

Architects' Thoughts on Local Identity in Design Descriptions of Stadiums

スタジアムの設計記述に見る地域アイデンティティに対する建築家の意識

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1.1 Introduction

In sports culture, professional teams, supported by local residents or enterprises, often represent their local communities. As symbolic manifestations, stadiums play a crucial role in fostering community engagement. While designing these stadiums, many architects attempt to express the identity of local communities and create new urban symbols that serve as catalysts for a sense of belonging among visitors.

Since 1990, many stadiums have been built or renovated, due to safety regulations following the fatal incident at Hillsborough Stadium in England. This research aims to clarify how architects express local identity in stadium design through analysing their design descriptions of 76 major home stadiums on architect's websites, architectural magazines and news media.

1.2 Methodology

The research object is defined as "a home stadium, built or renovated after 1990¹⁾, from 11 top-tier baseball and football leagues worldwide with a capacity of over 15,000". A total of 339 design strategies²⁾ from 113 texts covering 76 projects are identified.

In this research, architects' thoughts on local identity refer to design strategies that enable visitors to recognise the stadium's local context and engage in community activities on and around the stadium site.

As shown in Fig. 1, each case is analysed based on architects' texts from four perspectives. Firstly, in Chapter 2, architects' recognition of the local context is analysed. In Chapter 3, the design approaches of architects in expressing local identity are discussed, analysing where these design operations are applied, specifically to representation parts, and how each design strategy exerts impact across the three scales: urban, building, and human.

2 Architects' Recognition of the Local Context

In this research, local context refers to the stadium's place-based characteristics, such as the regional environment of the stadium. Architects' recognition of the local context is divided into two categories, the Physical and the Cultural part (Fig.2). The Physical part refers to substantial local environmental elements, divided into 3 groups: Building ({pB}), Landscape ({pL}), Infrastructure ({pN}). The Cultural part refers to local cultural elements and is divided into 3 groups: Brand ({cB}), History ({cH}), Event ({cE}).

Both the Physical and Cultural parts share a fairly similar portion, while the most frequent way to recognise local context is through {pB}. It suggests that architects often draw on buildings commonplace in the local region, or carry over the visual identity of former stadiums, now iconic landmarks rooted in communities, into the design of new venues. Additionally, although Shelter in {pN-} is the least recognised overall, all cases are found in Japan, where stadiums serve as protection against natural disasters, reflecting a local identity shaped by disaster prevention.

3.1 Design Approach

Design Approach refers to the specific method adopted by architects to develop a design to express local identity. Based on the nature of the design approaches, extracted from architects' texts, they are classified into 7 types and 2 groups: Tangible: <Form>, <Space>, <Structure>, and <Material>; Intangible: <Function> and <Circulation>; and dual-aspect <Finishing & Lighting> (Fig. 3).

The Design approaches in the group of Tangible dominate overall, suggesting that architects express local

Name	Source	Architects	Location	Open Year
No.30 Allianz Arena	Architect's Websites	Herzog & de Meuron	Munich, Germany	2005
The Stadium as an Illuminated Body				
As a huge luminous body, the stadium marks a new location in the open landscape to the north between the airport and downtown Munich. The skin of the luminous body consists of large, shimmering white, diamond-shaped ETFE cushions, each of which can be illuminated separately in white, red or light blue. The football stadium will be the home of two local football clubs, FC Bayern Munich (club colours: red, white) and TSV 1860 (club colours: blue, white). The color of the cushions can be controlled digitally so that the home team playing in the stadium can be identified from the outside: Red for FC Bayern Munich, blue for TSV 1860. The changing appearance of the stadium will enhance its attraction as an urban monument even for people who are not interested in football.				
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>2. Local Context {cB}</p> <p>3.1 Design Approach <Material> <Finishing & Lighting></p> <p>3.2 Representation Part [Façade]</p> <p>3.3 Impact of Scale [URB]</p> </div> <div style="width: 45%; border: 1px solid black; padding: 5px;"> <p>2. Local Context {cB}</p> <p>3.1 Design Approach <Material> <Finishing & Lighting></p> <p>3.2 Representation Part [Façade]</p> <p>3.3 Impact of Scale [URB]</p> </div> </div>				

