

Chapter 8

Metrics and Margins: Envisioning Frameworks in Indigenous Architecture in Canada

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Introduction

New Architecture on Indigenous Lands was the first book published on the subject of Indigenous architecture for over two decades. It was the work of two academics seeking to compile an inventory of recent architectural projects on Native American lands. In the publication, the authors made some bold statements. They proclaimed that cultural meaning has largely been lost in Western architecture. They also declared that Indigenous¹ architecture is “more complex, profound and meaningful” than current Western practice (Malnar and Vodvarka 2013: 3).

Around the same time as the book was published, there was a highly publicised debate occurring in North American architectural circles. The argument put forward was that architecture had become increasingly disconnected from the public. The *New York Times* ran an article “How to Rebuild Architecture” (Bingler and Pederson 2014), while *Forbes* ran the follow-up article entitled “Architecture continues to implode: More insiders admit the profession is failing” (Shubow 2015). The authors Bingler and Pederson (2014) argued for an architecture that responds to a larger and more diverse client base. At the same time as the articles were published, the American Institute of Architects launched its first public awareness campaign. The *Look Up* campaign, a three-year initiative commencing in 2015, sought to re-connect the public with architecture and to increase public perception of the value of the profession (The American Institute of Architects 2015).

¹A note on the use of the term ‘Indigenous’ in this chapter. The author uses the term Indigenous to refer to a group of people who “resolve to maintain and reproduce their ancestral environments and systems as distinctive people and communities” (UN Permanent Forum on Indigenous Peoples 2008).

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These discourses and initiatives inspire engagement of previously neglected theses. One area where there has been a paucity of research and discourse is the nexus between Indigenous perspectives and knowledge systems, and architecture. Work in this area is long overdue. Indigenous people offer a unique way of looking at the world, “their particular lens carries with it embedded meanings related to spatial organization, collective coexistence, experiential learning, spiritual values and ideological ethics of stewardship” (Dalla Costa 2016). This chapter seeks to articulate this intersection of Indigenous perspectives and architecture.

This chapter is divided into four sections. The first section, *Indigenous story in architecture*, examines culturally based perspectives, reviewing the work of scholars such as Dr Balkrishna (B.V.) Doshi (India) and Professor Hirini Matunga (Ngāi Tahu, Ngāti Mamoe, Ngāti Porou, Ngāti Kahungunu, Rongowhakaata and Ngāti Paerangi) (Aotearoa New Zealand) to discuss the challenges of crafting a cultural thesis of architecture. In the second section, the role of four influences in Indigenous architecture is discussed, the notions of place, kinship, transformation, and sovereignty, and is examined through the work of authors such as Dr Gregory Cajete (Tewa) (Santa Clara Pueblo, New Mexico), Professor Theodore (Ted) Jojola (Pueblo of Isleta) (Isleta Pueblo, New Mexico) and Professor Graham Smith (Ngāti Porou, Ngāi Tahu, Ngāti Apa and Ngāti Kahungunu) (Aotearoa New Zealand). The third section, *Metrics in Indigenous architecture*, reviews measurement systems for the design of the built environment. Three culturally based systems; Matunga’s *Indigenous Planning as Outcome*, the *Te Aranga Māori Design Principles* and Boussora’s nine-part inventory to regional architecture are then used to provide a starting framework for examination. The final section of this chapter, *Indigenous Projects in Canada*, uses the vocabulary developed from these learnings to discuss three architectural exemplars; The Gathering Circle at Prince Arthur’s Landing, the Gordon Oakes Red Bear Student Centre and the Nk’Mip Desert Cultural Centre.

Indigenous Stories in Architecture

Where does one begin a discussion of crafting an Indigenous story in architecture? In *New Architecture on Indigenous Lands*, Malnar and Vodvarka attempted to define typologies in the field of Indigenous architecture, seeking to establish common denominators to help describe, analyse and interpret an incredibly diverse set of projects. The aim is honourable, but perhaps, premature. Until understandings of culture’s innate catalysts are developed and the nature of how these affect architecture, typological assumptions are superficial.

It is useful to look at the work of internationally renowned architect and educator, Balkrishna (B.V.) Doshi. Similar to the experiences of First Nations, Métis, Inuit, and Native American peoples in North America, the colonial occupation and rapid modernisation of India has meant that Indian traditional principles and cultural influences in the built environment have been largely ignored. Doshi’s writings serve as a place of reflection, highlighting the challenges inherent in

Indigenous architecture: capturing cultural undercurrents, transcribing the potency inherent in traditional built environments and seizing the vital role of process in design. These challenges, viewed in another manner, become an opportunity for identifying areas for innovation.

Doshi argues that Western models of architecture and urban planning are ill-suited to Indian culture as they omit critical functions of the built environment.

Pre-industrial Indian architecture served the physical, symbolic, social and spiritual needs of people: At a physical level, it embodied centuries of learning with regard to orientation, climate, building materials and construction techniques. At a spiritual level, the built-form conveyed total harmony with the life-style in all its daily as well as seasonal rituals, unifying the socio-cultural and religious aspirations of the individuals and the community (Doshi 1985: 112).

Doshi describes the deficiency in terms of tangible and intangible parameters, reminiscent of Louis Khan's measurables and immeasurables. By tangible, Doshi is referring to the traditions and their associated context. By intangible, he is referring to the intrinsic relationships that arise between people and their surroundings. According to Doshi, these "abstract, cultural undercurrents" that transcend visual analysis are critical to architecture. They have a dynamic role, nurturing and complementing the sociocultural institutions, and supporting the structures that culture is built on (Doshi 1985: 111). Doshi uses the term *total environment* to describe culturally and socially inspired spatial arrangements in which buildings, spaces and culture exist in a unified whole (Doshi 1985).

Doshi examines traditionally ordered cities, such as Jaisalmer and old Jaipur, to uncover the essential orders of the built environment. The traditional Indian town plan was compact and activated by walkways, complete with niches for pausing and balconies for observing. According to Doshi, this is a complete divergence from current residential realities which he describes as "impersonal bee-hives of flats, in concrete, in isolated locations, separated by unsuitable public spaces" (Doshi 1985: 112). The incongruity Doshi expresses between traditional and contemporary residential architecture is ubiquitous in Indigenous North America, and well documented in the field of architecture (Pettit et al. 2014: 1–70).

Doshi draws another vital connection between the two architectural traditions that is helpful in examining cultural architecture: the role of process. Doshi uses the example of Mughal architecture, in which everyone, community members included, contributed to the final product. Together, they are shareholders in an enterprise where the outcome represented and was of benefit to all (Doshi 1985: 112). Process is also highlighted by Matunga. He claims that process will reveal all the biological, cultural, social, economic and political factors which have the potential to impact the spatial environment. It will also allow the vital links between ancestral places and the inhabitants, to emerge.

In the light of challenges posed by Doshi, a number of questions arise. How do we access intangible, abstract, cultural undercurrents? Perhaps the larger question becomes, can we access the undercurrents for a culture we are not born into? Moreover, we need to question, whether the typical design process, consisting of a

modest amount of ethnographic research and a few community engagement sessions, enables the architect to grasp the complex relationships of the natural, physical and social realities?

