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An **architectural response** to Durban's existing **car culture** to promote **social** and **economic development**: towards the design of a **multi-purpose motorsport facility**

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Declaration

This dissertation is a presentation of my own original work.

Where contributions of others are involved, every effort is made to acknowledge this clearly, with due reference to the literature and discussions.

This dissertation is being submitted to the College of Humanities, School of Built Environment and Development Studies at the University of KwaZulu-Natal, in partial fulfilment of the requirements towards the degree of Master in Architecture.

This dissertation has not been previously submitted for any examination or degree at any university.

Signed:

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Priyen Chetty

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Dedication

THIS DISSERTATION IS DEDICATED TO MY PARENTS – CINDY AND SAGREN – AND BROTHER AND SISTER – SUMESHEN AND LAVANYA.

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I HOPE I MADE YOU PROUD

Abstract

Owing to the non-existence of a dedicated automotive facility in Durban, car enthusiasts have been forced to use spaces which are not designed for the purpose of facilitating related activities, such as drag racing, drifting and car shows. These uncontrolled, social, 'third' spaces have become notorious for illegal racing activities and social issues which include violence, motor vehicle accidents and the consumption of alcohol in public spaces.

Conversely, twenty four years into democracy, South Africa is still one of the most unequal societies in the world. It is argued that poverty and unemployment levels are in a state of crisis and could disrupt the socio-economic stability of the country. The lack of skilled personnel is one of the major contributors to social immobility and poverty in South Africa. Education and skills development have been identified as the key to alleviate poverty and create employment opportunities. Skilled entrepreneurs create job opportunities, which employ skilled employees, which in turn create sustainable livelihoods.

Therefore, this study will explore Durban's car culture and identify the social and economic development opportunities in order to empower society through architectural spaces. The literature, precedent and case studies explored are underpinned by social and architectural theories. The research herein will inform the design of a multi-purpose motorsport facility in Durban.

Key words: car culture, empowerment, architectural tectonics, social integration, place making, tectonic space, informality

Contents

List of illustrations

Definition of terms

Culture: (noun) the ideas, customs, and social behaviour of a particular people or society.

Informal car culture: (Usually with negative connotations) a society or way of life characterized by excessive use of or reliance on motor vehicles. *(https://en.oxforddictionaries.com/definition/car_culture)*
For the purpose of this dissertation, the term car culture will be used sociologically to describe the ideas, customs and social behaviours linked to the automobile in terms of values, vehicle modifications and deviant driving behaviours such as illegal street racing, drifting etc.

Motorsport facility: A building complex used primarily for automotive activities.
For the purpose of this dissertation, the term motorsport facility will be used as a space where motorsport activities and skills development are integrated.

Empowerment: is the ability of an individual to bring upon change to one's own life and is generally done through mediating structures within the built environment. (Rappaport, 1987)

Illegal Street racing: The practice of partaking in illegal motor racing activities on public roads.

Drifting/spinning: Drifting is a technique whereby a driver intentionally causes the rear wheels of a vehicle to lose traction which consequently throws the car in the opposite direction. A technical definition of drifting is when the wheels of the rear slip angle is greater than the front slip angle to such an extent that often the front wheels are pointing in the opposite direction to the turn. (http://www.willship.com.au/what-is-drifting/) It is a growing sport around the world and is commonly linked to the act of "spinning" in South Africa.

Subcultures: (noun) a cultural group within a larger culture, often having beliefs or interests at variance with those of the larger culture.

Third Spaces: For the purpose of this dissertation, third spaces are interpreted as spaces that were designed for activities outside of motorsport but are however used by automotive enthusiasts which leads to uncontrolled, unsafe motoring activities. These spaces include public roads, parking lots, fuel stations etc.

Social Mobility: is the movement of individuals, families, households, or other categories of people within or between social strata in a society. It is a change in social status relative to one's current social location within a given society.

Chapter 1 Introduction

1.1 Introduction

1.1.1 Background

The automotive industry is globally one of the largest contributors to economic and socio-economic security (Bronkhorst, Steyn and Stiglingh; 2013). In 2015 the industry in South Africa accounted for 7.2% or R59.4 billion of the total gross domestic product (GDP) of South Africa. The industry currently employs around 900 000 people, and reports suggest that around four million people are dependent on the industry (iol; 3 March 2017). The scale of the automotive industry in South Africa can be seen with the 12 027 860 registered vehicles on South African roads (Wheels24, 28 March 2017) which prompted the manifestation of an ever expanding informal car culture.

Due to the non-existence of a dedicated automotive facility in Durban, car enthusiasts have been forced to use spaces which weren't designed for the purpose of facilitating related activities, such as drag racing, drifting and car shows. With this, these uncontrolled, social, 'third' spaces have become notorious for illegal racing activities and social issues which include violence, motor vehicle accidents and the consumption of alcohol in public spaces. These issues have in-turn placed the car culture in Durban under constant media scrutiny. It is evident that car culture is growing in South Africa, particularly in Durban with negative connotations tarnishing the reputation of what could potentially be a major contributor to social mobility.

Conversely, twenty four years into democracy, South Africa is still one of the most unequal societies in the world. It is argued that poverty and unemployment levels are in a state of crisis and could disrupt the socio-economic stability of the country (Masutha and Rogerson 2014; 47). The lack of skilled personnel is one of the major contributors to social immobility and poverty in South Africa. It has a crippling effect on society and can be attributed to the deliberate exclusion of the demographic

majority to education and entrepreneurship during the apartheid regime (Moorosi 2009; 111). Education and skills development have been identified as the key to alleviate poverty and create employment opportunities. Skilled entrepreneurs create job opportunities, which employ skilled employees, which in turn create sustainable livelihoods (Kraak, et al. 2013).

Owing to the lack of education and development, poverty will always be at the forefront of South Africa's social inequalities. The automotive industry offers an opportunity to empower people with the required knowledge in order to build a sustainable livelihood by. This study will focus on how a dedicated, multi-purpose motorsport facility can facilitate and respond to the growing car culture in South Africa whilst empowering society through automotive skills development.

1.1.2 Motivation

The automotive industry in South Africa has grown substantially which has fuelled the growth of various subcultures which include all facets of car culture together with the growth of untrained and unqualified motor mechanics. In addition, education and skills development in South Africa are some of the key factors in alleviating poverty as the labour market is currently characterised with low levels of skills (Kraak, et al. 2013).

The spaces used by automotive enthusiasts entice youth from all walks of life as the automobile in South Africa has become a symbol of success and progress, particularly within the peri-urban and rural communities. Utilizing the social construct of the culture created around the automobile to empower youth can promote skills development and create opportunities for economic sustainability.

With advancement in engineering technology, the need for skilled practitioners within the automotive industry has grown. The South African Government has made considerable commitments to supporting the growth of small, medium and micro enterprises (SMMEs), (Masutha and Rogerson 2014, 48). This however can only

work if society is able to gain the necessary skills and education to sustain the government's agenda of facilitating SMMEs.

Hence, architectural spaces can play a vital role in the facilitation of skills development by creating spaces that promote development and education by interpreting and implementing the subcultures within the automotive industry that have manifested organically. A motorsport facility can provide a designated space for automotive enthusiasts to partake in motorsport activities which can help curb the illegal racing activities and negative social issues which have plagued the car culture of Durban. The integration of culture and skills may additionally create a system of interdependence by creating opportunities for skilled entrepreneurs and automotive enthusiasts to facilitate the needs of each other.

