project team will hold LEED specific integrated design coordination meetings throughout design and construction.

The project team will prioritize through design and specifications the following sustainability targets:

- Reduce development impact through site measures.
 - Address how the project site, which is infill, will be affected by a number of simultaneous developments and existing infrastructure, community services and public transportation options.
 - Implement site stormwater management through use of infiltration basin.
 - Reduce heat island effect through specification of highly reflective roofing material and areas of extensive to semi-intensive (by depth) green roof.
 - Reduce heat island effect through specification of highly reflective site paving materials.
 - Demonstrate reduction in potable water use for landscape irrigation. Project goal (50% reduction over baseline) will be

pursued through native and adaptive plant species selection. The project team will consider strategies to eliminate potable water use for landscape irrigation (to achieve 100% reduction).

- Demonstrate indoor water use reduction over baseline. Project goal (40%) will be pursued through low-flow plumbing fixtures and waterless urinals.
- Demonstrate savings on energy cost improvements against baseline via ASHRAE 90.1-2007 energy simulation. Project goal (20%) will be pursued through:
 - Optimized building envelope and associated assemblies
 - Energy efficient HVAC systems: high efficiency split system units (VRF), high efficiency boilers
 - Energy efficient lighting systems: LED building lighting, LED sports lighting, lighting control system
 - On-site renewable energy: PV panels (project goal of 3500 sf) at entrance canopies
- Specify building materials that demonstrate responsible practices. These materials may:
 - Contain recycled content (project goal 20% by cost)
 - Be regionally manufactured and extracted (project goal 20% by cost)
 - Be certified by the Forest Stewardship Council (project goal 50% or 95% of new wood products by cost)

- Provide enhanced indoor environmental quality to building users and visitors through:
 - Specification of building materials that are low- or no-emitting
 - Exceeding ASHRAE 62.1-2004 ventilation requirements (project goal greater than 30%)
 - Providing optimal thermal comfort by designing HVAC system to meet requirements of ASHRAE 55-2004
- Incorporating innovative solutions to promote the concepts of sustainability and wellness in the built environment to building visitors and users through green education, active use of the building, and sustainable operations and maintenance strategies.

LEED credits deemed appropriate for the project that may carry additional cost will be evaluated by the project team. The design team and the construction manager/general contractor will coordinate to generate a rough order of magnitude estimate. Where applicable, a return on investment estimate may also be provided to the Owner for consideration to determine the payback period of a particular strategy.

LEED is a process that is most successful when each team member is dedicated not only to the resulting LEED Certification but to the larger goal of developing an energy efficient, high-performing building that benefits its owners and occupants throughout its lifetime.



LEED 2009 for New Construction and Major Renovations

Project Checklist

17 8 1 Sustainable Sites Possible Points: 26

Y	?	N			
Y			Prereq 1	Construction Activity Pollution Prevention	
1			Credit 1	Site Selection	1
5			Credit 2	Development Density and Community Connectivity	5
1			Credit 3	Brownfield Redevelopment	1
	6		Credit 4.1	Alternative Transportation—Public Transportation Access	6
1			Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1
3			Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3
2			Credit 4.4	Alternative Transportation—Parking Capacity	2
		1	Credit 5.1	Site Development—Protect or Restore Habitat	1
		1	Credit 5.2	Site Development—Maximize Open Space	1
1			Credit 6.1	Stormwater Design—Quantity Control	1
1			Credit 6.2	Stormwater Design—Quality Control	1
1			Credit 7.1	Heat Island Effect—Non-roof	1
1			Credit 7.2	Heat Island Effect—Roof	1
		1	Credit 8	Light Pollution Reduction	1

8 2 Water Efficiency Possible Points: 10

Y	?	N			
Y			Prereq 1	Water Use Reduction—20% Reduction	
4			Credit 1	Water Efficient Landscaping	2 to 4
	2		Credit 2	Innovative Wastewater Technologies	2
4			Credit 3	Water Use Reduction	2 to 4

11 15 9 Energy and Atmosphere Possible Points: 35

Y	?	N			
Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
6	4	9	Credit 1	Optimize Energy Performance	1 to 19
	7		Credit 2	On-Site Renewable Energy	1 to 7
2			Credit 3	Enhanced Commissioning	2
	2		Credit 4	Enhanced Refrigerant Management	2
1	2		Credit 5	Measurement and Verification	3
2			Credit 6	Green Power	2

7 7 Materials and Resources Possible Points: 14

Y	?	N			
Y			Prereq 1	Storage and Collection of Recyclables	
		3	Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3
		1	Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1
2			Credit 2	Construction Waste Management	1 to 2
		2	Credit 3	Materials Reuse	1 to 2

Materials and Resources, Continued

Y	?	N			
2			Credit 4	Recycled Content	1 to 2
2			Credit 5	Regional Materials	1 to 2
		1	Credit 6	Rapidly Renewable Materials	1
1			Credit 7	Certified Wood	1

10 4 1 Indoor Environmental Quality Possible Points: 15

Y	?	N			
Y			Prereq 1	Minimum Indoor Air Quality Performance	
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	
		1	Credit 1	Outdoor Air Delivery Monitoring	1
1			Credit 2	Increased Ventilation	1
1			Credit 3.1	Construction IAQ Management Plan—During Construction	1
1			Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
1			Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1
1			Credit 4.2	Low-Emitting Materials—Paints and Coatings	1
1			Credit 4.3	Low-Emitting Materials—Flooring Systems	1
1			Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1
	1		Credit 5	Indoor Chemical and Pollutant Source Control	1
1			Credit 6.1	Controllability of Systems—Lighting	1
		1	Credit 6.2	Controllability of Systems—Thermal Comfort	1
1			Credit 7.1	Thermal Comfort—Design	1
1			Credit 7.2	Thermal Comfort—Verification	1
	1		Credit 8.1	Daylight and Views—Daylight	1
	1		Credit 8.2	Daylight and Views—Views	1

6 Innovation and Design Process Possible Points: 6

Y	?	N			
1			Credit 1.1	Innovation in Design: Green Education, Active Occupants	1
1			Credit 1.2	Innovation in Design: Green Cleaning Policy and IPM Plan	1
1			Credit 1.3	Innovation in Design: EP Green Power	1
1			Credit 1.4	Innovation in Design: EP	1
1			Credit 1.5	Innovation in Design: EP	1
1			Credit 2	LEED Accredited Professional	1