Matunga acknowledges the immense challenge in this field. He uses the term multi-layered materiality and memory, to articulate the complex undercurrents in Indigenous spatial planning (Matunga 2013). By materiality, he is referring to the physical quality, presence and structure; by memory, he is referring to the recall of experience and existence. He asserts that capturing these complex undercurrents in contemporary environments is the biggest challenge for spatial planners today, especially considering many of the physical traces have been erased (Matunga 2013: 8).

Catalysts in Indigenous Architecture

To examine architecture from First Nations, Métis or Inuit perspectives, it is necessary to reveal ways of thinking and knowledge systems that impact the environment and the creation of built form. This section will review four catalysts that speak to the epistemology of Indigenous peoples of North America. The author introduced three of the four catalysts (*place*, *kinship*, and *transformation*) at the 2016 Association of Collegiate Schools of Architecture conference in a paper entitled: *Contextualized metrics & narrating binaries: Defining place and process in Indigenous North America* (Dalla Costa 2016). The fourth catalyst, *sovereignty*, has been added, as it is increasingly being expressed and explored through architecture.

This section should be viewed as living and evolving, affected by the changing realities within individual communities. It should also be recognised that not all projects should engage all catalysts. Any architectural project that explores a single catalyst moves the subject of Indigenous architecture forward.

Catalyst One: Architecture as Place

In discussing Indigenous ecological knowledge systems and traditional management practices (and specifically those of the Karuk Tribe), Hillman and Salter note that “[p]urely rational and technical approaches unaugmented by a sense of the sacred or by the sensibilities specific to place will necessarily become destructive and irrational over time” (1997). The same can be said of Indigenous architecture, a field that relies heavily on place.

An insightful story provided by Steven Semken² conveys the entwined nature of place, Indigenous world views and the complexity of the cultural landscape. While in the field, and following a field lecture on ‘science’, his Navajo students would share their understandings of place. Their understandings would be told through naming, stories and traditional interpretations. According to Semken (2016), place is the basis of cultural identity. Ceremony, songs and lifeways (the way people live) emerge from the physical landscape of place.

Gregory Cajete has also examined place and sees it as inseparable from Indigenous thinking. He uses the term *relational worldview* to describe the human–nature relationship in which humans co-occupy the universe with other living things, both animate and inanimate. Cajete (2000) uses terms such as *biophilia*, *animism*, *totemism* and *perceptual phenomenology* to deal with the concept within a Western framework. The codependent relationship between humans and nature is embedded over time in song, story and place-based learning. The result is that Indigenous people are unable to formulate a detached, objective view of land and place (Cajete 2000: 24). The belief system, the natural world, lifeways and ritual are thus integrated.

Compounding this interrelationship, land is tied to the notion of collective stewardship. Ted Jojola reminds us that traditionally, successive generations of people owned land communally. Together, they worked towards the productivity of the land (Jojola 2008: 40). Property was not viewed as a commodity leading to individual prosperity, but a collective responsibility entrusted to the current generation of caretakers. The integration of place-based interactions, accumulated knowledge systems and collective ownership is confirmed by the United Nations definition of Indigenous knowledge:

...the complex bodies and systems of knowledge, know-how and practices and representations maintained and managed by Indigenous peoples around the world, drawing on a wealth of experiences and interaction with the natural environment and transmitted orally from one generation to the next. It tends to be collectively owned whether taking the form of stories, songs, beliefs, customary laws and artwork or scientific agricultural technical and ecological knowledge and the skills to implement these knowledges (UN Permanent Forum on Indigenous Peoples 2009: 64).

When viewed through the lens of either Cajete’s relational world view or Jojola’s notion of collective stewardship, place is a cultural construct, secured through a cultural understanding. Being inspired by place, a common architectural device, and having a belief system tied into place are two very different notions.

²Professor Steven Semken is an ethnogeologist at Arizona State University who investigates the influences of sense of place, culture and their effect on modes of teaching and learning. Semken spent 15 years teaching at Diné College on the Navajo Nation.

Catalyst Two: Architecture as Kinship

Social cohesion is a vital strategy for survival and continuity in traditionally based societies. Matunga tells us that “commitment to the group, and improving the well-being of the kinship community are paramount” (Matunga 2013: 24). Doshi discusses community as the nucleus or ordering device in the creation of physical environments:

In traditional Indian society, one is not alone, but part of a community. Buildings are not built in isolation, but in groups leading to a total environment, merging buildings, spaces, and culture in a unified whole. The community shares everything. ...Unless this socio-cultural tradition is understood, the organization of buildings, streets, spaces and their forms cannot be the desired fabric wherein the community wants to live. It is, therefore, necessary to talk about physical environment in terms of culture rather than only in terms of buildings, space, technology or economy (Doshi 1985: 114).

Overshadowed by Western spatial priorities, many contemporary First Nations, Métis and Inuit built environments do not prioritise kinship as a central ordering device. Architects and planners should not assume this is the desired outcome, nor should assumptions be made of current lifestyles that do not abide by kinship-driven spatial ordering systems. Structures and systems have been interrupted historically. However, there are examples of kinship-centric ordering techniques emerging. Recently, a project called the Niitsitapi Learning Centre aimed to find ways to re-operationalise *community* and kinship structures. With Elders as guides, traditional ordering devices, such as the Seven Grandfather Teachings³ and the Medicine Wheel,⁴ were deployed. These traditions provide the structural basis of culture and foster cultural continuity. Kinship as ordering device cannot be understated.

Catalyst Three: Architecture as Transformation

According to Graham Smith, a vital requirement of Indigenous theory is its transformative ability “where the research gives back to and benefits the community in some manner” (Kovach 2009: 91). The catalyst of transformation has far-reaching impacts in architecture. Designing buildings or creating communities can provide value in many facets of community development including economics, the environment, culture, social well-being and even political sovereignty.

³The Teachings of the Seven Grandfathers, often known simply as either the Seven Teachings or Seven Grandfathers, is a set of teachings on human conduct towards others (Benton-Banai 1988).

⁴While Medicine Wheels are interpreted uniquely in every culture, they generally represent the alignment and continuous interaction of the physical, emotional, mental and spiritual realities (Graveline 1998).

While some impacts are easier to assess, for instance environmental impact, others need thoughtful examination and input from community members. Architectural-economic strategies could include: designing with local construction expertise in mind, specifying materials that contribute to local businesses, or hiring local personnel. Architectural-political strategies include any means to promote self-determination, such as employing traditional building techniques or creating a local advisory board to guide a project.

Architectural-art strategy is an area that requires future consideration. Architecture has a dual role (Pallasmaa 1988: 132). It is both communal and autonomous. However, with the prioritisation of community within Indigenous theory, the dual role becomes blurred. What is the role of the architect? How does an architect (as artist) effectively produce a collective self-image of another culture? While this subject will not be solved here, it is a core challenge within the practice of Indigenous architecture. The solution lies somewhere between being able to identify community-driven priorities, reformulating values in architectural education and providing professionals with tools that enable broad transformational thinking.

Catalyst Four: Architecture as Sovereignty

While cultural continuity has been interrupted by a number of historical events, namely the reservation system, residential schools and the outlawing of culture traditions, re-operationalising culture and the resurrection, restoration and revitalisation of traditional methodologies is actively underway. Other ways of knowing are beginning to have an impact on many disciplines including natural resource development, health care, education, governance and now planning and development.