Fig.1 Analysis Example

Physical	Building {pB-}				Landscape {pL-}				Infrastructure {pN-}							
	Former Stadium		Local Building/Style		Landform		Vegetation		Water Body		Natural Phenomeno		Transport		Shelter	
67	29		31		7		12		16		8		10		3	
Cultural	Brand {cB}				History {cH-}				Event {cE-}							
	Team Image		Tottenham Hotspur Stadium		Industrial		Maritime		Political		Philosophy/art		Festival Event		Daily Event	
55	33		33		5		4		7		12		8		5	

Fig.2 Local Context

Note: Numbers in this figure represent case numbers

identity through visible and measurable interventions more. On the other hand, due to the high reliance on human engagement of the design approaches such as <Finishing & Lighting>, <Function> and <Circulation>, fewer cases are related to Intangible.

The most prominent tendency lies in the <Function> part, where 22.1% (75/339) are transforming into multi-use places, 365-day civic hubs for urban or community activities. They can host concerts, or serve as community libraries, and entertainment complexes, instead of being grounds for teams exclusively. This indicates the tendency of the utilisation of stadiums besides sports activities. The second strongest tendency is from <Material> (18.9%, 64/339). Architects often adopt materials from local commonplace buildings or those representing regional historical culture. New materials, like membranes or metal bars, can also be utilised to introduce a special appearance as the new iconic landmark for the urban environment. However, <Structure>, which is a very important perspective during the design of large span architecture, is somehow the least adopted approach. It shows that it is difficult to use the design approach of <Structure> to express the local identity.

3.2 Representation Part

The representation part refers to the area of the stadium where a design approach is applied to express local identity. Based on architects' texts, they are grouped into 7 categories: [Gathering Space], [Façade], [Roof]³, [Pathway], [Stand], [Others]⁴ and [Landscape Design]. Twelve typical combinations⁵ of representation part and design approach, each appearing over 10 times, are identified: [Façade] × <Finishing & Lighting>, [Others] × <Finishing & Lighting>, [Façade] × <Material>, [Roof] × <Material>, [Others] × <Material>, [Façade] × <Form>, [Roof] × <Form>, [Roof] × <Structure>, [Pathway] × <Circulation>, [Gathering Space] × <Function>, [Gathering Space] × <Space>, [Stand] × <Space> (Fig. 4).

Among the 12 combinations, [Façade] and [Roof] each adopt 3 design approaches, reflecting their high operability as the most visually defining parts of a stadium. Similarly, <Material> appears across 3 rep-

resentation parts, indicating its broad adaptability. Inside <Material>, all cases are mainly derived from the local Physical context, showing that a stadium can maintain its unique local characteristics by utilising materials. Except for 3 types in <Material>, [Stand] × <Space> and [Pathway] × <Circulation>, the remaining 7 types exhibit a similar portion when derived from the local Physical and Cultural contexts. This suggests that, in most cases, both the physical and the cultural mediums serve as components of stadium design. [Gathering Space] × <Function>, as the most frequent combination, shows that architects often consider the functional positioning of a stadium when it serves as or is being set up as a gathering space. [Others] × <Finishing & Lighting> is the least frequent combination, while it is not among the most common strategies, it remains an effective and meaningful one. It still shows a valid design approach, for instance, using iconographic imagery on walls.

3.3 Impact of Scale

The impact of scale refers to the scale, at which architects' interventions expressing local identity exert influence. Based on architects' texts, architects create impacts across three domains: «Urban», «Building», and «Human» (Fig. 5). The impact of the 12 typical combinations extracted from 3.2 is shown in Figure. 6.