1 2 1 Regional Priority Credits Possible Points: 4

Y	?	N			
1			Credit 1.1	Regional Priority: SSC6.1 Stormwater - quantity control	1
		1	Credit 1.2	Regional Priority: EAc2 On-Site Renewable Energy	1
		1	Credit 1.3	Regional Priority: WEc2 Innovative Wastewater Technology	1
		1	Credit 1.4	Regional Priority: EAc1 Optimize Energy Performance 40%	1

60 31 19 Total Possible Points: 110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

GREEN ROOF & PV PANELS

- GREEN ROOF
- PV PANELS



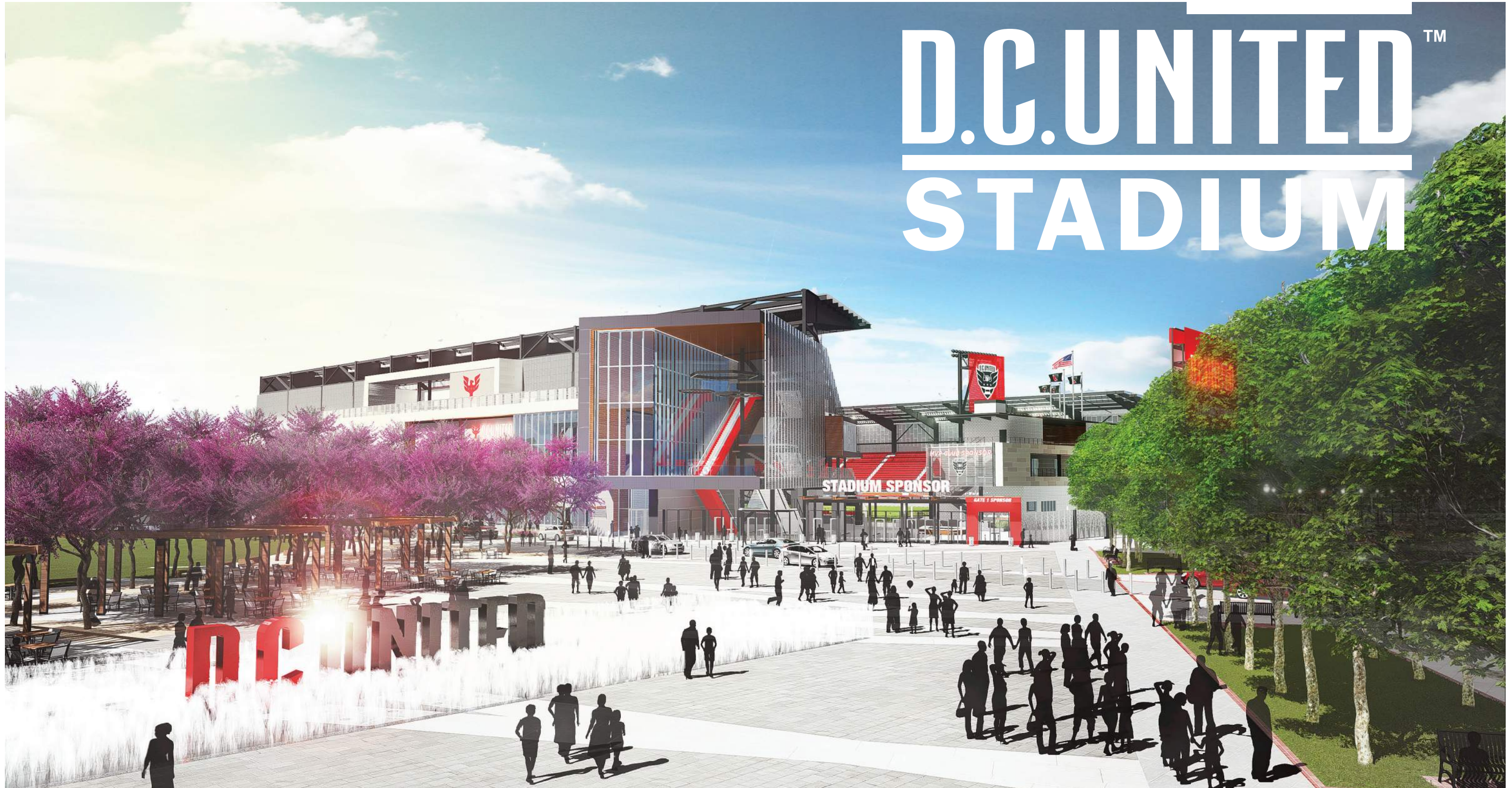
SUSTAINABLE MATERIALS



TAKTL CONCRETE PANEL

PRODEMA

D.C. UNITED™ STADIUM



SECTION

10

APPENDIX:
STADIUM SEATING
COMPARISONS

STADIUM PRECEDENT
IMAGES

STADIUM MULTI USE
CONFIGURATIONS

- 10.01 MLS STADIUM SEAT COMPARISON
- 10.02 MLS STADIUM SEATING BOWL EXAMPLES

- 10.03 URBAN STADIUM PRECEDENT IMAGES
- 10.04 URBAN STADIUM PRECEDENT IMAGES

- 10.05 STADIUM MULTI USE CONFIGURATIONS
- 10.06 STADIUM MULTI USE CONFIGURATIONS
- 10.07 STADIUM MULTI USE CONFIGURATIONS
- 10.08 STADIUM MULTI USE CONFIGURATIONS