Architecture, as a discipline, is proving powerful in its ability to express culture and to contextualise traditional knowledge. Due to its transformational aims in many culturally significant domains such as land, environment, culture, spatial meaning, story and historical precedent, it is a potent vessel of communication. It is a means of storytelling. It is healing. Cultural lessons, previously coveted for fear of misuse, are being articulated as pathways to sovereignty.

Architects, in their role as translators, have played and will continue to play a vital role in re-instituting culture. A visual language *will* emerge and will be complemented by what is held within the pages of this book, which is the development of the complementary spoken language (Dalla Costa 2016: 2). This work and the terminology created within are all expressions of sovereignty.

Metrics in Indigenous Architecture

According to the authors of *Design Thinking for Social Innovation*, any system which does not have a means of assessment is precarious. The authors propose a three-part system to ensure validity in the design process: inspiration, ideation and implementation. According to the authors, we are to envision “inspiration as the problem or opportunity that motivates the search for solutions; ideation as the process of generating, developing, and testing ideas; and implementation as the path that leads from the project stage into people’s lives” (Brown and Wyatt 2010: 33).

Design thinking is a useful method in Indigenous architecture, particularly helpful in readdressing the lack of First Nations, Métis and Inuit authorship and agency in the built environment. The majority of built structures, both on and off reserve, have been *inspired by*, and *implemented by*, non-Indigenous professionals. *Ideation*, or testing ideas, is difficult to achieve, as there is no measurement system from which to examine cultural architecture. Meanwhile, metric systems in the design of built environments are becoming increasingly common. The Living Building Challenge is aimed at achieving net zero buildings. It now includes qualitative indicators such as ‘happiness’, ‘beauty’, ‘spirit’ and ‘inspiration’. Other systems focus on process or engaging participatory design, which is the case in Social Economic Environmental Design (SEED). While still others, such as the Circle of Sustainability, serve to broaden the definition of sustainable urban environments, with culture as one of the main four indicators. As a group of initiatives, they enable the critical feedback loop, of both quantitative and qualitative measurements, within the built environment.

Two culturally based metric systems are included in this discussion to bring cultural priority to the forefront. The first is the *Te Aranga Māori Design Principles*. The principles were developed in conjunction with Māori professionals and the Ministry of Environment, and published as part of the *Auckland Design Manual*. They are application-based principles, designed for enhancing cultural outcomes in design (Ministry of Environment 2005). The second metric was developed by Algerian architect and academic Kenza Boussora. Boussora’s work was a response to contemporary (and often climatically unsuitable) architecture being constructed in Algeria. The result is a nine-part inventory aimed at reinstating architectural values derived from the local culture, spatial norms, climate and economy.

Codes for collective living are well established in traditional North American Indigenous society. The establishment of codes served multiple purposes: to share history, to transfer generational knowledge, to affirm values and to ensure social cohesion (Kovach 2009: 95). The codes were communicated orally, told through story, song and prayer, and enabled visually through symbols, and occasionally built form. An example of codified values in built form is the Cree tipi poles. In the Cree belief system, each tipi pole represents a value, for example, humility, kinship or sharing. The act of erecting a tipi served to embrace these values into everyday life.

Architecture is a means of codifying values and telling a story. Buildings convene multiple disciplines into a single endeavour, creating a mechanism for dialogue. The disciplines impacted include: the environment, economics, natural sciences, geography, history, public engagement, sovereignty and artistic expression. Moreover, architecture fosters a conversation on many levels, including the space between Indigenous and non-Indigenous science and ways of knowing. Through both the process and product of architecture, rich relationships are fused between the storyteller, which in the case of Indigenous architecture is community + architect, and the listener or viewer.

Cultural catalysts in Indigenous architecture remain underutilised. Until these notions are embedded in architectural education and practice, metrics are a useful mechanism to articulate community-driven aims. The topics provided by Matunga's *Indigenous Planning as Outcome* can be viewed as margins for exploration in architecture. The categories provide a structure to the discussion of metrics. As Matunga reminds us, our aim, as spatial planners, is to find adaptive ways of working within these culturally driven outcomes (Matunga 2013: 31).

Assessing architecture as *outcome*, instead of using *process*, as in the SEED tool, is intentional. Outcomes allow the reduction of broad aims in architecture, into achievable categories of giving back. The areas of return include: cultural, environmental, economic, political and social. While it can be recognised that not all projects can engage all catalysts, it can be seen through examining three Canadian projects in this chapter that engaging multiple outcomes in one project is possible.

Contemporary Indigenous architecture is a developing field. While applying prescriptive measures to a creative field is undesirable, the ability to measure success is crucial. By giving language and structure to the catalysts, processes and outcomes in cultural architecture, it is possible to achieve four concurrent goals: to embed catalysts (place, kinship, transformation and sovereignty) as drivers; to initiate the development of architectural terminology to describe cultural undercurrents; to assist professionals by highlighting vital design opportunities that secure local priorities; and finally, to create a user-friendly feedback loop within which the community can participate. The last goal is critical for Indigenous peoples to re-operationalise *their* language in a contemporary context.

Outcome One: Cultural Protection and Enhancement

Culture is a broad concept. It encompasses art, customs, creative expression and the social fabric of everyday life. In the case of First Nations, Métis and Inuit cultures, core cultural values are enabled through practices, institutions, ceremony, customs, languages and distinctive idioms (Matunga 2013: 26). To fuse culture and architecture requires engaging deeply all of the above. Re-operationalisation of culture is underway; however, it is marked by cautiousness and carefulness. The practice of architecture needs to embody a spirit of generosity, of time and patience, to bring

together the people, their stories and the remaining physical evidence into a collective and living kit of parts.

Te Aranga assists in clarifying broad cultural concepts into actionable steps. Two principles, provided here, are aimed at constructing authentic cultural narrative in the built environment. The first, *Mahi Toi*, is defined in general terms as *art* and *craft*. The goal of *Mahi Toi* is to capture narratives creatively and appropriately. This includes ancestral names, sites and landmarks, and creatively re-inscribing these elements into landscape, architecture, interior design and public art. The principle further states that mandated design professionals and artists should be engaged in the process. Three application-based solutions for *Mahi Toi* are identified: establish design consortia equipped to translate cultural narratives; re-investigate urban (or shared) landscapes to reflect cultural identity and contribute to sense of place; and re-inscribe cultural narratives in the environment through public art and design.

The second culturally aimed principle in *Te Aranga* is *Whakapapa*. It is defined in general terms as *genealogy*. This principle recognises ancestral names as entry points for exploring and honouring ancestors, historical narratives, customary practices of site development, and for building ‘sense of place’ connections. The application of *Whakapapa* is achieved through three activities: consultation and research on the use of correct ancestral names; recognition of traditional place names in signage and wayfinding; and development of names to inform the design process.

Outcome Two: Environmental Quality and Quantity

The deep association between First Nation, Métis and Inuit people and their environment, whether viewed through the concept of relational world view (Cajete 2000) or collective stewardship (Jojola 2008) or other means, requires exploration and advocacy in design. Care needs to be taken to avoid romanticised environmental assumptions of Indigenous sustainability (Matunga 2013: 24). Moreover, Indigenous people need to define the ‘duty of care’ that suits their community and that corresponds to their other desired outcomes (economic, political, social and cultural). Three environment principles from *Te Aranga*, work to strengthen and nurture the human–nature relationship and are a voice for environmental preservation for future generations.