1.2 Definition of the problem, aims and objectives

1.2.1 Definition of the Problem

The growth of the automotive industry has prompted a car culture which has not been adequately accommodated. Automotive enthusiasts have been using 'third' spaces which are riddled with illegal racing and negative social issues. Ultimately the growth of the automotive industry in South Africa negates the subcultures which have grown with it, by inadequately catering for it. Furthermore, the injustices of the past, together with the lack of knowledge and education among youth have propagated a society which has been burdened with poverty and inequality. The automotive industry, however, has grown substantially and the need for employment and economic stability has instigated an informal sector of motor mechanics. This sector is festooned with individuals who lack appropriate training and certification in order to gain accreditation from the relevant trade associations i.e. The Retail Motor Industry (RMI). This limits the growth of these individuals due to the lack of accreditation as per manufacturer's requirements. This research attempts to bridge the gap created by the automotive industry whilst facilitating skills development.

1.2.2 Aim

The aim of this dissertation is to understand how car culture can influence architectural design, improve social mobility and promote a safe motorsport culture in Durban.

1.2.3 Objectives

The objectives are:

- To explore and understand culture and how it can influence architectural spaces
- To investigate skills development and the fundamental principles of empowerment through architecture
- To generate architectural principles that inform the design of a motorsport facility that integrates car culture and skills development

1.3 Setting out the scope

1.3.1 Delimitation of the problem

Whilst car culture has grown substantially, this research will not focus on the history of it, the aim of this study is to understand how this local culture can influence architectural design in order to facilitate it holistically. Furthermore, there are many issues which have been identified as the root of social inequalities. This study will not focus on the origins of poverty but rather how knowledge and skills can help alleviate it through architecture. Thus, the primary emphasis of this study is within the context of car culture and how architecture can facilitate and promote a safe car culture whilst integrating automotive skills development. The research will focus on culture and skills development whilst investigating the social and economic opportunities a motorsport facility may create. Furthermore, it is evident that car culture has played an historic role in the fabrication of architecture within an international context. The research herein however is not focused on an international context; the aim is to understand how the inimitable South African culture can be integrated with architecture.

1.3.2 Stating the assumptions

It is assumed that automotive activities happen in designated spaces around Durban which poses safety risks on public roads. These automotive enthusiasts are claiming these spaces due to the lack of a dedicated space for automotive activities.

1.3.3 Hypothesis

A motorsport facility may promote skills development within the automotive industry and will help curb illegal racing activities by creating a designated space for motorsport activities.

A motorsport facility can help curb illegal and unsanctioned automotive activities by creating a designated space which embraces car culture. Furthermore, it can empower financially disadvantaged individuals who have been encapsulated by the automobile as a medium of desire and success through skills development.

1.3.4 Key Questions

Primary Question:

How can architecture respond to motorsport culture and facilitate social and economic development?

Secondary Questions:

1. What types of spaces are used by automotive enthusiasts?
2. How can architectural spaces empower people?
3. What architectural principles can be generated to create a motorsport facility that integrates car culture and skills development?

1.4 Concepts & Theories

1.4.1 Introduction

The theoretical framework briefly discussed below sets the foundation of the research and is centred on social and architectural theories. They will be further investigated and interpreted through literature and applied to precedent and case studies.

1.4.2 Theory of Culture

Culture can be perceived in many different ways by contextualising it and understanding the fundamental characteristics of what makes it work. As described by Spencer-Oatey and Franklin (2012) is a notoriously difficult term to define. For the purpose of this dissertation, culture will be reviewed within a social context; that is how it drives lifestyle choices and defines a group of people with similar interests.

Hofstede (1984) states that *"Culture is to human collectivity what personality is to the individual".* He further goes on to say that culture is the programming of the mind which distinguishes the characteristics of one group from another. It is a dynamic phenomenon which changes as society changes be it technological or generational changes.

It is evident that culture in all aspects plays a vital role in sculpting the urban fabric of most modern cities and societies. The architectural challenge is how we can create dynamic spaces which facilitate cultural changes.

1.4.3 Empowerment

Empowerment has been identified as a way to liberate society through development. Rappaport (1987) described empowerment as the ability of an individual to bring about change to one's own life. He further states that this is done through the built environment as a mediating structure.

Zimmerman (1995) implies that empowerment focuses on identifying capabilities rather than focusing on risks or disadvantages. It explores environmental influences of social problems instead of blaming victims. Interventions which utilize empowerment in order to improve wellness focus on providing opportunities for society to develop knowledge and skills and to use the skills developed by professionals as collaborative entities rather than authoritarian ones (Perkins and Zimmerman, 1995).

The theory of empowerment conceptualizes individual growth through self-development. It can be argued that it is the cornerstone of social mobility. By empowering society through knowledge, individuals gain the tools required in order to create opportunities.

1.4.4 Tectonics

Karl Botticher describes architectural tectonics simply as the activity of forming a building. He further states that architecture has previously imitated objects and nature, whereas tectonics noted that the objective of architecture should be the expression of the dynamic and static building forces which hold the building up (Schwarzer, 1993). Frampton (1995) further explains that tectonics within architecture is the science of art within construction and that tectonics is "aesthetic rather than a technological category". He further states that the ontology of materiality and building technology should be expressed through architectural form in order to create architecture that is true to itself.

The theory of tectonics will serve a vital role in the integration of knowledge and architecture. It creates a bridge which links society to architecture and conceptualizes the mechanics of the built form.

1.5 Research Methods

The research carried out in this dissertation focuses on the development of a multi-purpose motorsport facility with emphasis on using car culture as a catalyst for skills development. The research will initially look at published literature pertaining to the theoretical framework as prescribed above. Precedent studies, which focus on buildings/spaces of a similar typology which reinforce the literature discussed have been designed, will follow.

Approach

This research study is of a qualitative nature and will use primary and secondary data in the form of literature papers, books, articles and internal search engines in

order to position the research topic within the current literature. The research gathered will be collated into two tiers. i.e. **Skills development** within the automotive industry and **car culture** in Durban.

Sampling Methods

The sampling method used for this study will be purposive judgmental sampling. This type of sampling allows the researcher to use his/her discretion in order to identify and select appropriate candidates to partake in the study. This allows the researcher to identify tertiary institutions which cater for automotive skills development and to interview facilitators on the impact of automotive skills development with specific focus on space requirements within the current school models. This method will be further used in order to investigate the fundamental characteristics of car culture. People/organisations that play a major role within this community will be identified and interviewed, with emphasis on car culture in Durban and how it can inform architectural design.

The information gathered above will be further analysed, collated and interpreted in order to successfully integrate skills development and car culture.

Secondary Research Methods

Literature Review

Existing literature on the concepts and theories identified by the researcher will be investigated in order to understand the underpinning concept of what defines them. Furthermore, other documents relating to skills development and car culture will be identified and analysed so as to ensure the fabrication of a well-founded and detailed dissertation.

Precedent Studies

Precedent studies will investigate how other structures of a similar typology have been designed and used. The precedent studies will offer insight into how the relevant research has been translated into architectural spaces.

Primary Research Methods

Interviews

Interviews conducted will play a vital role in obtaining information for this particular topic. The interviews will be carried out in two tiers:

1. **Car culture and motorsport**

The second part of the interview process will be carried out within the various spaces as identified by the researcher, wherever automotive activities exist. These include formal and informal areas, such as Umgeni Road and Dezzi Raceway. The purpose for these interviews will be to help conceptualize car culture in Durban and how this can be facilitated within a multi-purpose motorsport facility. Interviews will be done with people, as identified by the researcher, who play a vital role within the car culture of Durban. These will include festival organizers, automotive clubs and automotive enthusiasts.