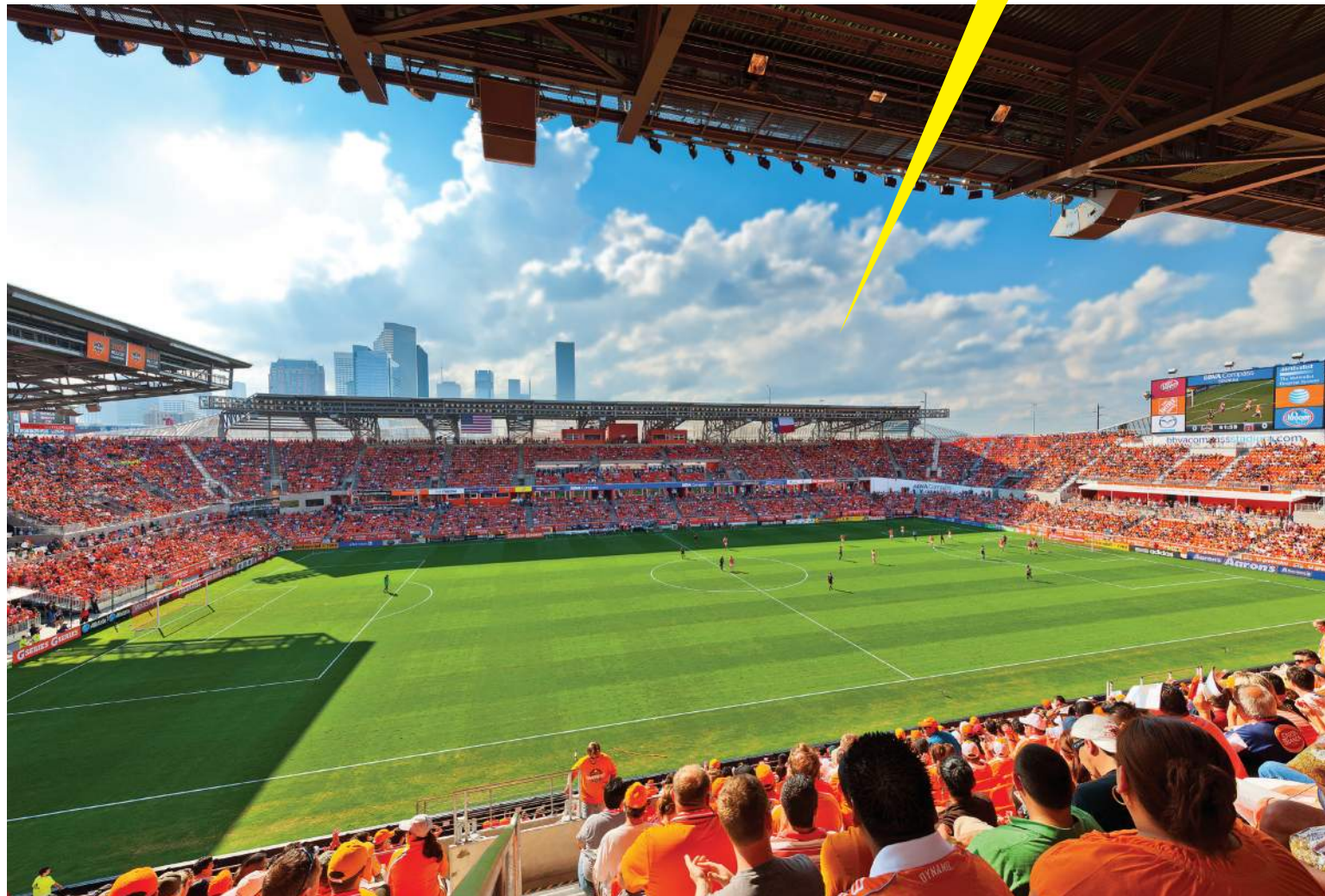
D.C. UNITED STADIUM

MLS STADIUM SEAT COMPARISON - OPENED IN THE LAST 10 YEARS

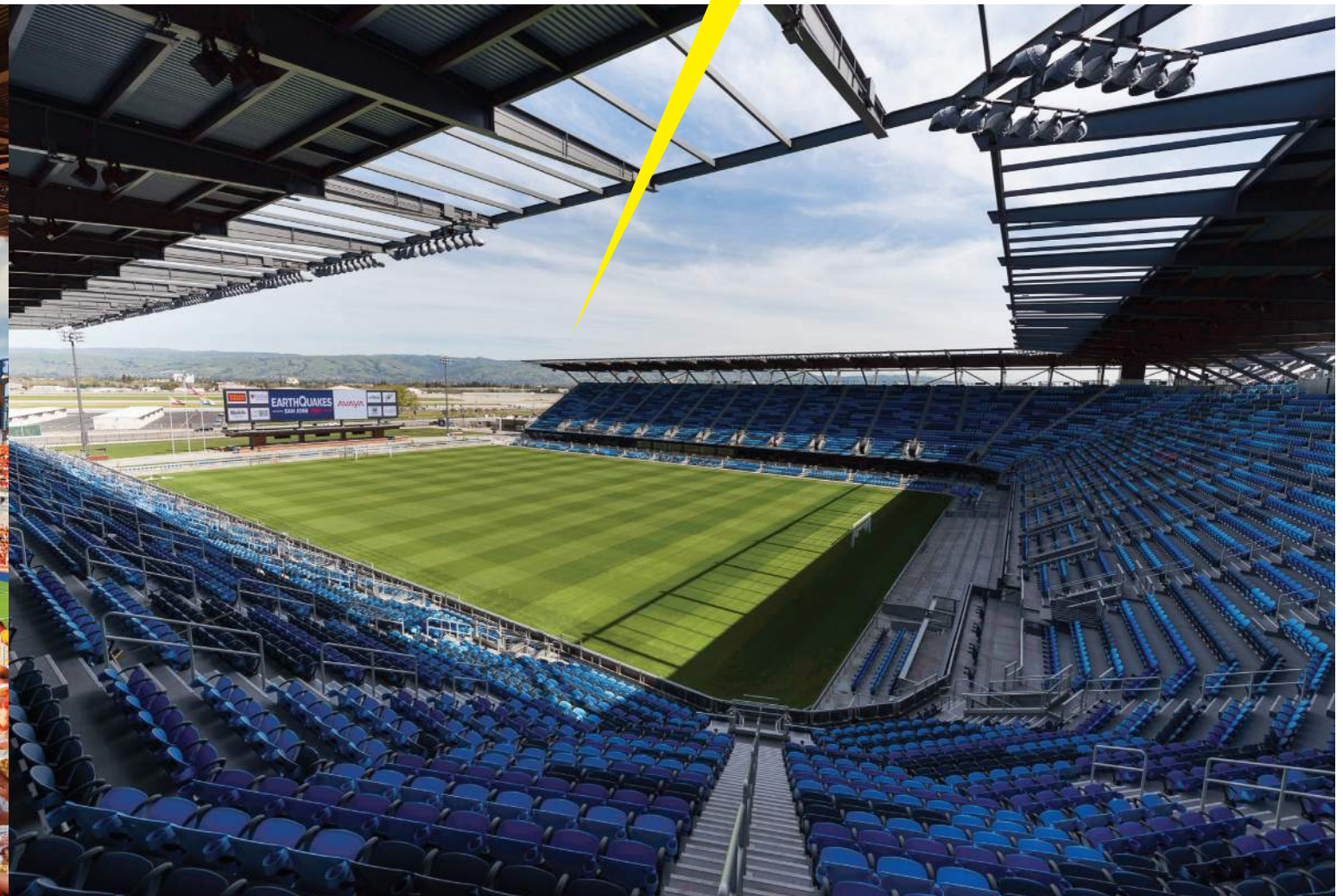
MLS STADIUM	LOCATION	YEAR OPENED	CAPACITY
Avaya Stadium	San Jose, CA	2015	18,000
BBVA Compass Stadium	Houston, TX	2012	22,039
Children's Mercy Park	Kansas City, MO	2011	18,467
Providence Park	Portland, OR	2011	21,144
Sauto Stadium	Montreal, Quebec	2012	20,801
Talen Energy Stadium	Chester, PA	2010	18,500
Red Bull Arena	Harrison, NJ	2010	25,000
Rio Tinto Stadium	Sandy, UT	2008	20,213
Dick's Sporting Good	Commerce City, CO	2007	18,086
Toyota Park	Bridgeview, IL	2006	20,000
AVERAGE			20,225
D.C. United Stadium	Washington D.C.	2018	19,100