Taiao is defined as *natural world* and is aimed at protecting, restoring and enhancing the natural environment. Applications include: creating and connecting ecological corridors; planting Indigenous flora in public and private spaces; selecting plants to attract native birds; planting for biodiversity; and establishing traditional food and cultural resource areas.

The second environmental principle, *Mauri Tu*, is defined as *life essence* and is aimed at environmental health including the physical resources of water, energy and air. Architecture and planning can be assessed through their ability to enhance the life principle, where natural resources are actively monitored, and energy and

material are conserved. Applications include: restoration of waterways, remediated soil, rainwater collection, greywater recycling, passive solar design and the incorporation of materials and landscape with high cultural value.

The third Te Aranga principle unites environmental and cultural protection. *Tohu*, or to *preserve and conserve*, recognises the value of protecting significant sites and cultural landmarks. Four applications are identified: uphold the preservation and conservation of sacred sites, mountains, water bodies, gardens, food sourcing places and ancestral settlements; establish, preserve and enhance visual connection to significant sites; ensure design responses (buildings and orientation) are informed by landmarks and their associated narratives; and finally, create heritage trails, markers and interpretation boards as part of development.

Outcome Three: Political Autonomy and Advocacy

This outcome centres on power-sharing with state and agencies, and building autonomy and advocacy into the development process. Political autonomy is addressed in the Te Aranga principle of *Mana*, which is defined as *mandate or jurisdiction*. Mana provides a platform for working relationships based on cultural values and world views. The Māori principle has two applications: identifying all Māori interest groups in any given development and the establishment of high-level treaty-based relationships prior to finalising design approaches.

Advocacy was identified by Matunga as a sixth outcome, entitled ‘Support from Within the Community of Planners’. It is integrated here, as it can be seen to work towards the same overall goal: bringing awareness of, and advocacy to, Indigenous voices in the built environment. The first step is for the community to self-define their priorities and goals. Professionals in the field can then become advocates in transferring local, regional and national planning responsibilities and assisting in the growth of this field (Matunga 2013: 26).

Outcome Four: Economic Growth and Distribution

First Nation, Métis and Inuit economics are often linked to an asset base, such as land or resources. The asset base empowers communities to rebuild economically. In line with traditional economics, the aim of this outcome is to ensure the proceeds of resources are shared. As with all other outcomes, economic priorities need to be defined internally and will require negotiation with other outcomes such as social well-being and environmental protection (Matunga 2013: 25).

The *Ahi Kā principle*, or *continuous occupation*, contained within Te Aranga, affirms that tribes are guaranteed a living and enduring presence and are secure and valued within their territory. They are enabled to live, work and play within their community. The principle further states that Māori should resume their stewardship

role in urban areas. Applications of Ahi Kā include: access to natural resources (species, food sources, waterways, etc.); enhancing Māori authority over land and resources; the establishment of joint (tribal-municipal) venture developments ensuring a sense of place; and the establishment of joint (tribal-private) venture developments to enhance employment.

The work of Boussora can be overlaid to expand the Te Aranga principle of Ahi Kā. Boussora's work aims to reinstate local economies and local resources (i.e. materials, labour and technology) through architecture and construction in Algeria. This mission resonates with the prioritisation of economic well-being within First Nation, Métis and Inuit communities. Architectural-economic strategies include: a detailed assessment of local economic factors (funding available, comparative cost of building materials, and methods); a survey of materials and the relevant labour available, including the number of people with traditional, local crafts skills; and finally, an assessment of training or new skills needed (Boussora 1990). Boussora's recommendations could be reviewed as potential workforce development strategies for Indigenous communities in North America.

Outcome Five: Social Cohesion and Well-Being

The aim of social cohesion is to improve well-being across all indices including: housing, health, welfare, education and social equity (Matunga 2013: 24). Two Māori core beliefs, which underlie the Te Aranga principles, have socially invested outcomes. *Whanaungatanga* is defined as *kinship*, or connecting as one people (Auckland University of Technology 2007). It references a relationship through shared experiences and social obligations (kinship, familial, friendship or reciprocal). It provides people with a sense of belonging and is based on the notion that the strength of the group strengthens each individual. The other Māori value is *Kotahitanga*, defined as *unity*. Other terms associated with this are: solidarity, cohesion and collaboration. *Kotahitanga* has been traced back to a movement of national Māori kinship groups in the late nineteenth century in New Zealand (Māori Dictionary 2007).

Referring to the work of Boussora, who prioritises distinct social needs and spatial norms in cultural architecture, it is seen that social cohesion is a vital mode of establishing cultural continuity in traditionally based societies. Social requirements are culturally determined, and for this reason, building types may not transfer from one culture to another (Boussora 1990). To counteract this, Boussora proposes a survey method built into the process of architecture. The survey will assist the architect in understanding needs of the current local lifestyle, defining the pattern of daily activities, and reassessing building types based on the lifestyle survey.

Indigenous Projects in Canada

The following section highlights three projects in the emerging field of Indigenous architecture in Canada. While these projects engage very different approaches, they offer invaluable insight for practitioners and scholars into the field. These projects employ both catalysts and outcomes, and represent the work of both Indigenous and non-Indigenous architects. The projects have been recognised for their contribution to the body of architecture in Canada and have received accolades worldwide.

The distinctions include: Governor General Medal for Excellence in Architecture, National Urban Design Award Medal by the Royal Architectural Institute of Canada (RAIC), Award for Planning Excellence by the Canadian Urban Institute of Planners, Award for Innovation in Architecture (RAIC), and a category winner at the World Architecture Festival in Barcelona. One of the projects featured here was the first architectural practice to receive a Progressive Aboriginal Relations award by the Canadian Council for Aboriginal Business (CCAB), a recognition rewarding the level of collaborative development with Aboriginal stakeholders.

The select buildings are documented in chronological order. The first is the Nk'Mip Cultural Centre (2006) by Bruce Haden of DIALOG architects for the Osoyoos Indian Band in British Columbia. The second is the Gathering Circle and Spirit Garden (2012), designed by Brook McIlroy, and part of the waterfront redevelopment of Prince Arthur's Landing in Thunder Bay, Ontario. The final building, the Gordon Oakes Red Bear Student Centre (2016) designed by Douglas Cardinal Architect, is located in Saskatoon, Saskatchewan, on the University of Saskatchewan campus.

The Nk'Mip Desert Cultural Centre

DIALOG Architects, Osoyoos, British Columbia

Built in 2006, the Nk'Mip Desert Cultural Centre is situated within a unique Canadian landscape within the territory of the Osoyoos Indian Band. The site has been described as a pocket desert and is home to endangered plant and animal species, complete with prickly pear cactus, scorpions and rattlesnakes. The unique climate and desert landscape was a major driver for the project. The project has received a number of prestigious awards including the Royal Architectural Institute of Canada Award for Innovation in Architecture, the Governor General Medal for Excellence in Architecture, and category winner at 2008 World Architecture Festival in Barcelona.