1. **Skills development and training**

These interviews will be carried out at the Shukela Training Centre which is an automotive training centre located in Mount Edgecombe, Durban. Interviews will be conducted with two facilitators and five students who will be able to outline their lived experience of sharing knowledge through the use of the spaces provided to them. The interview will further investigate if the spaces provided are sufficient to carry out the required training and what types of spaces would positively impact the learning and empowering process of students.

Observations

Observations play an integral part in architectural research. It helps the researcher to understand how people use space and to design accordingly. The method used for observations will be naturalistic observations. This observational technique allows the researcher to observe behavioural patterns in an environment where daily activities occur without obstructing or distracting participants from these activities. Observations will therefore be done in existing skills development centres and spaces identified where automotive activities exist. Observations will be carried out

within the same areas as interviews, to ensure accurate information is being obtained.

Case Studies

Case studies will be conducted within the same areas as mentioned above. The case studies will be used in order to understand and critique the usage of space and how it facilitates the designated and or undesignated usage. This includes site visits, observations and the analysis of architectural plans.

1.5 Outline of the dissertation

Chapter 1 formed the basis of this research. It is evident that car culture has grown substantially within South Africa. Whilst this growth has propagated a range of issues, the social characteristics of it offer an opportunity for society to be empowered using architecture and public spaces as a mediator. The following chapters will focus on the construction of a framework which will inform the design of a multi-purpose motorsport facility.

Chapters two, three and four look at existing literature and research done within the scope of this research. The chapters will be broken up as follows:

- **Chapter 2 Conceptualizing car culture:** the focus of this chapter is to define the fundamental characteristics of car culture through cultural theories.
- **Chapter 3 Empowerment as a means for social and economic development:** this chapter aims to identify ways in which the social construct of culture can be applied and interpreted through architecture whilst empowering society.
- **Chapter 4 Exploiting the mechanics of the built form:** the aim of this chapter is to understand the tectonic value within architecture in order to facilitate the integration of culture and empowerment.
- **Chapter 5 Precedent studies:** this chapter will identify and discuss two key precedent studies which reinforce the content of the literature mentioned in the previous chapters.
- **Chapter 6 Case studies:** in this chapter case studies will be introduced and analysed using the framework as mentioned within the previous chapters.

- **Chapter 7 Analysis and discussions:** this chapter will present the findings from interviews and case studies through the lens of the literature mentioned in the previous chapters. It will also present the findings from the precedents which have been introduced in chapter 5
- **Chapter 8 Conclusions and recommendations:** this chapter will conclude the research and provide recommendations towards the architectural intervention.

Chapter 2 Conceptualizing Car Culture

2.1 Introduction

Car culture throughout the world is growing exponentially and the prominence of the automobile is evident in the urban fabric of the cities in which we live today. In this chapter culture is first briefly defined within a social context. Thereafter, the theory will be applied to the concept of South African car culture, how it influenced architecture and how it can build sustainable livelihoods.

2.2 The automotive influence on global architecture

Vieyra (1979) exclaims that no other technological development had a greater influence on social culture and city development than the car and the internal combustion engine. He further states that since the advent of the automobile, it has generated a range of new building typologies such as fuel stations, diners and motels. This suggests that these building typologies extended the individuals horizon of where he/she could go by providing breaks in journeys along American highways. The prominence of these buildings played a symbolic role in the reflection of what America has become. Vieyra (1979) states that the fuel station was an example of this as it played a key role in paintings by artists such as Edward Hopper whereby it became a focal point in the portrayal of American landscapes. Whilst it can be argued that typologies such as motels and diners purely reflected American car culture, the fuel station has however been adapted to other parts of the world due to necessity.

Frank Lloyd Wright, an architect whose designs were majorly influenced by the automobile described the fuel station as a potential "embryo" for future city design (Bruechert, 2002; 40). Wright believed that the fuel station could serve as a catalyst for a de-centralized America. Furthermore he believed that it could be more than just a space whereby one could purchase fuel; it becomes a "meeting place, restaurant, restroom or whatever else is needed" (Bruechert, 2002; 40).

"Imagine, now, spacious landscaped highways….Giant roads, themselves great architecture, pass public service stations now no longer eyesores but expanded as good architecture to include all kinds of roadside service for the traveller, with charm and comfort throughout"

- *Frank Lloyd Wright, 1945 (Wheeler, 1960, 12)*

Figure 1 Image showing glazed observation lounge and building character (*http://www.duluthnewstribune.com/news/4126163-cloquets-frank-lloyd-wright-gas-station-be-sold)*

Figure 2 Image showing Lindholm service station (*https://franklloydwright.org/site/lindholm-oil-company-service-station/)*

Wright was further commissioned to design the Lindholm Oil Company Service Station in Cloquet, Minnesota whereby he adapted this philosophy of the service station becoming a "social hub". The rationale for this design was to "incorporate a little beauty into an otherwise under-designed space." The design included a cantilevered copper roof, upper level fully glazed observation lounge which allowed for community interaction and sky-lit service bays. Wright had also originally proposed overhead pumps which allow free vehicular and pedestrian movement without interruption. This however had to be revised due to local building codes which stated that the fuel tanks had to be located below ground (Bruechert, 2002, 41).

Figure 3 Image showing the evolution of the fuel station (*http://www.2oceansvibe.com/2016/04/25/watch-shell-garage-employees-kick-the-crap-out-of-this-guy-video/)*

Figure 4 Image showing the evolution of the fuel station **(***https://www.snupit.co.za/randburg/central/sasol-service-station/158217)*

Fuel stations have since evolved into replicated structures with forms unique to the correlating fuel companies. This creates a space which becomes easily identifiable by the commuter, which in-turn provides a familiar space, in an unfamiliar area, in a decentralized city. Architects such as Robert Venturi, Denise Scott Brown and Stephen Izenour describe this as "architecture as a symbol" (Vieyra. 1979; xiv) whereby people are drawn to familiar spaces which hold symbolic and/or familiar meaning.

The above suggests that architecture has been influenced by American car culture for a period. This however, is not the primary focus of this study. Therefore it becomes of paramount importance to identify and conceptualize South African car culture in order to holistically facilitate it.

2.3 Defining Culture

In order to conceptualize car culture, one needs to understand the basic principles of what constitutes culture and how to identify it. Rapoport (1969: 49) states that religion formed an essential part of most primitive cultures. These cultures created symbolic meanings and provided design generators for the microcosms of primitive settlements. Current literature, as explored below, suggests however, that with advancements in technology and society, culture has evolved into a term which can also be used to identify and conceptualize a group of people within a social rather than religious context. Abumere (2001) compares the notion of culture to that of

society; she notes that although the two can be conceptually different, they share similarities. She further goes on to define society as a system of relationships which connect individuals. Members of societies are seen as part of an organized structure based upon unique cultures, thus it is suggested that cultures cannot exist without society and vice versa.

Culture, as identified by Hofstede, Hofstede, and Minkov (2010:6), is a collective phenomenon; it is shared by people who come from analogous social environments and is something that is learned, rather than a genetic force.