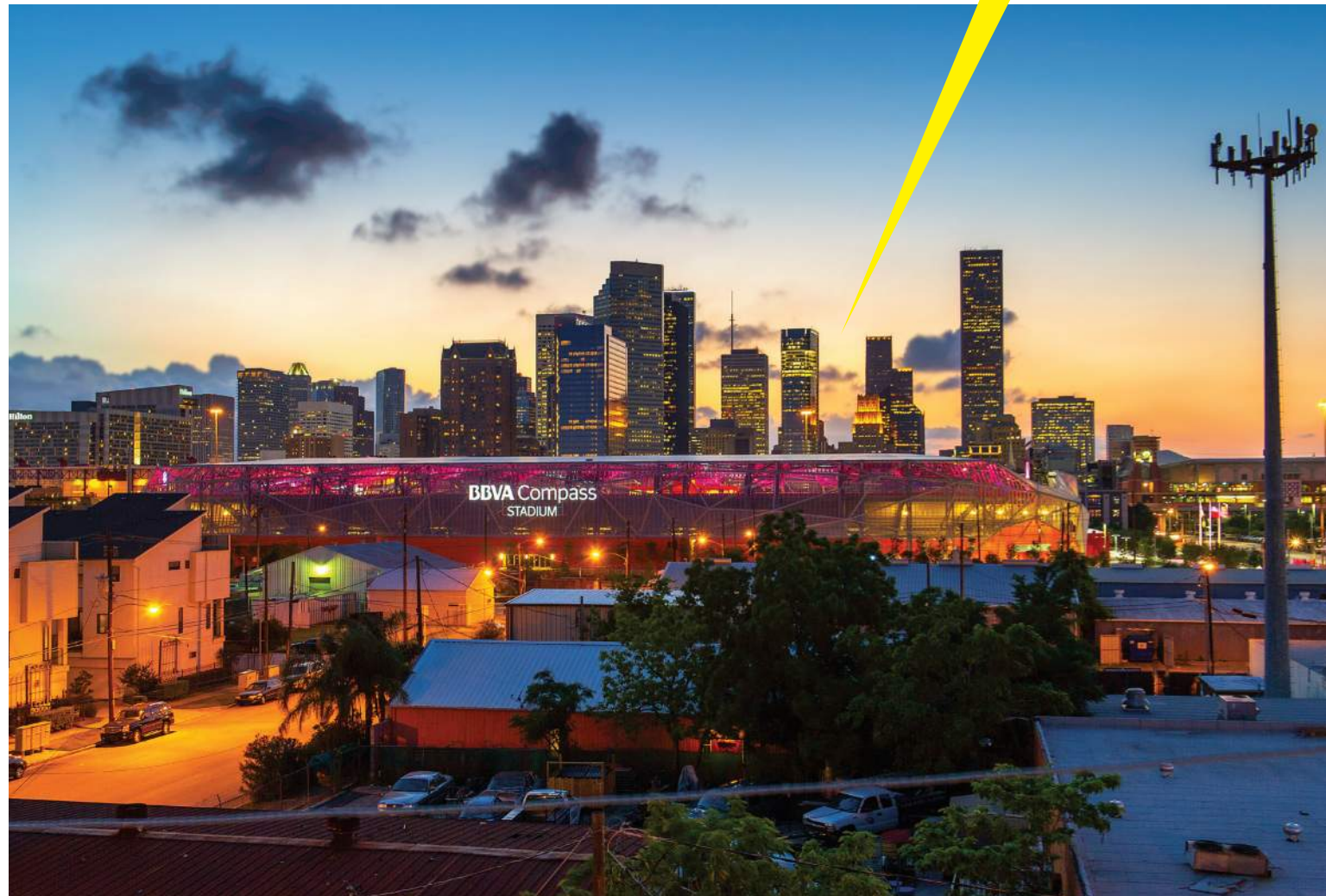
BBVA COMPASS STADIUM - HOUSTON



AVAYA STADIUM - SAN JOSE



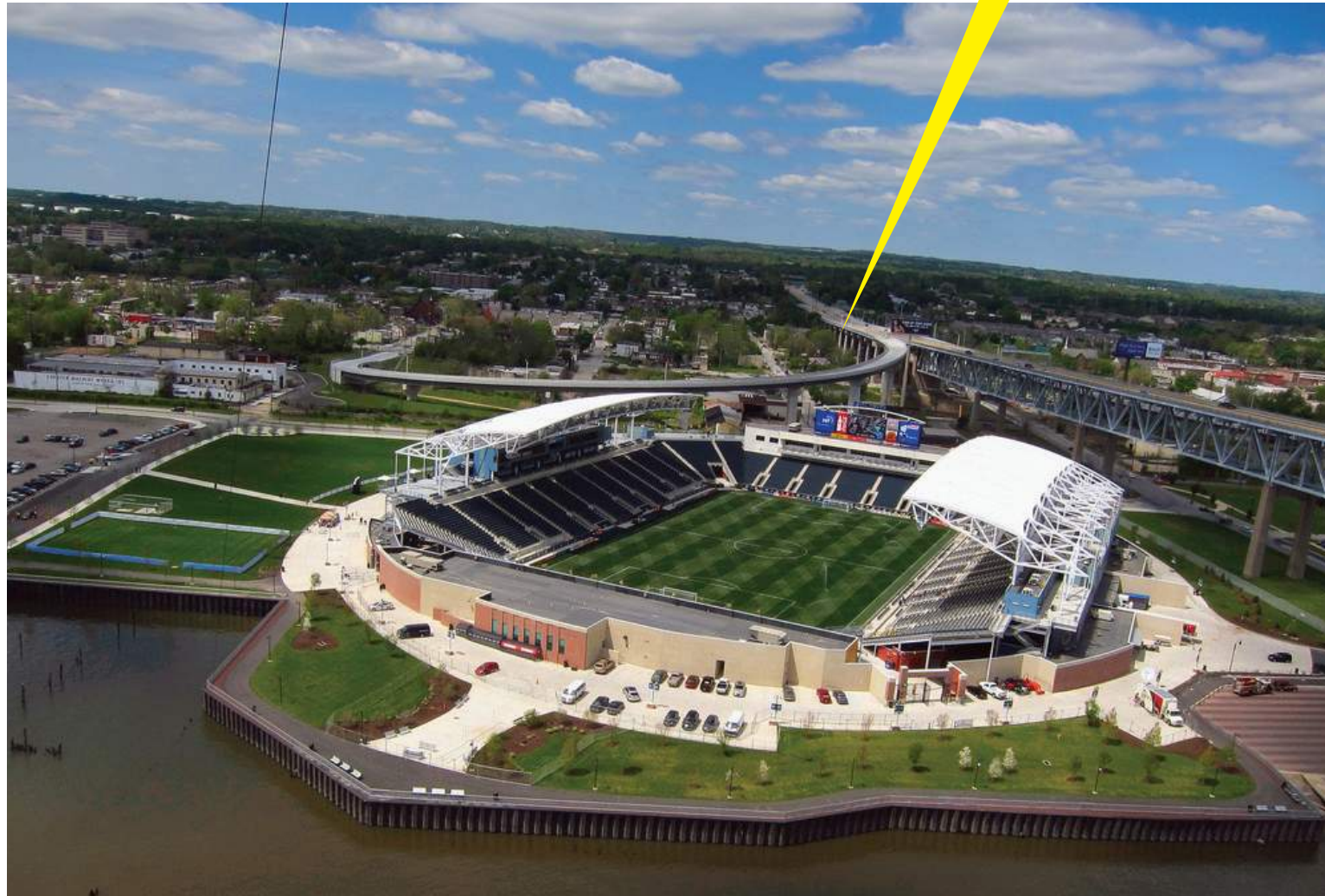
BBVA COMPASS
STADIUM- HOUSTON