The main façade is the largest rammed earth wall in North America, measuring 80 Metre (262.5 Feet) long, 5.5 Metre (18 Feet) high, and 600 mm (23.5 Inch) thick (Malnar and Vodvarka 2013). The wall resembling strata of the earth has



Fig. 8.1 Nk'Mip Cultural Centre (rammed earth wall) (Photograph Nic Lehoux)

become its most recognisable feature. Both the client and architect aimed to capture the notion of *land*. The firm's goal was to 'present the Osoyoos Band's long tenure on the land', while the client was striving for something 'breathtaking, but with very little footprint on the land' (Weder 2008). The result is striking. The building clearly prioritises its desert setting as a major driver and, in doing so, facilitates understandings of local values (Fig. 8.1).

The cultural centre program is equally powerful in its engagement with the desert environment. The entry sequence begins at the midpoint of the massive rammed earth wall, moving visitors from the exterior public plaza, through a dramatic oversized corten steel door. Beyond the door, there are 50 km of interpretive walkways, punctuated by small interpretive pavilions, a reconstructed pit house and numerous sculptures. The interior of the building contains an interpretative centre a theatre and an amphitheatre.

Catalyst: Architecture as Place

The Nk'Mip Desert Cultural Centre is grounded in the exploration of place. It guides the exterior expression, the programming, and outlines a sustainable philosophy. By capitalising on *place*, this project powerfully articulates the local world view, an innate driver in the human–nature relationship. It blurs the role of the architect as the leading character, or protagonist of the architectural story, to the



Fig. 8.2 Nk'Mip Cultural Centre (site context) (*Photograph* Nic Lehoux)

land becoming the leading character. Through the land emerges the building, and not the reverse. In line with Indigenous learning methods, one becomes embedded within the story of the land. The entwining of land, plants, humans and geological time, as represented by the strata of the wall, is intentional. The story is one of inter-dependence with other living things (Fig. 8.2).

Architecture as Outcome: Environmental, Cultural and Economic Narratives

The Nk'Mip Desert Cultural Centre is inspired by the ethnoarchitectural tradition of the pit house. Engrained in this historic structure is a host of time-tested sustainable principles. In this fragile desert ecosystem, where extreme temperatures fluctuate between hot, dry summers and cool winters, local earth building techniques and green roof covering assisted in stabilising temperature fluctuations. This project moves towards a valuable direction in First Nations, Métis, and Inuit architecture: extrapolation of sustainable principles from traditional precedents.

The building goes beyond passive design strategies such as orientation and passive solar, to include a number of restorative strategies. The project actively serves to re-establish habitats, including incorporating a water management strategy and education tools to familiarise visitors with Indigenous fauna and flora (Weder 2008). This building illustrates how architecture can serve to protect, restore and

enhance environmental health. It exemplifies *Taiao* (natural world), *Mauri Tu* (life essence) and *Tohu* (preserve and conserve).

The dynamic form of the centre conveys Chief Clarence Louie's vision for the Osoyoos Indian Band. He is a proponent of both cultural narrative (*Mahi Toi*) and embedded genealogy (*Whakapapa*). The Chief requested that every detail of the development was marked by culture. Signage is written in the local language and describes the significance of the land, wildlife and history. Local hiking trails are complete with traditional Osoyoos structures including the tule-mat tipi, a pit house and a sweat lodge (MacDonald 2014).

With economic resilience as a primary driver for all projects in the community, the band has become one of the most prosperous First Nations in Canada. In line with his economic goals, Chief Louie has worked to ensure band members were invited to partake in the construction of the cultural centre, developing local skills and adding to the economic sustainability of the region. Osoyoos Indian Band has a number of tourism, construction and recreation companies, including Nk'Mip Wine Cellars, the first Aboriginal-owned winery in North America. There is virtually no unemployment among the band's 520 members.

The Nk'Mip Desert Cultural Centre embodies a resilient vision: it conveys a vigorous architectural language, it is based on enviro-cultural values, and it enables visitors to partake in the natural world. The building epitomises *place* and is robust in its outcomes. It has created an enduring narrative that will have impact far beyond its Canadian desert setting (Fig. 8.3).

Gathering Circle and Spirit Garden, Prince Arthurs Landing

Architect: Brook McIlroy, Thunder Bay, Ontario

The Gathering Circle is part of Prince Arthur's Landing, a waterfront mixed-use redevelopment in the City of Thunder Bay. The development is designed to re-connect the downtown area with Lake Superior (see Welch 2012; Rochon 2013). Lake Superior is one of the five Great Lakes of North America, the largest group of freshwater lakes on earth. Opened in 2011, the project has received a number of prestigious architectural, landscape architecture and urban design awards; including the National Urban Design Award Medal (RAIC), the Award for Planning Excellence and Aboriginal Community Planning (Canadian Institute of Planners (CIP)), and the Canadian Urban Institute Best Large Scale Project. Brook McIlroy is the first architectural practice in Canada to receive a Progressive Aboriginal Relations designation offered by the Canadian Council for Aboriginal Business (CCAB). The award highlights the unique level of collaboration with the Aboriginal stakeholders on this project.



Fig. 8.3 Nk'Mip Cultural Centre (interior) (Photograph Nic Lehoux)

In the centre of the Spirit Garden, there is an eighty-foot diameter, open-air pavilion referred to as the Gathering Circle (Canadian Institute of Planners 2012). Its use of arched, truss-like columns drives the aesthetic impact. The technique is derived from local bentwood building. The pavilion accommodates a number of cultural activities including: music, storytelling, ceremony, blessings, dance and



Fig. 8.4 Gathering Circle and Spirit Garden (*Photograph Calvin Brook*)

theatre. Designed to celebrate culture in an urban context, it has become a major landmark, informing visitors and residents of the influence of Indigenous culture in Thunder Bay (Fig. 8.4).

Catalyst: Architecture as Sovereignty and Transformation

The most important impact arising from this project is its recognition of the missing Aboriginal history in the design of Canadian urban environments. The committee for the Royal Architectural Institute of Canada noted that the project brought forward “a history that was previously invisible to a large percentage of Thunder Bay’s population” (Royal Architecture Institute of Canada 2012). Similarly, when the Canadian Institute of Planners described the contributions of this project, the committee mentioned the lack of tangible expression of Aboriginal culture within the city.

Similar to many Canadian communities, Thunder Bay has a significant and growing Aboriginal population. While an important part of the community’s past and future, there is no tangible physical expression of Aboriginal cultures within the city. No public places, objects or installations exist that one could clearly point to as a place that signified the important and proud culture of the Anishinabe

communities who have inhabited the shoreline and adjacent areas for 9 000 years (Canadian Institute of Planners 2012).

With an increasing number of Indigenous people relocating to urban environments, urban design opportunities, and their potential impact, are increasing. Projects such as this announce to the rest of the world that Aboriginal culture matters and should be celebrated. Moreover, urban projects, such as the Gathering Circle, hold tremendous value to assist First Nations, Métis and Inuit peoples in working through issues of identity and belonging within an urban context (Fig. 8.5).

This project exemplifies the manner in which a project can be a catalyst for transformation. The Gathering Circle is an exploration of the ways in which architecture can give back and redress past injustices. It enabled an architectural-cultural narrative by engaging local Indigenous designers to craft the story and empowered authentic architectural-art strategies by employing local Indigenous artists. The process typifies architectural-economic best practices by supporting local construction technology and expertise, and facilitated architectural-social vitality by creating a venue for cultural activities to take place. The project supports architectural-political (sovereignty) strategies through engaging a community organisation to guide and direct the process. All the while, the project celebrates its nature-inspired setting, bringing to life the architectural-environmental priorities of the local Indigenous peoples. The Gathering Circle aims for broad transformations in attitudinal thinking and societal change and should be viewed as an exemplar in advancing Indigenous architecture.