In the «Urban» scale, architects respond to the demands of urban domains, merging visually or functionally into the city and giving impact to its fabric and function. Even though only 4/12 typical combinations ([Gathering Space] × <Function>, [Gathering Space] × <Space>, [Pathway] × <Circulation>, [Roof] × <Form>) are dominated by it, «Urban» scale impact appears the most. Combinations involving [Gathering Space] most fall in «Urban», suggesting that stadium impacts the life of the city in general as an everyday social space for residents. In the «Building» scale, architects respond to the demands of events by focusing on elements within the site, giving impact to the building itself. Five typical combinations ([Roof] × <Structure>, [Façade] × <Material>, [Façade] × <Form>, [Façade] × <Finishing & Lighting>, [Roof] × <Material>) are dominated by it. The high fre-

■ Tangible 227				■ Both 47		□ Intangible 159	
Form 40	Space 51	Structure 25	Material 64	Finishing & Lighting 47	Function 75	Circulation 37	
[...] lies next to an Area of Outstanding Natural Beauty in the South Downs, and this in turn inspired the sweeping architectural form of the stadium. [...] roof structure and cladding evoke the forms of the rolling hill backdrop.	To express the city's traits of canyons, [...] [we] open up the space between the bowl's steel structure [...] this space connects the seating bowl to the "garden" buildings. [...] designing open air spaces that allow the sunlight [...]	The roof is supported structurally by a 133-metre-high arch that soars above the stadium. An iconic replacement for the old building's twin towers, [...] an instantly recognisable London landmark.	[...] large, shimmering white, diamond-shaped ETFE cushions, each of which can be illuminated separately in white, red or light blue. [...] attraction as an urban monument even for people who are not interested in football.	[...] by incorporating key elements of the look and feel of the club's old Highbury Stadium. This includes a recreation of the Highbury Ground entrance sign at the club's new home using the same distinctive Gothic Bank typeface.	The Design Impact: [...] But the first public events there showed the venue's intended versatility, when [...] hosted graduation ceremonies for several North Texas high schools [...]	The landscape was designed to express the joy of movement, focus, and circulation—these qualities are sculpted into the white roof known as the "Peace Wing."	

Fig.3 Design Approach

Tangible ■ Both ■ Intangible □

Local Context: Physical ● Cultural △	Representation Part 339							
	G Gathering Space 75	F Façade 73	R Roof 53	P Pathway 46	S Stand 41	O Others 37	L Landscape Design 19	
Function (75)	G-Fu 48 ● 24 △ 24	-	4	6	4	5	7	
Material (64)	1	F-Ma 27 ● 19 △ 8	R-Ma 12 ● 11 △ 1	3	3	O-Ma 15 ● 13 △ 2	3	
Space (51)	G-Sp 15 ● 8 △ 7	8	-	1	S-Sp 24 ● 18 △ 6	-	3	
Finishing & Lighting (47)	3	F-FL 19 ● 9 △ 10	3	5	6	O-FL 10 ● 6 △ 4	1	
Form (40)	4	F-Fo 13 ● 8 △ 5	R-Fo 16 ● 9 △ 7	2	4	-	1	
Circulation (37)	4	-	-	P-Ci 29 ● 23 △ 6	-	-	4	
Structure (25)	-	6	R-St 17 ● 10 △ 7	-	-	2	-	