These can be seen as the social qualities of cultures, the way in which it defines a group of people who characteristically participate in similar activities. Although cultures manifest themselves in a number of ways, there are four main pillars that fundamentally hypothesize the concept of culture:

- **Symbols** can be made of words, images, jargon and objects which are only familiar to those within a specific social standing and cultural influence
- **Heroes** are people, living or dead, who have been praised within a specific cultural system. These are people who would have contributed to the lifestyle created by the phenomenon and serve as models and aspirations for the behavioural and materiality characteristics of social groups
- **Rituals** are seen as collective activities which define a set of people. These rituals can take the form of greetings, activities and social actions.
- **Values** are seen as the core principles of culture. These are generally paired with an intangible, contradicting principle e.g. good versus bad, legal versus illegal, dangerous versus safe etc. (Hofstede, Hofstede & Minkov2010:7).

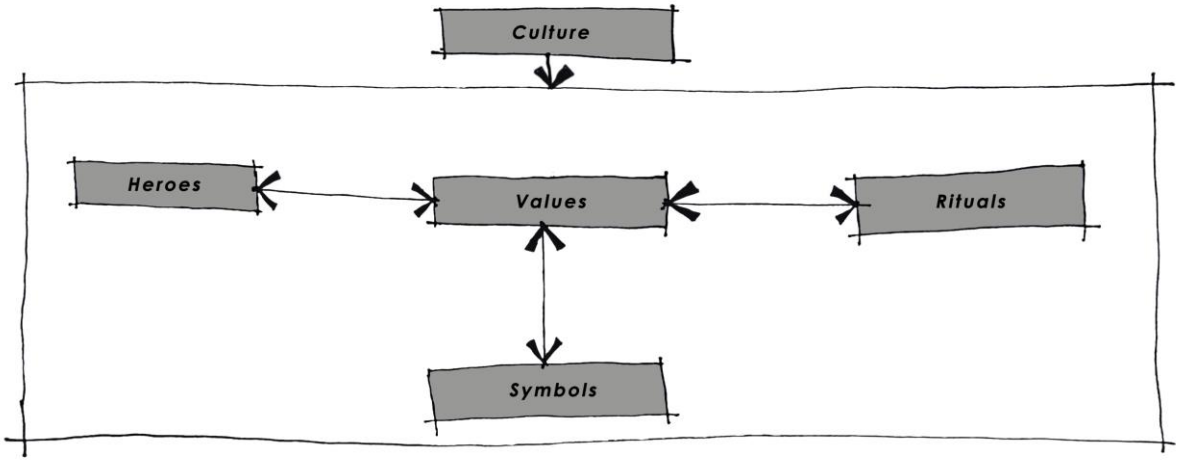

Figure 5: Image showing the hierarchy of cultural principles
(By author, 2018)

The diagram above illustrates the way in which the first three cultural attributes mentioned above (symbols, heroes and rituals) are layered around the core principle, which are the "intangible" values. Symbols, heroes and rituals can be seen from the outside, but they may not be understood by people outside the social group. They hold significance for those within the relevant source group and can be incorporated into architectural interventions.

Cultural Identity

While the term cultural identity is a complex term, it has been broadly defined as the understandings that people have about who they are and what is meaningful to them (Abumere,2001; Simpson, 2017). Abumere (2001) further identifies two forms of identity, viz. social identity and self-identity.

Social Identity

Social identity is the identity which is portrayed to society by an individual. Examples of this can be seen as doctors, mothers, fathers, homeless etc. It is further noted that within social identity, an individual can attain identities comprising of multiple attributes; for example a mother who is simultaneously a doctor. It is evident that social identity reflects the dynamics of society; whilst an individual could share a single identifying attribute with another, it is the collective social identity attained by an individual which ultimately defines a person.

Self-Identity

Abumere (2001) further goes on to define self-identity as the process of self-development. This can be translated into educational development, gender roles, sexuality etc. It is also defined as a set of personal values, ideas, philosophies and beliefs. She further states that it is the individual's interactions within a social construct which ultimately shape the sense of who he or she is. Therefore it can be argued that a person's upbringing and socio-economic context defines their character.

2.4 Constructing Informal Car Culture

Informal car culture can be seen as the culture formed around the car. Using the four concepts of culture mentioned in the previous section, the following section aims to construct the defining principles of car culture.

2.4.1 Symbols

The defining symbol and identifying the prominence of car culture would be the car itself. Garter (2004) explains the three eras which defined the symbol of the automobile as a consumer object and the social implications it had on society. These can be seen as:

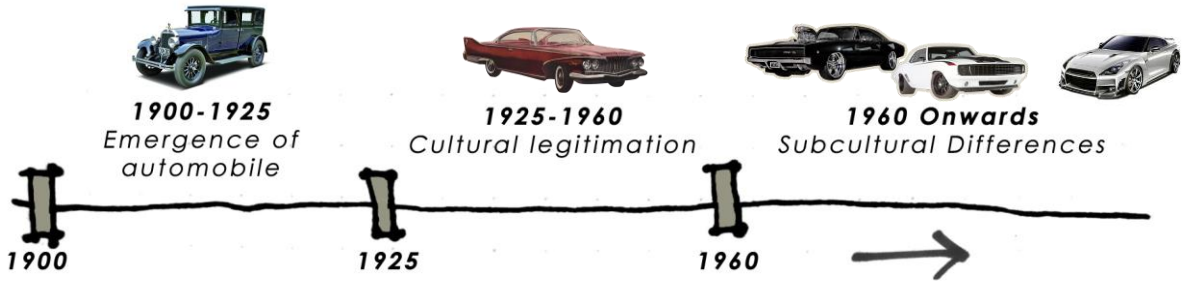

Figure 6: Timeline showing eras of automobility
(by author, 2018)

- **The era of class distinction** (1900-1925); the emergence of the automobile which was too expensive for the middle and lower class society which began dividing society and becoming a status symbol.
- **The age of mass individuality** (1925-1960); the period when manufacturers moved away from the homogenous, rectilinear mass produced vehicles which

symbolised the rigid forms of the past and started creating vehicles which facilitate cultural legitimation and mass consumption.

- **Era of subcultural differences** (1960 onwards); this was a time when the car was viewed as part of a variety of subcultures, the automobile became a symbol of individuality and prompted the culture of customization and vehicle modifications which consequently propagated a range of youth orientated and performance vehicles.

The three eras of automobility mentioned above are still justified within society today. Graves-Brown (1997, 68) argues that the car is as much a symbol of status as it is a symbol of community and identity; whilst Hatton (2007) describes the way in which society uses the automobile to signify individual difference through mass individuality whilst working class youth take to modifications of the same vehicles in order to show individualism and rebellion against mass consumption.

2.4.2 Heroes

Macullum (2005) postulates that heroes within society are generally recognised as prestigious and worthy of admiration as role models. These heroes are generally encountered through the media and are most often sport stars, pop stars, actors or fictional characters. The notion of "heroes" is perceived by a person's desired goal and social standing. It is therefore evident that heroes are dependent on the cultural heritage of an individual and people aim to imitate these heroes.

Figure 7 Race pilot Ken Block with his modified vehicle partaking in a form of ritual, in a controlled environment. (*https://www.whichcar.com.au/news/ken-block-testing-his-hoonicorn-mustang-v2)*

Gossling (2017) states that the evolution of car culture has been greatly influenced by the heroes within popular culture as fast, aggressive driving has been idolised in movies such as *"The Fast and the Furious"* and *"Gone in 60 Seconds"*. He also

suggests that the concept of being a good driver relates to the admiration of race pilots who are able to manage high powered vehicles at high speeds.