Fig. 8.5 Gathering Circle and Spirit Garden (view within the city) (Photograph Calvin Brook)

Architecture as Outcome: Cultural, Environmental, Social and Political Narratives

In terms of cultural outcome, this project is exemplary in crafting an authentic narrative. Its success can be attributed to the high level of outreach by the architects. Working alongside local community members, the architects translated narratives, investigated urban landscapes and re-inscribed the narratives into art and design. All three applications of *Mahi Toi* (art and craft) are achieved.

Both the Canadian Council for Aboriginal Business and the Canadian Institute of Planners recognised the unique level of engagement in this project. What this level of outreach gives to a project, and to the field of Indigenous architecture, is an authentic and enlarged understanding of a place. It allows designers to move away from literal motifs, and commonly used references, allowing layers of subtle associations to emerge, “abstraction to breathe, and the power of nature to resonate” (Rochon 2013). These are aspiring aims in architecture.

The design of the Gathering Circle evolved from a series of workshops with representatives from the Fort William First Nation, Robinson Superior Treaty Communities, and the Red Sky Métis. Adding to the process of honouring Indigenous contributions, a number of individuals and organisations were invited to participate. First, Aboriginal designer, Ryan Gorrie, an Ojibway architectural intern who studied at University of Manitoba, became the champion of the pavilion. He sought ways to express a process of decolonisation in architecture (Rochon 2013). Collaborations were also undertaken with local Aboriginal artist, Randy Thomas. Thomas was invited to design the steel laser-cut panels which can be seen on the outer wall of the circular drum-shaped concrete retaining wall. Finally, an Aboriginally owned organisation, Aboriginal Strategy Group, was responsible for designing and leading the engagement process (Fig. 8.6).

In its aim to re-inscribe cultural narratives, the Spirit Garden explores the four sacred elements: fire, water, earth and air. This exploration serves both the local community, by engaging sacred values, and serves the visitors through a process of sharing a living story of this landscape. There is a fire pit, with a seating area and viewing platform, referred to as the *Fire Circle*. The *Living Shoreline* (water) creates four unique wetland zones, characteristic of the Thunder Bay region. The *Medicine Garden* (earth) focuses on growing traditional herbs. Finally, the *Open-air Pavilion*, open to the sky, represents air.

The nature-inspired form brings into focus the surrounding context. The materiality, the local bentwood structure, integrates into the local environment, evoking building traditions that are resoundingly of this place. The site becomes energised as a series of patterns and planes in play with both nature and the urban backdrop:

The shroud is a ‘light-catcher’—a patterned surface of overlapping, divergent planes that enables views through its wooden frame onto the adjacent waterfront as well as the city’s downtown area. By night, a network of soft lighting highlights the curving, luminous shell form that can be seen from many vantage points throughout the City. The bentwood shroud transforms depending on the season and time of day (Rinaldi 2012).



Fig. 8.6 Gathering Circle and Spirit Garden (steel cut panels by local artist) (*Photograph Calvin Brook*)

In terms of environmental narratives, the project epitomises the Te Aranga environmental principle of *Mauri Tu*, or life essence. There are low impact areas of development and materials with high cultural value (cedar and spruce). The local building technique, made possible by employing a local master craftsman, versed in bentwood craft, brings a powerful narrative to this project. The narrative is about time and our Canadian history: it brings forward historical forms, and with it, the story of the people, of this place:

The spruce was harvested in the summer, the bark stripped off and the wood bent into structural trusses immediately after. Much of the bentwood tradition has been lost, so the architects were forced to look hard for a knowledgeable craftsman. They found a builder living in British Columbia, who returned to his native Fort William First Nation to craft the spruce trusses (Rochon 2013).

Through the involvement of a broad group of stakeholders, a platform for reciprocal working relationships was formed. This is power-sharing, and this is what political advocacy in architecture looks like. The simple act of hiring an Indigenous organisation, such as the Aboriginal Strategy Group to design and lead the community consultation process, can alone be responsible for changing outcomes. These individuals can bring the right people to the table, ask the right questions, and create a setting for true engagement to happen (Fig. 8.7).



Fig. 8.7 Gathering Circle and Spirit Garden (bentwood tradition) (*Photograph Calvin Brook*)

The Gordon Oakes Red Bear Student Centre

***Douglas Cardinal Architect with RBM Architecture,
Saskatoon, Saskatchewan***

Douglas Cardinal, a Métis and Blackfoot architect, is well known in North America. His previous commissions include the Canadian Museum of Civilization, the First Nations University of Canada and the Smithsonian's National Museum of the American Indian. His work has been acknowledged internationally, and he has been given the title of World Master of Contemporary Architecture by the International Association of Architects.

The current project occupies a prominent position on the University of Saskatchewan campus. Completed in 2016, the 1884 m² curvilinear structure houses the Aboriginal Students Centre, as well as offices, a lounge, a computer resource centre and a hospitality area. The building provides a place for vital cultural activities such as dance, ceremony, lectures and social gatherings. It has become an important resource for the growing First Nations, Métis and Inuit student populations, currently estimated at 2200 students or 11% of the total student population (Fig. 8.8).

The building is named after Gordon Oakes, also known as Redbear, a well-respected Saskatchewan Elder who passed away in 2002. Oakes' story serves



Fig. 8.8 Gordon Oakes Red Bear Student Centre (exterior) (*Photograph Douglas Cardinal Architect*)

as a reminder of the critical interrelationship between education and spirituality. Redbear, a former Cree Chief, who lived within the small community of the Nekanee band, did not attend school, preferring to retain a traditional lifestyle and shunning mainstream society (CBC News 2016). Despite this lifestyle, Gordon’s son, Larry Oakes, says their father felt “education and spirituality should be like a team of horses pulling together” (Green 2016). This relationship is precisely what Douglas Cardinal was aiming to achieve in the design of the new facility.

This project offers a timely message regarding the role of culture in education. The Truth and Reconciliation Commission of Canada (2008–2015) was established to respond to the trauma that many First Nations’ children and families have suffered as a result of the Indian residential school legacy. Between 1870 and 1996, 150,000 Indigenous children were removed from their families, to be educated in line with a Western educational curriculum. The commission’s call to action includes a directive to higher education institutions to increase the participation rate of Aboriginal students in post-secondary education and to find ways to integrate aboriginal history and knowledge into the curriculum (The National Centre for Truth and Reconciliation 2015). Douglas Cardinal attended residential school, and his aim with this building is to articulate the changing role of education. His vision is “a drum in one hand and a computer in the other” (Green 2016).

The building offers a number of lessons for the study of Indigenous architecture. Through its process emerges a story of the vitality of sociocultural traditions alive today. Its cultural outcome, particularly the Te Aranga cultural principle of *Mahi*

Toi, or art and craft emerges in a powerful package, in an equally powerful setting. While Indigenous architecture can fall prey to an overabundance of ideas, compromising clarity as it meanders multiple layers of meaning, Cardinal's Gordon Oakes Center stays true to the architects' signature language, unapologetically announcing to the world that culture matters.