Fig.4 Combination of Design Approach and Representation Part

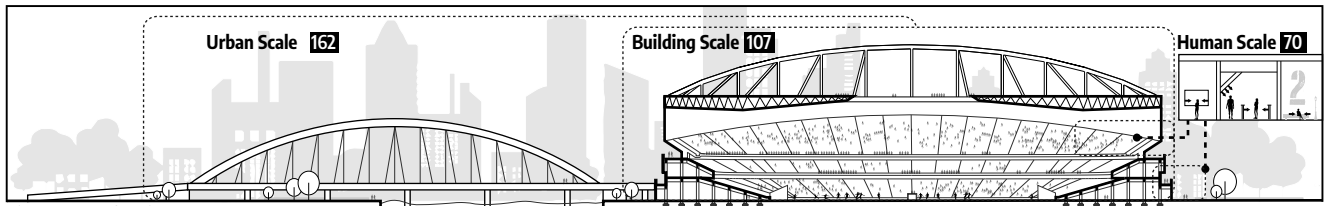


Fig. 5 Impact of Scale

245	Example	G-Fu 48	G-Sp 15	P-Ci 29	R-Fo 16	R-St 17	F-Ma 27	F-Fo 13	F-FL 19	R-Ma 12	S-Sp 24	O-Ma 15	O-FL 10
Urban Scale 117	no.13 Villa Park [...] its roof form is carefully shaped to respond to the surrounding context of the site . Articulated brickwork and metal cladding respond to the rich industrial heritage of Aston. [...]	38	11	18	9	7	11	4	5	3	6	4	1
Building Scale 82	no.5 London Stadium In order to preserve some of the Olympic Stadium's unique identity , the iconic triangular lighting tower design that used to stand over the old roof has been inverted and they now hang underneath the new, larger roof.	7	1	1	6	10	16	9	11	8	6	4	3
Human Scale 46	no.49 Japan National Stadium We paid close attention to how the eaves could adapt to [...], adjusting their projection and angle to create a human scale . The 105mm wood slat spacing was subtly modified [...]	3	3	10	1	1	1	3	3	1	12	7	6

Fig. 6 Scale and Typical Combination

quency of [Façade], [Roof] and [Material] shows their impact is mainly inward. This is likely because architects tend to define the appearance of the stadium itself, rather than altering its relationship with the urban environment. In the «Human» scale, architects respond to the demands of individual experience, and give impact to the user by focusing on how people use the space or element, such as viewing or positioning their bodies. Three typical combinations ([Stand] × <Space>, [Others] × <Material>, [Others] × <Finishing & Lighting>) are dominated by it. In [Stand] × <Space>, the closer the distance between individuals and the pitch is, the more immersive the experience of individuals can be. It often results in each [Stand] being steeper and designed without running tracks. The high frequency of [Others] shows how approachable elements like furniture and decoration can influence how individuals use the stadium.

4. Comprehensive Investigation

Based on the previous two chapters, a comprehensive investigation explores the relationship between local context, design approach, and impact of scale (Fig. 7).

In most cases, the local context of Physical dominates. However, in the case of <Finishing & Lighting>, more cases of Cultural are found, with the strongest tendency in {Cultural-Brand-Team Image}. It shows that local identity can be expressed by using team heraldry, physiognomy, and surface-level iconography such as team emblems and mosaics.

Inside <Function>, each part is evenly distributed, reflecting the proportions of the overall local context.

Inside <Form>, {Physical-Building} dominates, reflecting the importance of both continuing the form of former stadiums and integrating or imitating local buildings. While in this category, they involve only geometric forms, without any symbolic meaning. However, in {Cultural-History-Philosophy/art}, 75% (6 out of 8) have their entire <Form> submerged by an overall symbolic form rather than geometric imitation. This suggests that cultural identities rooted in {Cultural-History-Philosophy/art} often inspire architects to adopt symbolic