AVIVA STADIUM - DUBLIN



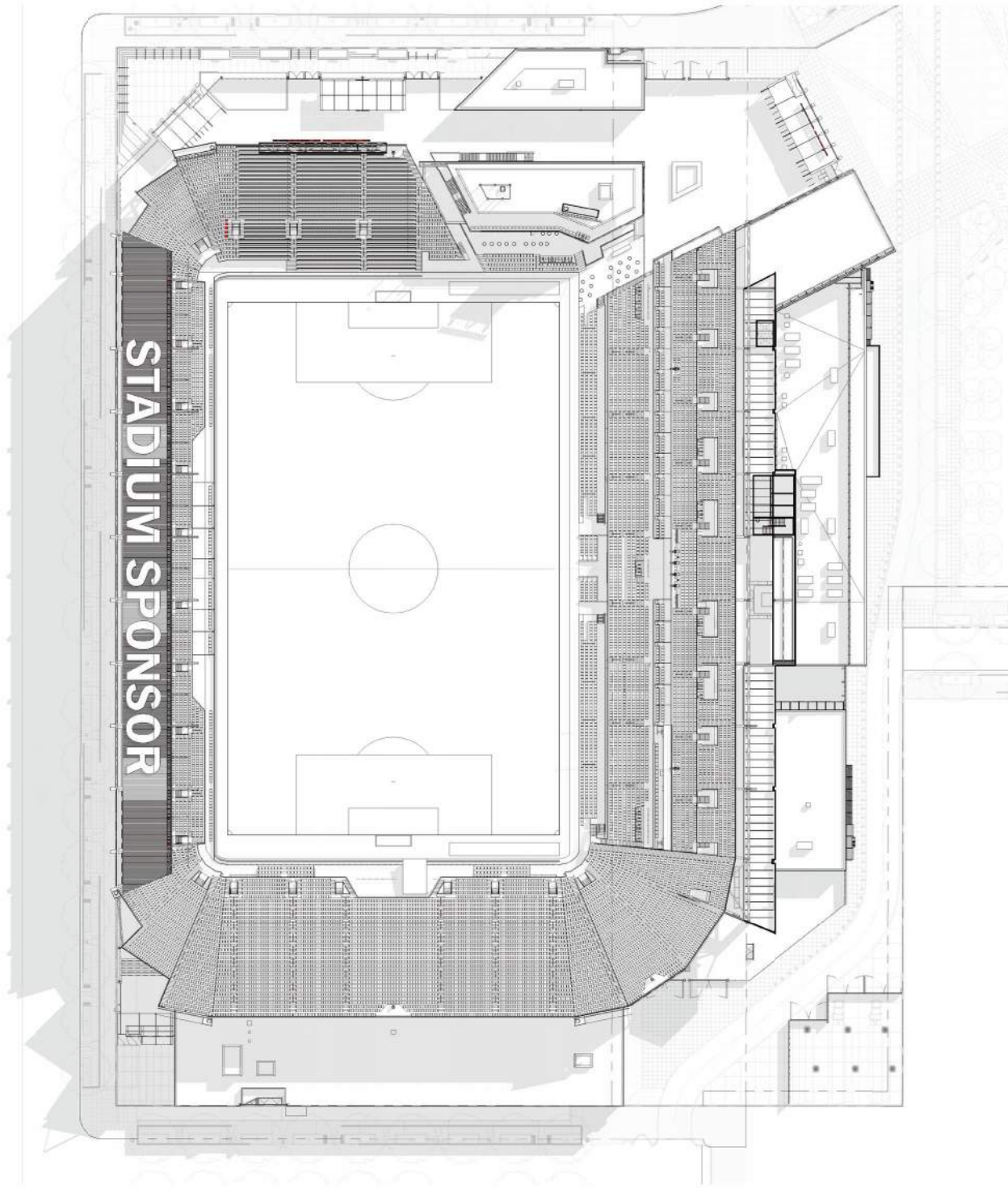
TALEN ENERGY
STADIUM- PHILADELPHIA



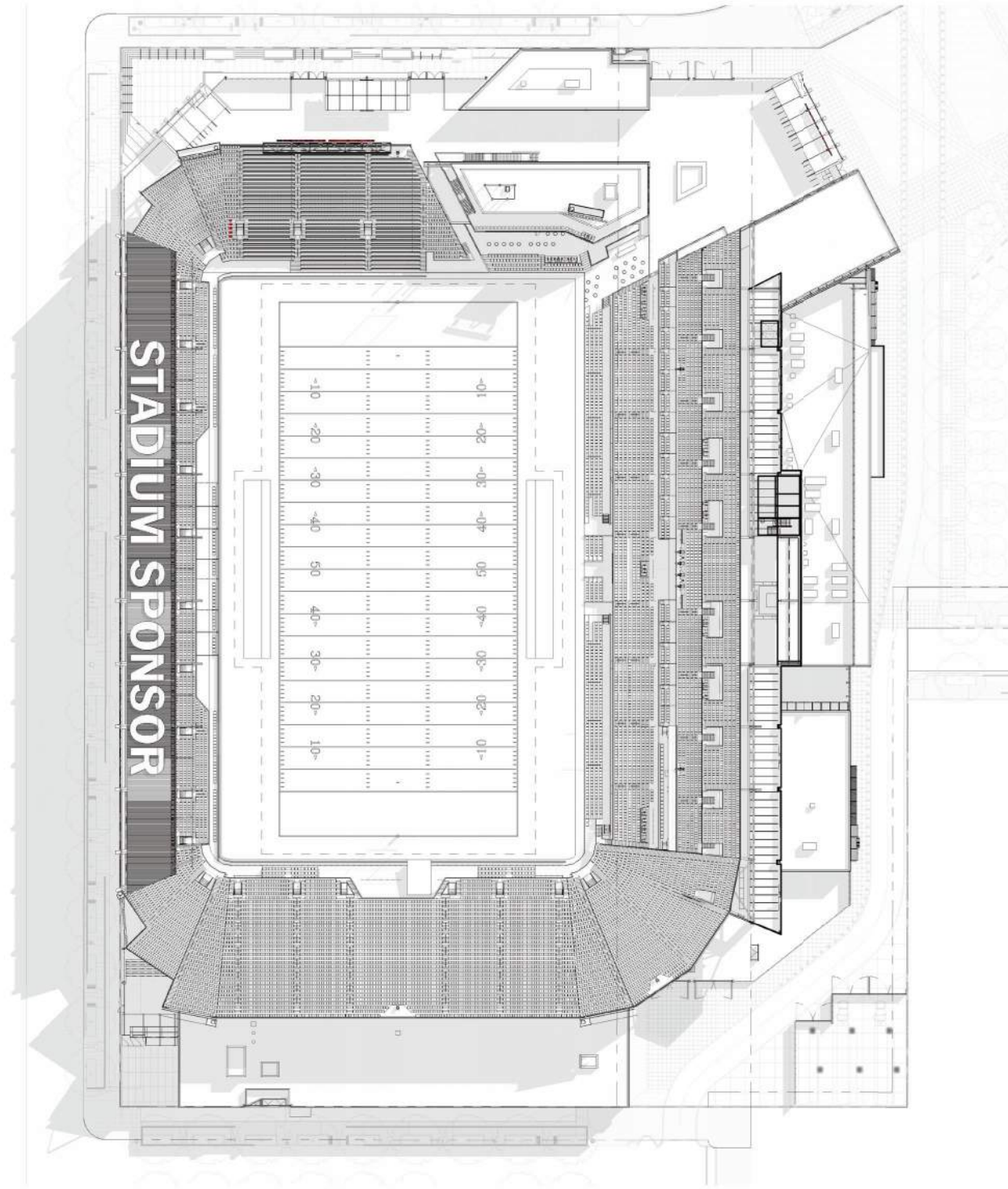
SPRINT CENTER -
KANSAS CITY



STADIUM MULTI USE CONFIGURATIONS



2 SOCCER FIELD LAYOUT
1" = 50'-0"



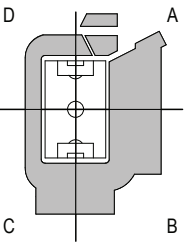
1 FOOTBALL FIELD LAYOUT
1" = 50'-0"