> *"In The Fast and the Furious movie and its sequels, muscle cars are constructed as exceptionally powerful examples of 'American muscles'. In the following example, the muscle car alludes to the particular emotional value associated with the movie's hero, Dominic Toretto. In the first movie, 'Dom' drives his deceased father's black 1970 Dodge Charger, a 900-horsepower car that he at first did not dare to drive, because it 'scares him'. One interpretation is that this car, associated with his deceased father, represents the patriarchal power associated with the father figure. Like fathers, the muscle car is constructed to demand the respect of younger generations. In this particular case, it is cars like these that may test whether the son is 'man' enough to match what the father was once capable of"*
>
> (Balkmar, 2012, 151).

The text cited above shows that the automobile has been personified as a hero and described as a totemic object and has been personified as an extension of the human being. (Lumsden, 2015). With the impact the car has on society and the dominant role it plays within automotive culture, it can be argued that the car itself is a metaphoric hero; it has become a symbol of aspiration, success and worship.

2.4.3 Rituals

Car culture is fundamentally rooted in activities in and around the automobile. Lumsden (2013) linked the sector of informal car culture to the label of 'boy racer'; one who partakes in deviant driving behaviours and car modifications. She further states that these deviant behaviours involve illegal street racing and speeding. The label also combines themes of youth, masculinity and deviant behaviour associated with the automobile.

Figure 10: Flyer for an event in Durban, showing part of the rituals. *(https://www.facebook.com/EthekwiniMotorFestival/photos/)*

Figure 8 A modified vehicle as part of the rituals (*https://www.teamvvv.com/en/news/comments/Gymkhana-7-will-tear-up-Los-Angeles-in-a-modified-Mustang-next-week)*

Figure 9 Deviant driving behaviour and illegal street racing *(https://www.google.co.za/imgres?imgurl=)*

Lumsden (2015) further describes the automobile as an object that is central to the ethos and rituals involved within car culture. This is however not a homogenous activity, car cultural ethos and rituals differ among various social groups.

An example of the foregoing can be seen within Durban's car culture. It has been plagued with the perception that the ethos and rituals of automotive enthusiasts is of a rebellious nature due to the deviant and illegal ritualistic activities which have organically manifested. However, an article published by Sunday Tribune (2017) suggests that automotive enthusiasts in Durban participate in deviant driving behaviour on public roads due to the non-existence of a motorsport facility within the precinct.

2.4.5 Values

The above mentioned concepts of culture are seen as the tangible, visible characteristics to social groups outside of car culture. Values within this context are the intangible individualities within a cultural group and are usually paired with a contradicting principle from unrelated social groups. Frey (1994) defines values as *"learned, relatively enduring, emotionally charged, epistemologically grounded and represented moral conceptualizations that assist us in making judgements and in preparing us to act."* The underlying principle of this is that the priorities and choices that define an individual or a society are based upon the values instilled within them. He further identifies three overriding criteria in which values can be defined.

Literal-denotative values are literal, tangible values which propagate upon the physical senses such as sight and sound. An example of this would be the use of the car within car based communities; it is seen as an object of mechanical marvel which is usually modified to assert individuality and uniqueness, conversely to "outsiders" the car is merely a functional object made up of steel, glass and rubber (Sheller, 2004).

Metophoric-Connotative values are values based on metaphoric principles and have abstract meanings which are categorically subjective to individuals within a given social standing. Whilst people within car based communities look at the car as an aesthetic wonder which is an extension of the human body, others simply see it as a machine for travel.

Anagogic-implicative values are similar to the above mentioned; they are figurative, abstract meanings, although spiritual. They can be seen as supernatural or divine revelations. As mentioned in the previous section, to automotive enthusiasts the car is seen as a totemic object and is central to the values surrounding the culture. On the contrary, others may have little or no spiritual attachment to the car.

Car culture within the South African context involves a range of various activities such as street racing, organised car shows, vehicle modifications, drifting and spinning and a range of charity based events. It can be argued that car culture, although formed organically, has deep roots which categorically define a group of people known as automotive enthusiasts. It is, however, evident that related, unsafe rituals occur on public roads due to the non-existence of a facility which caters for them.

2.5 The relationship between (hu)man and machine

The previous section outlines the prominence of the automobile within society and suggests that since the emergence of the automobile, there has been a manifestation of a profound informal culture fabricated around it. A large part of culture, however, is embedded in the way in which cultural groups use commodities (Carrabine and Longhurst, 2002); hence the understanding of the relationship between man and machine becomes paramount within the context of car culture.

Balmar (2012) put forward the views that the symbolic relation between man and machine is culturally significant and anthropomorphised through socialisation with these machines from a young age. This suggests that the feelings which cars may provoke are not located solely within a person but occur as the effects of different cultural backgrounds and historical geographies of automobility act on an individual. This anthropomorphic relationship between car and driver is interpreted as a form of social being, where one cannot act without the other.

The automobile is as much of an illustration of globalization as cinema, television and computers. Urry (2000) explains that it is the dominant manufactured object among some of the leading companies within 20th century capitalism and is the predominant form of private mobility which creates opportunities for society to engage in activities such as work, family life, leisure and pleasure. From this, it can be argued that the automobile enhances our ability to extend the possibilities of what we are able to do. He further explains the way automobility gives the user a sense of freedom by being available 24 hours a day and allows open ended travel, along

preconceived routes, which leads to societies unexpectedly finding new places and explorations.

Litman and Laube (2002) define this as automobile dependency; i.e. societies dependence on the car. They further state that this directly benefits vehicle users, but also has a positive impact on local economies. Businesses are able to use centralized distribution systems and are able to access a wide range of customers and employees due to this form of mobility. They further state that automobile dependant societies are those that lack suitable public transport systems. An example of this can be seen in South Africa due to the poor, deteriorating public transport system which has plagued the country for decades (Pillay. 2001).

> *"As a consequence of the motor car and collateral inventions, the horizon of the individual has immeasurably widened. It is significant that not only have space-values entirely changed with the new standard by that the new sense of spacing based upon the man in his motor car is now at work in" spite of him upon the man himself… it is this new view of the horizon that gives him the desire to go. If he has the means to go he goes. And he has the means- his car. His horizon keeps widening as he goes. The physical release is at work upon character.*
>
> *-Frank Lloyd Wright, 1969*
>
> *Cited from Bruechert (2002, 5)*

It is evident that the emotional investment that humans have in machines surpasses that of it being purely a functional commodity. Machines have sculpted society and extended the reach of the human race through mobility. It can be argued that South Africa, as an automobile dependent society, can use this as an opportunity to improve local economies by facilitating the car through urban and architectural interventions.

2.6 Car culture as a driver for sustainable livelihoods

The previous sections outlined the importance of the machine in the way society has evolved over time. It has been suggested that the car has the potential to promote

economic opportunities; thus the implementation of (car) culture to create sustainable livelihoods becomes a driving factor in how this material commodity can be used to promote economic opportunities. Scoons (2009) defines sustainable livelihoods as the ability of an individual to empower, sustain and cater to one's needs and wants through self-driven actions.

Ramocka (2010:118) emphasizes that culture is forwarded through symbols, with the core of culture being the values. She further compares the relationship between culture and economic growth to the relationship of the roots of a tree and one of its largest branches. This suggests that economic development is rooted within cultural societies.