Catalyst: Architecture as Kinship

Community, or kinship, is a vital ordering device in Indigenous architecture. The traditions that uphold community—whether they come in the form of a support system, a method of value preservation, or a building—provide the structural basis of culture and guarantee its continuity. The province of Saskatchewan has the highest per capita Aboriginal population in Canada, yet the University of Saskatchewan suffers from low Aboriginal retention rates. First- and second-year student retention rates fluctuate between 55 and 65% (Dawson 2012).

A sense of community and a support network on campus are two key factors identified as critical to the retention of First Nation, Métis and Inuit students (Dawson 2012). The Gordon Oakes Centre serves that purpose, bringing together support services, and packaging it in a form that is inspiring to the students: “the new student centre will provide a welcoming cultural setting for Aboriginal students coming from various communities and backgrounds and will help these students integrate into the university's learning environment” (Dawson 2012). The aim of creating campus or urban environments that are ‘welcoming’, is an understated goal in Indigenous architecture.

Honouring community values weighed significantly in crafting the final design of the building. Paul Blaser, the local project architect, recalls the first reveal to the community. Part of the initial design involved a sloping courtyard to connect the building to the universities underground tunnel system, a common feature in cold-climate design. Blaser says: “I fully expected we would be cheered as heroes [but] it was completely quiet. Then one of the elders started talking and it was a story about how her father would say, ...never go more than a shovelful into the ground when you're building your fire” (Blaser quoted in Green 2016; Choise 2016). As Blaser further explains, “...each of the six or so elders there told a story in turn, every [story] a version of the first ... building on one another until they had made a clear point that it is not the right thing to dig into the ground and have a lower level. But they never said that, they only told stories” (Blaser quoted in Green 2016).

Fortunately, the architects acknowledged the magnitude of these cumulative stories. The communication method was indirect, but the message was heard. The architects created a setting for listening, allowing lessons to emerge through story, and the values of this community to be upheld. As Blaser remarked, “the building would have fractured the stories and symbols it was intended to embrace, thereby disconnecting it from the very people it was designed for” (Blaser quoted in Green 2016). In the end, there was only one option: Cardinal and Blaser redesigned the

building. The revised building sits above ground, and the surplus soil created by the site work creates a giant earth drum upon which the building sits.

Architecture as Outcome: Cultural and Political Narratives

One of the vital outcomes of this project is the declaration of culture. The project, with its curvilinear form, is a clear departure from the campus' predominantly Gothic-inspired architecture. According to the Assembly of First Nations National Chief Perry Bellegarde:

People from around the world, around this country will ask what does this mean? Why are these colors like that? Why are there doors to the east, south, west and north here? What's the significance of it being on mother earth, the connection to the land? All those things are questions. It's a way of educating, not only ourselves to keep these things going, but to people throughout the world (Bellegarde quoted in CBC News 2016).

Cultural design narratives are found in every aspect from the orientation to the mechanical exhaust system. Some of the design features include: a nonlinear spatial organisation, a star blanket pattern on the skylight, a medicine wheel painted ceiling and a south-facing orientation which symbolises the migratory north–south flow of life in northern Cree traditions. Even the mechanical exhaust system is symbolic; it collects pipe and smudge smoke from a number of spaces and brings it to the centre, and then parts it to the four directions to release it out of the building (Green 2016) (Fig. 8.9).



Fig. 8.9 Gordon Oakes Red Bear Student Centre (interior) (Photograph Douglas Cardinal Architect)

Viewed from Te Aranga, Mahi Toi, the building employs a number of culturally driven applications. First, by enlisting a well-known Blackfoot/Métis architect, the team is well equipped to translate narrative. Second, the shared landscape is driven by a cultural narrative. According to Cardinal, it is designed as a lodge, to express the spiritual buildings of Indigenous cultures (Cardinal and Blaser 2016). There is also a narrative of cultural identity, as Cardinal writes, the facility is designed to “tell the stories of who we are and who we desire to be” (Cardinal and Blaser 2016).

Third, Cardinal engages cultural art and design in a comprehensive manner. He does so through form, pattern, material selection and detailing. The limestone is from Tindall, Manitoba, selected in a buff colour to represent the buckskin blanket. The stone beads on the exterior add to the blanket effect, while multiple natural colour variations signify the four directions. The stone, which represents grandfather stone, is designed to contrast with the blue anodised aluminium frames and glass, which represents grandmother water. Maintaining the integrity of the architects’ sculptural form required close collaboration between the architect, a detail architect and a mason contractor (Fig. 8.10).

By reaching far beyond historical or Western precedents, and aiming instead, to define a blend that is both about continuity and contemporary expression, the Gordon Oakes Centre is a manifestation of sovereignty. While the university deserves credit for supporting the development of an Indigenous centre on campus



Fig. 8.10 Gordon Oakes Red Bear Student Centre (interior) (*Photograph* Douglas Cardinal Architect)

(an act of power-sharing or *Mana*), the sovereign intent is driven home by Cardinal's signature organic architecture, pushing the dialogue forward in its proud and prominent declaration. A master of originality, disconnecting himself from popular stylistic constraints, once again Cardinal secures his position, leading the charge for an architecture of Canada, and of this place.

Conclusion

At a time when many institutions—educational, corporate and political—are struggling to incorporate diversity, Indigenous architecture is a beacon. Representing 1184 diverse cultures in North America, there are transferable and transformational lessons beyond culture and beyond architecture. Our role as practitioners is to find ways to assist communities in capturing the vitality inherent in their ancestral environments, in a contemporary setting.

This chapter is an exploration of approaches in Indigenous architecture, particularly catalyst and outcome. It is a conversation, leading to questions as opposed to answers. Can these tactics assist in identifying community-driven priorities? Are notions of catalyst and outcome useful in accelerating design discourse? Can they provide direction to the multi-directional meandering inherent in Indigenous architecture? Do they articulate margins for more in-depth explorations? Three Canadian projects—the Gathering Circle at Prince Arthur's Landing, the Gordon Oakes Student Centre and the Nk'Mip Cultural Centre—offer generous subjects of study.

The cultural lens of architecture brings to life intangible and qualitative undercurrents and provides opportunities for analysis. It is intended that this chapter will propagate additional catalysts, outcomes and perhaps other means of strategising transformation in cultural architecture, adding to the construct of a (spoken) language in Indigenous architecture—a way of speaking to the world—a story that occurs through architecture.

References

- Auckland University of Technology. (2007). *Te Aka Online Māori Dictionary*. <http://Maoridictionary.co.nz/dictionary-info>. Accessed 2 December 2016.
- Benton-Banai, E. (1988). *The Mishomis book: The voice of the Ojibway*. Hayward: Indian Country Communications.
- Bingler, S., & Pederson, S. (2014). How to rebuild architecture. *The New York Times*, 14 December 2015. http://www.nytimes.com/2014/12/16/opinion/how-to-rebuild-architecture.html?_r=0. Accessed 2 December 2016.