POPULOUS
Marshall | Moya Design

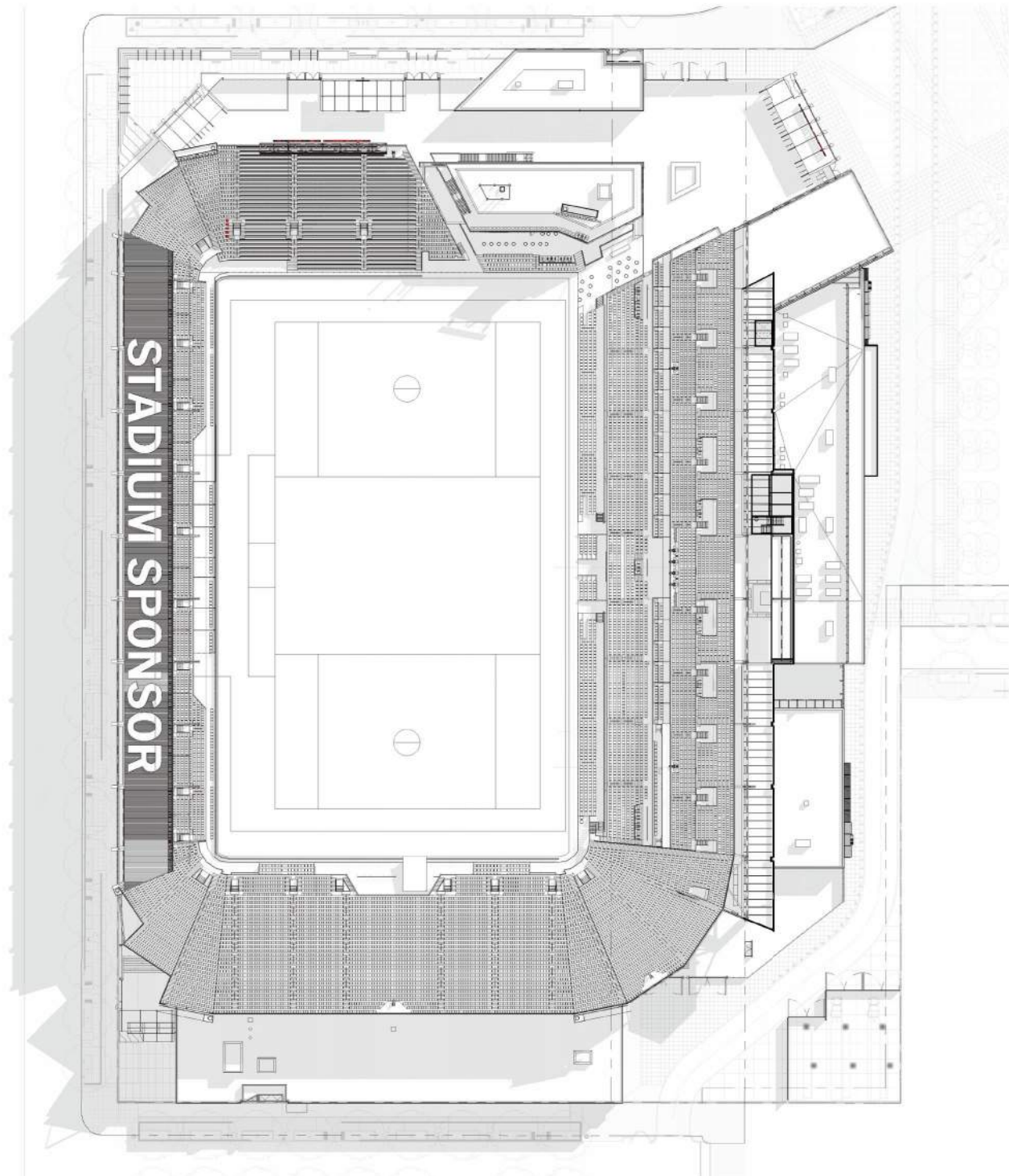


DC UNITED SOCCER STADIUM
100 Potomac Avenue, SW
Washington, DC 20024

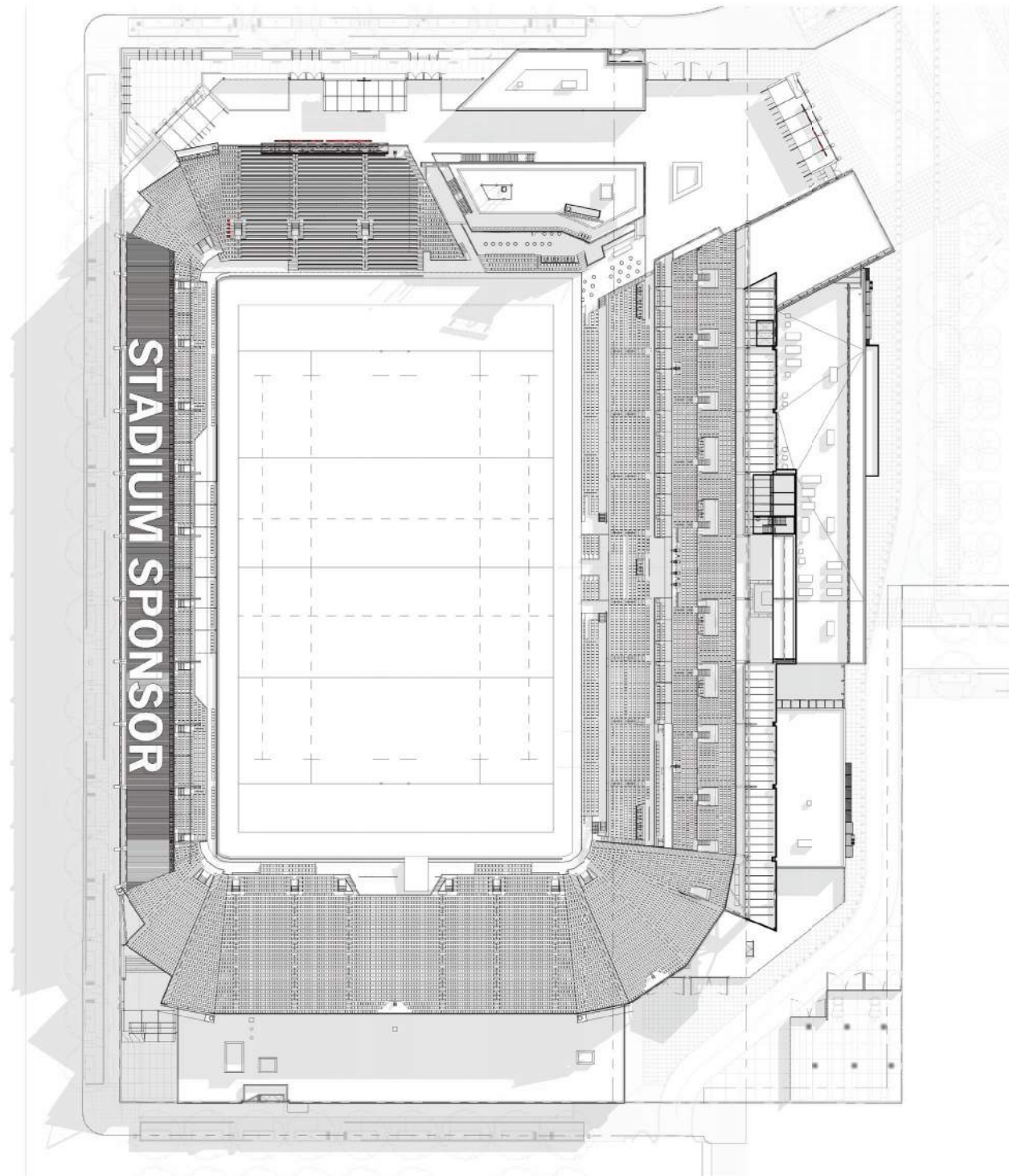
PUD #2 SUBMISSION



PROJECT NORTH
STADIUM MULTI USE CONFIGURATIONS



② LACROSSE FIELD LAYOUT
1" = 50'-0"



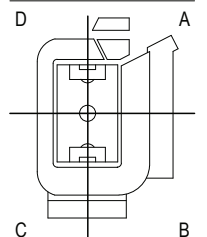
① RUGBY FIELD LAYOUT
1" = 50'-0"

POPULOUS
Marshall Moya Design



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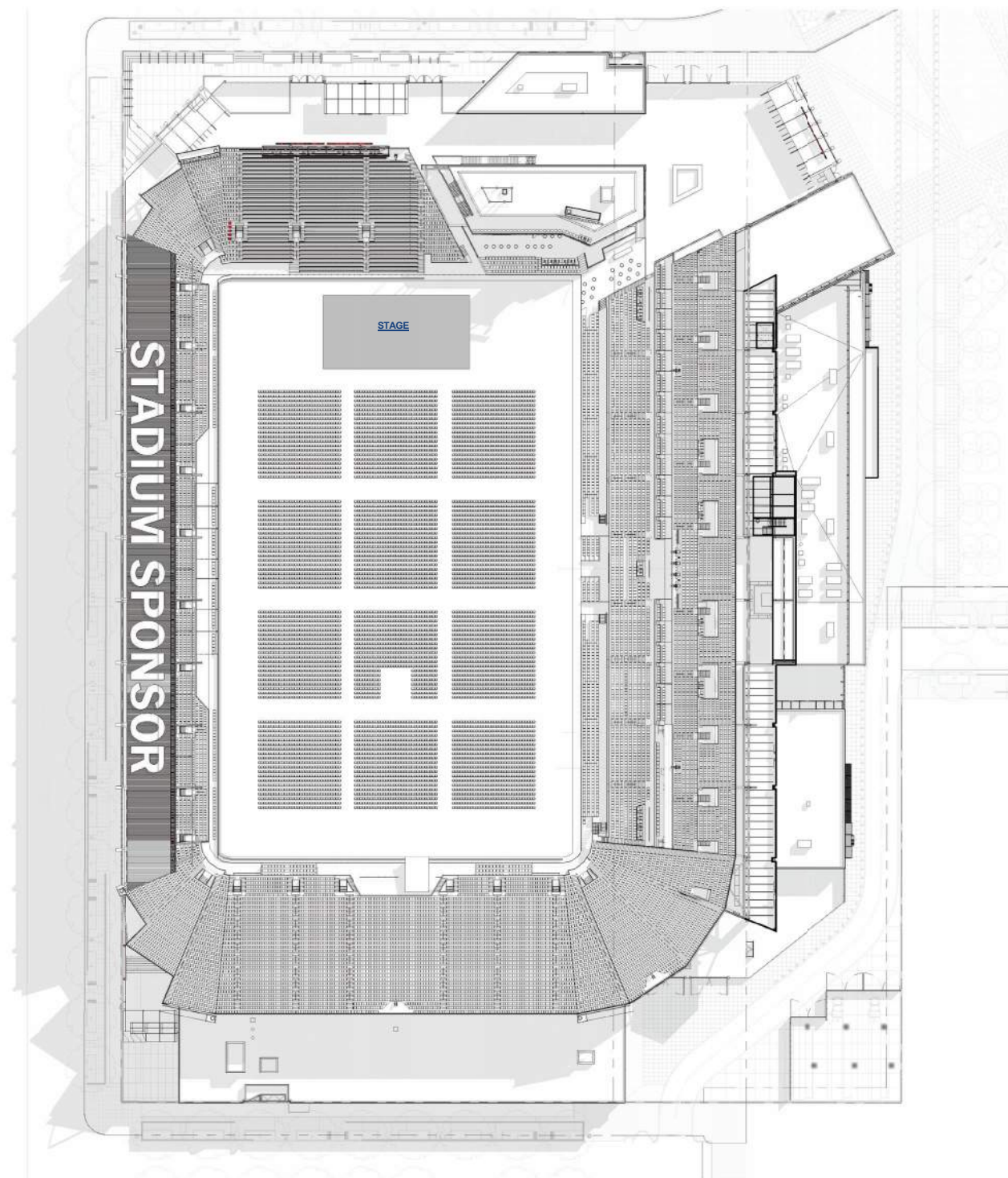
PUD #2 SUBMISSION



POPULOUS



STADIUM MULTI USE
CONFIGURATIONS



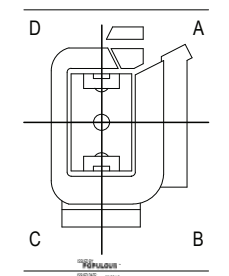
1 CONCERT FIELD LAYOUT
1" = 50'-0"

POPULOUS
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100 Potomac Avenue, SW
Washington, DC 20024

PUD #2 SUBMISSION



STADIUM MULTI USE CONFIGURATIONS

DC UNITED STADIUM

ANACOSTIA WATERFRONT
100 POTOMAC AVENUE, SW
WASHINGTON, DC 20024
SECOND-STAGE PUD
AUGUST 19, 2016



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Turner

Marshall | Moya Design
 LEGENDS®
PROJECT DEVELOPMENT