Duxburry et Al (2016) explain that the participation of people in local cultural activities improves their quality of life and enhances opportunities and options. They further state that cities should use cultural resources to catalyse social and economic change to improve developmental potential.

It can therefore be assumed that within the context of car culture, the informal symbols, rituals, heroes and values that have been formed around the car should be implemented within the built environment in order to catalyse social and economic growth.

2.7 Conclusion

This chapter explored the fundamental principles of what constitutes car culture and the effects it has on modern day society. It is evident that the role of the car within car based communities extends beyond the mere functional usage. It has further been found that culture forms the basis of sustainable livelihoods and economic growth within urban environments and social groupings. Thus, car based communities have the ability to empower via the principles of car culture to develop sustainable livelihoods.

Chapter 3 Empowerment as a means for socio-economic development

3.1 Introduction

South Africa's social mobility and personal growth has been majorly compromised through the injustices of the past. It is evident that potential for social and economic development can be found in the automotive sector, together with the subcultures which have grown with them through automotive skills development. This chapter will focus on how empowerment through learning can be established within culture whilst using architecture as a mediator.

3.2 Empowering society through development

As mentioned in chapter 1, Rappaport (1986) defines empowerment as the ability of an individual to bring about change to one's own life. Thus, it can be said that the fundamental principle of empowerment is the ability of a person or society to improve and increase their social mobility. South Africa has been regarded as a society that has low levels of skills and high unemployment levels (Mummenthey, 2010). Thus, it can be argued that this directly impacts the basic needs required in order for individuals to create sustainable livelihoods. In order to understand the basic needs required to increase social mobility, one needs to understand the fundamental needs of the human being. *Maslow's Hierarchy of Needs* hypothesizes the basic requirements in order for the individual to survive and grow.

3.2.1 Maslow's hierarchy of needs

First coined in his book entitled *A Theory of Human Motivation, 1943,* Abraham H Maslow defines eight levels of fulfilment that one needs to attain in order to be sufficiently motivated and facilitate a sustainable livelihood.

The image below represents the hierarchy of needs as proposed by Maslow. The base of the pyramid suggests the most basic needs that need to be acquired. As an

individual progresses vertically, the needs evolve to create a self-sustaining system of life.

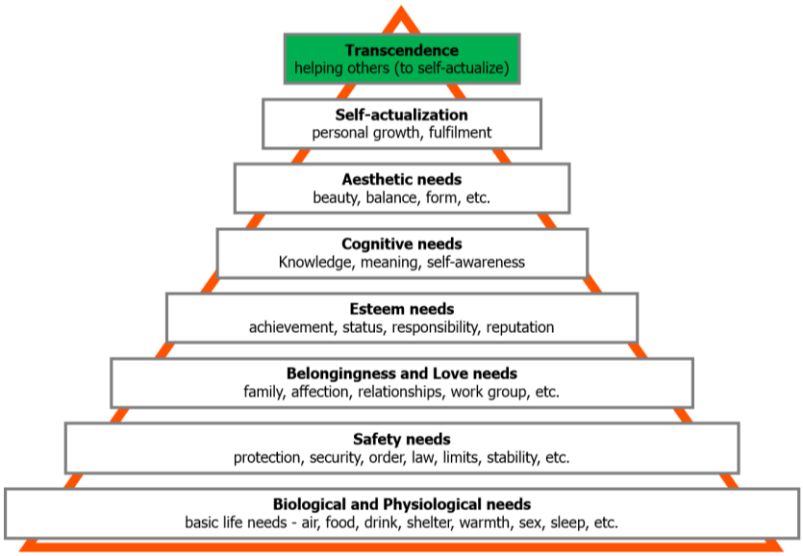

Figure 11: Maslows Hierarchy of Needs (*https://changecom.wordpress.com/2016/05/16/maslows-hierarchy-of-needs-motivational-model/)*

- Tier 1: Biological and physiological needs are needs that the human body needs in order to survive. These are the most basic necessities, such as air, food, water, shelter etc.
- Tier 2: Safety Needs are required in order to prevent physical harm and endangerment. These can be seen as protection, security, laws etc.
- Tier 3: Belongingness and love can be defined as the social needs; these involve family, relationships, work etc.
- Tier 4: Esteem Needs is the need to achieve status and responsibility, this can be within a social group or community
- Tier 5: Cognitive Needs are the needs formed on the basis of knowledge and learning; this fundamentally propagates the need for an individual to learn and be taught.
- Tier 6: Aesthetic needs in the form of beauty and form
- Tier 7: Self-Actualization refers to personal growth and achievement. It can be said that this refers to educational and social standings.

- Tier 8: Transcendence is the notion of assisting, teaching or bringing about change to the lives of others.

For the purpose of this study, the focus will be on tiers 4-8. It is evident that a cycle emerges once transcendence has been achieved. It can be suggested that individuals who have achieved transcendence have the ability to help others improve social mobility and impart knowledge realised. The hierarchy of needs as postulated by Maslow suggests that the inclusion of these processes must be incorporated within learning institutions. Thus, the following section aims to explore how the built environment can facilitate the growth of individual skills within the automotive industry whilst drawing on the social traits of subcultures which have formed.

3.3 Situated learning theory

Stein (1998) defines situated learning theory as a learning approach which is a sociocultural phenomenon rather than the action of a student learning in a purely theoretical space with preconceived notions appropriated by a facilitator. Three main characteristics can be used to define the situated learning theory.

(1) *"legitimate peripheral participation"* as defined by Lave and Wenger (1990) state that learning becomes more natural when it is situated within authentic activities, cultural and contextual environments. They further state that learners begin learning by observing participating members of the community on the periphery of social activities; thereafter through learning and socialising they move from the periphery of these communities and become contributing members of society.

(2*) "Community of practice"* as defined by Hansman (2001) is the manifestation of a self-organized group of people with common goals. This practice is generally informal in nature and is constructed through social interactions between people with similar interests. The notion of this suggests that people meet informally to share knowledge of what each other knows.

(3) *"Knowledge needs to presented in authentic contexts".* Stein (1998) explains that context within situated learning must mirror the environment that students need to

achieve in order to be successful in practice. He further states that context embraces the cultural characteristics of communities which allow learners to be at the centre of experiences which shape learning and knowledge.

For the purpose of this dissertation, it is evident that the notion of integrating car culture and skills development is of paramount importance. The introduction of spaces conducive to the socialization of learners and members of the car based community creates a system of interdependence, where each can learn from the other.