- Boussora, K. (1990). Regionalism: Lessons from Algeria and the Middle East. In V. Canizaro (Ed.), *Architectural regionalism: Collected writings on place, identity, modernity, and tradition* (pp. 127–128). New York: Princeton Architectural Press.
- Brown, T., & Wyatt, J. (2010). Design thinking for social innovation. *Stanford Social Innovation Review*, 31–35 (Winter).
- Cajete, G. (2000). *Native science: Natural laws of interdependence*. Santa Fe: Clear Light Publishers.
- Canadian Council for Aboriginal Business. (u.d.). *Progressive Aboriginal Relations (PAR)*. <https://www.ccab.com/programs/progressive-aboriginal-relations-par/>. Accessed 2 December 2016.
- Canadian Institute of Planners. (2012). *The Spirit Garden, 2012: Awards for Planning Excellence—Aboriginal Community Planning & Development Category*. https://www.cip-icu.ca/Files/Awards/Planning-Excellence/CIP2012-Awards_-_Spirit-Garden-Submission.aspx. Accessed 2 December 2016.
- Cardinal, D., & Blaser, P. (2016). Tribute to Indigenous cultures. Stories expressed in stone at University of Saskatchewan. *Smart: Dynamics of Masonry*, v2.5. <http://www.saskmasonry.ca/wp-content/uploads/2016/03/Tribute-to-Indigenous-Cultures-Article.pdf>. Accessed 27 March 2017.
- CBC News. (2016). Gordon Oakes Redbear Student Centre opens at U of S, *CBC News*, Saskatoon. <http://www.cbc.ca/news/canada/saskatoon/gordon-oakes-centre-opens-1.3431386>. Accessed 2 December 2016.
- Choise, S. (2016). University of Saskatchewan Student Centre Celebrates Indigenous Culture. *The Globe and Mail*. <http://www.theglobeandmail.com/news/national/university-of-saskatchewan-student-centre-celebrates-indigenous-culture/article28523485/>. Accessed 27 March 2017.
- Dalla Costa, W. (2016). *Contextualized metrics and narrating binaries: Defining place and process in indigenous North America*. Paper presented at the at the Association of Collegiate Schools of Architecture annual conference, Cross-Americas: Probing Disglobal Networks, Santiago, Chile, 29th June–1st July 2016.
- Dawson, A. (2012). Fitting in and moving up: Culture shock behind low Aboriginal student retention rates. *The Sheaf*. <http://thesheaf.com/2012/03/29/fitting-in-and-moving-up-culture-shock-behind-low-aboriginal-student-retention-rates/>. Accessed 27 March 2017.
- Doshi, B. (1985). Cultural continuum and regional identity in architecture. In V. Canizaro (Ed.), *Architectural regionalism: Collected writings on place, identity, modernity, and tradition* (pp. 111–118). New York: Princeton Architectural Press.
- Graveline, F. (1998). *Circle works: Transforming eurocentric consciousness*. Halifax: Fernwood Publishing.
- Green, J. (2016). New student centre features the distinctive curves of architect Douglas Cardinal. *University Affairs, University of Saskatchewan*. <http://www.universityaffairs.ca/features/feature-article/douglas-cardinal-leaves-his-mark/>. Accessed 2 December 2016.
- Hillman, L., & Salter, J. (1997). Environmental management: American Indian knowledge & the problem of sustainability. *Forest, Trees & People: Newsletter 34*. <http://www.magicriver.ne>. Accessed 2 December 2016.
- Jojola, T. (2008). Indigenous planning. *Canadian Journal of Urban Research*, 17(1), 37–47.
- Kovach, M. (2009). *Indigenous methodologies: Characteristics, Conversations and Contexts*. Toronto: University of Toronto Press.
- MacDonald, J. (2014). How a BC native band went from poverty to prosperity. *The Globe and Mail*. <http://www.theglobeandmail.com/report-on-business/rob-magazine/clarence-louie-feature/article18913980/>. Accessed 2 December 2016.
- Malnar, J., & Vodvarka, F. (2013). *New architecture on Indigenous lands*. Minneapolis: University of Minnesota Press.
- Matunga, H. (2013). Theorizing indigenous planning. In R. Walker, T. Jojola, & D. Natcher (Eds.), *Reclaiming Indigenous planning* (pp. 3–32). Montreal: McGill-Queen's University Press.
- Ministry for the Environment. (2005). *Te Aranga Māori Principles*. http://www.aucklanddesignmanual.co.nz/design-thinking/Māori-design/te_aranga_principles. Accessed 2 December 2016.

- Pallasmaa, J. (1988). Tradition and modernity: The feasibility of regional architecture in post-modern society. In V. Canizaro (Ed.), *Architectural regionalism: Collected writings on place, identity, modernity, and tradition* (pp. 129–139). New York: Princeton Architectural Press.
- Pettit, K., Kingsley, T., Biess, J., Kassie Bertumen, K., Pindus, N., Narducci, C., et al. (2014). *Continuity and change: Demographic, socioeconomic, and housing conditions of American Indians and Alaska Native*. Washington: Department of Housing and Urban Development. https://www.huduser.gov/portal/publications/commdev/housing_conditions.html. Accessed 24 April 2017.
- Rinaldi, M. (2012). *Gathering Circle at Spirit Garden by Brook McIlroy and Ryan Gorrie*. <http://aasarchitecture.com/2012/11/gathering-circle-at-the-spirit-garden-by-brook-mcilroy-and-ryan-gorrie.html>. Accessed 2 December 2016.
- Rochon, L. (2013). Thunder Bay's revitalized waterfront: A declaration that Aboriginal culture matters. *The Globe and Mail*, 18 January. <http://www.theglobeandmail.com/arts/art-and-architecture/thunder-bays-revitalized-waterfront-a-declaration-that-aboriginal-culture-matters/article7516689/>. Accessed 2 December 2016.
- Royal Architecture Institute of Canada. (2012). *National Urban Design Awards: 2012 Recipient*. <https://www.raic.org/raic/national-urban-design-awards-%E2%80%94-2012-recipient-8>. Accessed 2 December 2016.
- Semken, S. (2016). Place, culture and geoscience. Lecture presented at Arizona State University, 17 November 2016.
- Shubow, J. (2015). Architecture continues to implode: More insiders admit the profession is failing. *Forbes*, 06 January. <http://www.forbes.com/sites/justinshubow/2015/01/06/architecture-continues-to-implode-more-insiders-admit-the-profession-is-failing/>. Accessed 2 December 2016.
- The American Institute of Architects. (2015). *Look Up Campaign*. <http://www.ilookup.org/>. Accessed 2 December 2016.
- The National Centre for Truth and Reconciliation. (2015). *Honouring the truth, reconciling for the future: Summary of the final report of the Truth and Reconciliation Commission of Canada*. Winnipeg: University of Manitoba.
- UN Permanent Forum on Indigenous Peoples. (2008). *Who are indigenous people?* New York: United Nations.
- UN Permanent Forum on Indigenous Peoples. (2009). *State of the world's indigenous peoples, ST/ESA/328*. New York: United Nations.
- Weder, A. (2008). Nk'Mip Centre Shimmers in Desert. *The Tye News*. <http://thetyee.ca/Life/2008/10/22/NkMipCentre/print.html>. Accessed 2 December 2016.
- Welch, A. (2012). Prince Arthur's Landing, Canada: Thunder Bay waterfront. *e-Architect*, 5 December 2012. <http://www.e-architect.co.uk/canada/prince-arthurs-landing-thunder-bay>. Accessed 2 December 2016.

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