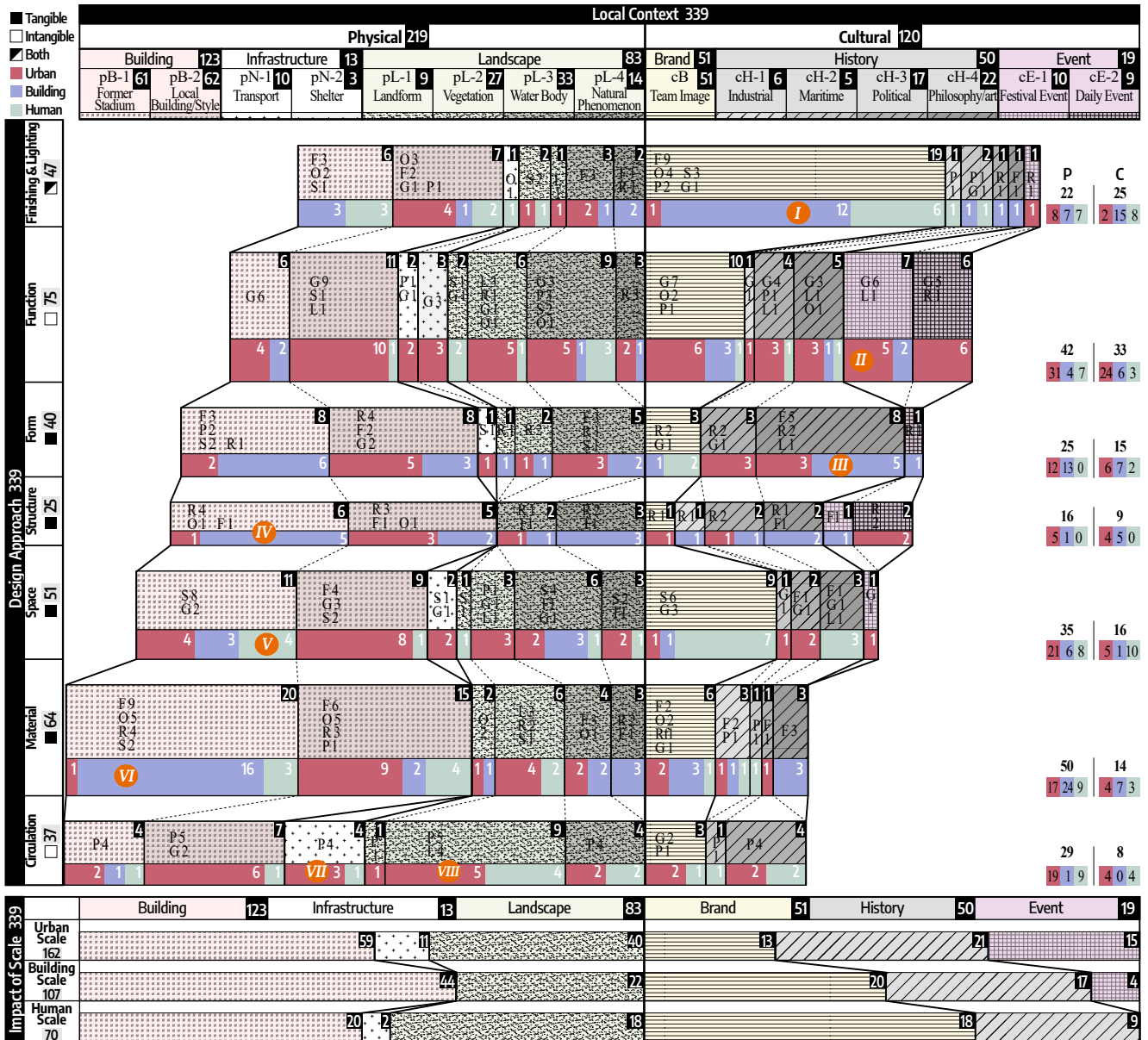
approaches to shape form.

Inside <Circulation>, {Physical-Landscape-Water Body} dominates, suggesting that local identity is often conveyed through visitors' movement and sequential spatial experiences as they engage with surrounding landscapes, especially parks and greenery. Additionally, {Physical-Infrastructure}, which appears less frequently in other design approaches, has a higher proportion here. It shows that local identity can be expressed effectively by connecting and upgrading adjacent transport stations. Additionally, the relationship between local context and the impact of scale is discussed. The impact of the local Cultural context is leaning towards the «Human» scale, indicating that the Cultural context becomes more important when designs are oriented to human experiences.

In the «Urban» scale, {Physical-Building} has the strongest impact, suggesting that by merging with or imitating surrounding buildings, stadiums can reshape the urban grid and functional zoning of the city. In the «Human» scale, {Cultural-Brand-Team Image} has the strongest impact, showing that surface-level iconography can quickly evoke people's emotions, and thus, reinforce local identity among spectators.