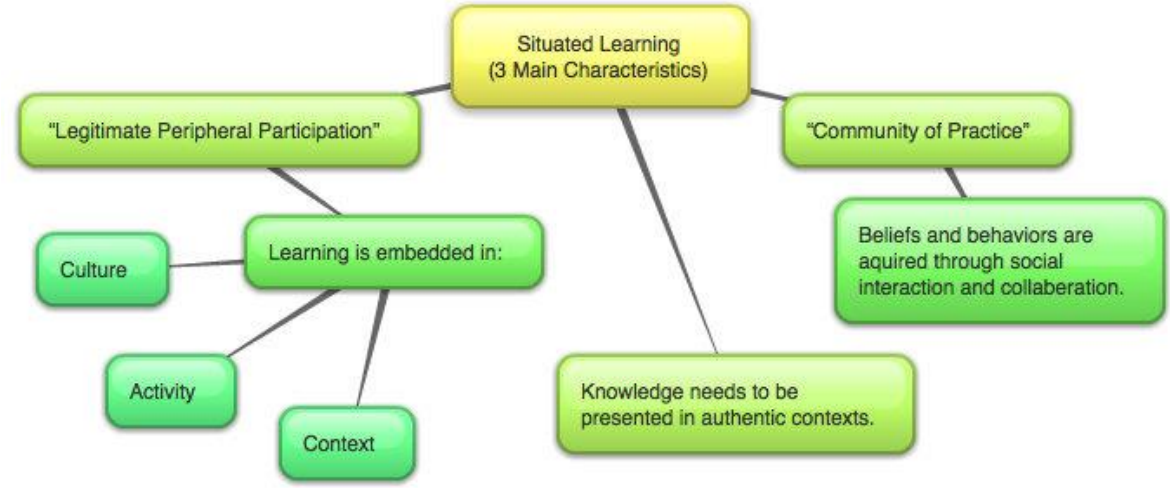

Figure 12 Diagram showing situated learning theory (*http://mwm091200.wixsite.com/antologia-blog/mapa-conceptual)*

Figure 13 Aerial image showing Tuner School (*https://tunerschool.com/)*

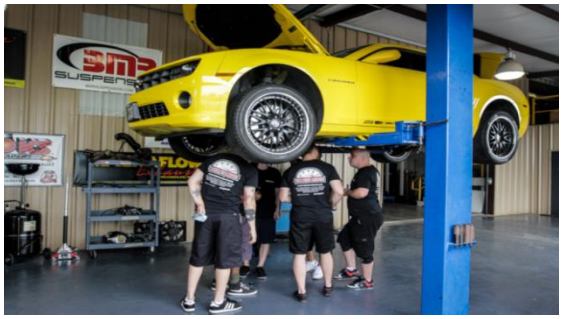

Figure 14 Showing internal space of Tuner School (*https://tunerschool.com/)*

An example of this can be seen in Tuner School which is based in Texas. Globally, it is the only facility of its kind. The objective of this school is to teach students the principles of modifying a vehicle within an authentic environment. It is located next to a drag circuit which is used by the students to test the vehicles and host various race days. The placing of this facility within an authentic context creates gathering of likeminded people with common interests and allows the pollination of ideas among

students and users. Hansman (2001) suggest that this learning approach also favours the teaching methods of internships, apprenticeships and formal and informal mentorships where learning whilst working creates a foundation of knowledge.

3.4 Translating knowledge into practice

The attainment of knowledge can be associated with the self-actualization level of Maslow's Hierarchy of Needs. The above section explains the way in which the social aspect of learning can be interpreted. A major contributor to socio-economic development, however, is the utilization of this knowledge constructively in a professional environment.

"Business incubators" as defined by Buys and Mbwewana (2007) are an initiative that provides a wide range of services for start-up businesses. These include secretarial support, floor space and equipment, counselling and assistance with research and development. These are provided to start-up businesses on a temporary basis, at low rental. The fundamental principle of business incubators are that they allow for small businesses to grow over a limited period of time with reduced risk. Masutha (2014) suggests that the establishment of a network of business incubators forms an essential step for the enhancement of local development. Furthermore it has been found that across developing countries, business incubators allow the country to grow its entrepreneurial base.

Buys and Mbwewana (2007) further state that the success of this initiative is dependent on three contributing factors which impact the scope of this study.

- Business incubators need to be set within conducive environments within an urban context.
- Access to science and technology expertise plays a vital role towards supporting infrastructure.
- Networking of like-minded individuals through knowledge shared both from achievement and failure is essential.

It therefore can be assumed that business incubators form the basis of the transcendence phase. Within the context of this study, students who have completed the statutory levels of studies have the opportunity to become entrepreneurs. This in-turn offers opportunities for current students to partake in apprenticeships and mentorship programs within these businesses, thus completing the cycle of Maslow's Hierarchy of Needs.

3.5 The architecture of learning

Current design standards of institutional spaces have been festooned with the notion that learning happens in a limited set of ways. It is suggested that this instruction-based approach came about from the necessity of accommodating large groups of students at the lowest cost (Gee, 2006). Within the context of this study, learning spaces will be largely dependent on the building accommodation due to the intricacy of equipment and spatial arrangements. This section will therefore focus on the micro design of spaces and look at how learning can be maximized through the built environment.

Gee (2006) suggests human centred design as a key component to learning environments. She further states that people are at the centre of learning, thus their needs must be the epitome of spatial requirements. Furthermore, she has fabricated design guidelines which places people at the centre of design.

3.5.1 Health

- **Lighting:** Lighting of space proves important in tuning the mood and stimulation levels of students. Indirect lighting has been suggested as the best form of lighting within learning spaces; however should augmented lighting be required, different forms of controlled lighting can be introduced. Gee further states that whilst there is no quantifiable research available on the impact of natural sunlight on the learning experience, it does have a psychological impact in that in reduces stress and elevates mood.

- **Ergonomic Considerations:** The fundamental principles of ergonomic thinking are that it should not hurt and it must prevent injury. Ergonomics places emphasis on the entire learning environment, the way in which the built environment interacts with the human body. Due to the diversity of the human body, adaptable furniture and equipment must be considered. In addition well-planned circulation, study and social spaces should be taken into account.

3.5.2 Stimulating principles

- **Sensory Cues:** the learning space should incorporate multisensory experiences; therefore tangible stimulation subconsciously raises mental awareness and allows the user to absorb information learnt within the space. Multisensory experiences can be seen as auditory, tactile and kinaesthetic experiences. The underlying principle here is that what has been learnt can be triggered by a particular sight, smell or sound. It is further noted that humans associate what has been learnt to where it was learned.
- **Elements of surprise:** Surprise stimulates the human mind. The design should consider spaces that facilitate accidental meetings and spontaneous discussions. Informal, well designed "third" spaces help people share ideas and knowledge comfortably whilst networking and sparking new connections.
- **Transparency and visual access:** Visual connections help people feel part of the grander scheme and energize learners. Learning spaces should not be introverted and must have a visual link to the outside. Students and facilitators spend most of the day indoors and it is easy to forget that one is a part of a bigger picture. Within the context of this study it would be important that learners have a visual and social link to the culture which is evident around them.
- **Connection to nature:** Nature's ever changing elements stimulates the mind and provoke positive responses. This connection can be introduced in a literal sense, with direct connection to the natural environment. It can also mimic the characteristics of nature e.g. reflective surfaces associated with water, warm

glows associated with fire (warmth, food and light), low ceilings to replicate the safety and comfort of a tree canopy.

- **Diverse Shapes:** Learning spaces should integrate diverse shapes and forms. The use of geometry assists to symbolise activities within the space.

3.5.3 Adaptability

- **Flexibility:** Spaces provided should allow for adequate flexibility. This should be able to transform from large lecture rooms, to a series of intimate smaller spaces used for smaller group forums and meetings.
- **Adequate space:** In order to create dynamic learning environments, space provision should be of high priority. The movement of furniture and equipment requires a large amount of space. The space designated should therefore ideally facilitate the dynamism of usage.

3.5.4 Social learning spaces

- **Social, community space:** In the previous section, it has been suggested that learning is a social activity, with social spaces connecting people with other people.
- **Opportunities and spaces for socialization:** Classrooms and work areas have the potential to be used as informal meeting spaces. They should therefore be accessible and welcoming to students at all times, thus creating semi private meeting spaces for students within a single class, while designated areas outside of the class can be seen as public spaces for interaction with others from other classes.