5. Conclusion

This research takes the home stadium of a major team as a research object to investigate how architects reflect local identity in stadium design after 1990. Architects first extracted elements from the physical and cultural local context. By utilising specific design approaches, they express the local identity by applying local context to the representation parts. Interventions from architects can exert an impact on different scales, from urban, building, to human scales. To sum up, stadiums are turning into multifunctional venues for civic activities in the «Urban» scale, with a role of being set up as a gathering space for residents. Lastly, local identity can be expressed more through physical local context, as it is easier converted into design. Among them, {Physical-Building} and {Cultural-Brand-Team Image} appear with high frequency when they shape local identity.



<p>I no.2 Brentford Community Stadium AFL Architects {cB} × [P] <Fr & L> × <BLD></p> <p>The concourse lights are able to switch instantly from London Irish green to Brentford FC red. [...] all directly related to the geometric forms in the Bees' branding, the triangular [...]</p>	<p>II no.26 Castelão Arena Vigliecca & Associados {cE-1} × [G] <Function> × <URB></p> <p>The 2014 World Cup, [...] transform the stadium in a multi-function. [...] designed to be "the place for urban events" [...], the parking lots were eliminated, opening up into a great plaza.</p>	<p>III no.40 Chengdu Phoenix Hill Stadium HKS {cH-4} × [F] <Form> × <BLD></p> <p>The dynamic exterior architecture of the connected buildings is inspired by Shu Jin, or Imperial Embroidery, an art form that originated in Chengdu centuries ago.</p>	<p>IV no.5 Etihad Stadium Populous {pB-1} × [R] <Structure> × <BLD></p> <p>[...] respected the identity of the original City of Manchester Stadium, utilising the same masts and tensioned cable net roofstructure that make the building [...]</p>
<p>V no.63 Citi Field Populous {pB-1} × [S] <Space> × <HUM></p> <p>[...] seating brings spectators much closer to the action than they'd ever been at Shea Stadium, with nearly half the seats in the lower concourse, finally giving the Mets and their fans [...]</p>	<p>VI no.12 Tottenham Hotspur Stadium Populous {pB-1} × [O] <Material> × <BLD></p> <p>Inside the stadium, crushed aggregate from the foundations of the old White Hart Lane forms the base for the concrete floors, so a huge part of the club's history will be beneath fans' feet.</p>	<p>VII no.73 Target Field Populous {pN-1} × [P] <Circulation> × <URB></p> <p>Viaducts, a freight train line, commuter rail lines, interstate, [...] Target Field maximizes its setting with pedestrian bridges that connect the ballpark to the city.</p>	<p>VIII no.30 Allianz Arena Herzog & de Meuron {pL-2} × [P] <Circulation> × <URB></p> <p>This landscape contains swathes of green that blend in with the vegetation of the surrounding Fröttmaning Heath. Meandering asphalt paths determine and shape the rhythm and flow of [...]</p>

Fig.7 Local Context and Design Approach Combination

Notes:
 1) For this study, 1990 is adopted as the starting point as it follows the Hillsborough safety reforms. It also precedes the 1992 opening of Camden Yards, which sparked America's revival of ballpark design focused on local character and context.
 2) Each design strategy consists of a design approach, a representation part, and a scale. 113 texts covering 76 projects were selected: 90 from architects' websites, 18 from architectural magazines (e.g., Shinkenchiku, Dezeen), and 5 from news media (e.g., The Stadium Business). They include 40 renovations, 8

redevelopments, 8 reconstructions, and 57 new builds.
 3) Roof refers to the envelope above the stands. Of 76 projects, 68 have open roofs, and 8 are fully enclosable (7 retractable, 1 fixed).
 4) Furniture, column, wall, decoration, and unspecified part are included.
 5) 75 cases are covered in typical combinations.