  Oblinger and Lamos (2006) extend on social learning spaces and suggest that any space has the potential to become a social learning space should there be a multimedia point with internet connection. Implementing technology ports creates a focal point for spontaneous meeting and impromptu discussions.

- **Refuges and private spaces:** Whilst contradictory to the social learning spaces, private spaces play a vital role in the culmination of knowledge. It has been suggested that these spaces need not become compartmentalized: the strategic placement of furniture can create private spaces. Other ways of defining private spaces is by using retractable screens, plants and seated height panels.

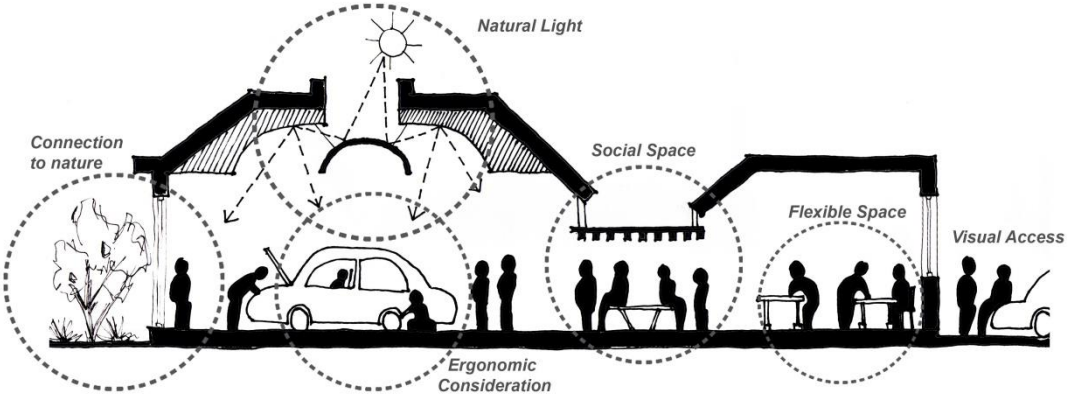

Figure 15 Conceptual sketch showing abovementioned principles
(*By Author, 2018)*

3.6 Conclusion

This chapter focused on the empowerment of society through social interaction. The basic needs required in order to motivate the vertical movement of social mobility forms the basis of what must be achieved. It is clear that learning spaces need to be of a human centred paradigm and facilitate social inclusion and promote spontaneous, social interaction. It is evident that the tectonic form of the architectural intervention has the ability to facilitate the empowerment of society.

Chapter 4 Exploring the mechanics of the built form

4.1 Introduction

Chapter two outlined the importance of the automobile within a social construct and how it has influenced the manifestation of a vast culture which has been poorly catered for. The objective of Chapter three is to identify ways in which this social construct can be translated into an empowering phenomenon and briefly suggested how architecture can facilitate this. The following section aims to explore how this can be further interpreted through architecture via the use of architectural form and spaces.

4.2 A case for the tectonic

4.2.1 The tectonics of the race car

The racing car is the epitome of the motorcar's primary function - movement; it has been designed to push the boundaries of speed and physics in order to extract all conceivable performance. Mount (2004) explains that *Formula One* cars are machines designed entirely for speed and that the performance of the vehicle is only limited by technological and regulatory constraints. The form and mechanical function of these cars directly relate to aerodynamic and performance requirements. However, he further states that the form of the vehicles are not purely a product of rational decisions but also as a result of the designer's intuitive aesthetic. Mount also suggests that ornamental

Figure 16: Low centre of gravity and wide wheel base suggests that f1 cars are designed for circuit racing (*https://f1grandprix.motorionline.com/foto/zoom/2018/TEST_F1_BARCELLONA_27_FEBBRAIO/f1-152/)*

and advertising decals added to the body of these vehicles are an aesthetic compromise and detract from the pure, mechanical form of the car by detracting from the complexity of the inner workings of the mechanical beauty.

"The nearer the automobile approaches its utilitarian ends, the more beautiful it becomes. That is, when the vertical lines (which contrary to its purpose) dominated at its debut, it was ugly, and people kept buying horses. Cars were known as "horseless carriages. " The necessity of speed lowered and elongated the car so that the horizontal lines, balanced by the curves, dominated: it became a perfect whole, logically organized for its purpose, and it was beautiful."

- *Fernand Legar "Aesthetics of the machine: The manufactured Object, The Artisan and the Artist, 1924, 2"*

Figure 17 : High ride height and durable body create identity of rally car (*https://www.ultimatecarpage.com/car/2306/Subaru-Impreza-WRC-2005.html)*

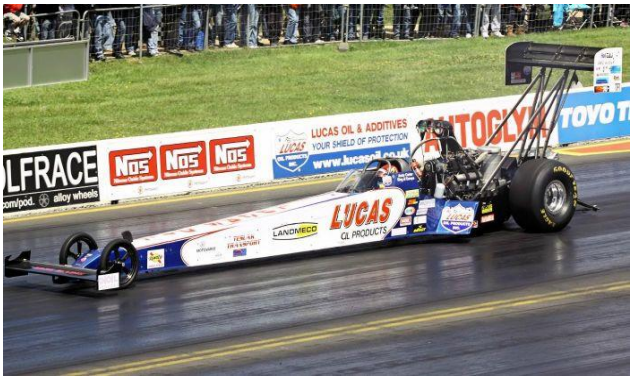

Figure 18 Elongated shape and larger rear tyres create the identity of a drag car (*https://celebrationscakedecorating.com/galleries/top-fuel-nitro-funny-cars.html)*

It can be argued that a similar pattern emerges in other forms of motorsport such as *professional drag racing* and the *World Rally Championship (WRC).* These vehicles have been designed to be the pinnacle of speed albeit in different environments. Formula one cars have been designed to go fast around a closed circuit, drag cars have been designed for straight line speed and rally cars for manoeuvrability around gravel and "dirt" roads. Primarily, the ontology of these vehicles are to extract the most performance. Thus, the mechanical function of these vehicles become of utmost importance and their contextual settings and inner function mould the

aesthetic which therefore creates an identity, purely by using and expressing the mechanics of the race car.

"I think that cars today are almost the exact equivalent of the great Gothic cathedrals: I mean the supreme creation of an era, conceived with passion by unknown artists, and consumed in image if not in usage by a whole population which appropriates them as a purely magical object"

- *Roland Barthes*

Architects have for long used the race car and other industrialized objects to aestheticize architectural form and general architectural principles (Maulden, 1983). These can be seen in movements such as Googie Architecture and Futurism, where the Futurist manifesto explicitly states, among others things *"We declare that the splendor of the world has been enriched by a new beauty: the beauty of speed. A racing automobile with its bonnet adorned with great tubes like serpents with explosive breath ... a roaring motor car which seems to run on machine-gun fire, is more beautiful than the Victory of Samothrace"* (Marinetti, 1909).

Figure 19 Example of futurism architecture imitating a machine (*https://www.momondo.co.uk/discover/article/momondo-guide-architectural-styles)*

Figure 20 Example of "space age" googie architecture (*https://www.thoughtco.com/googie-architecture-space-age-marketing-178325)*

However, it can be argued that this created a form that detracted from the function of the space creating an inner function that is independent of the outer form. This essentially creates "scenographic" architecture and relates back to Robert Venturi's notion of the "decorated shed" *(Robert Venturi, cited from Maulden,1983)*. Evidently,

it can be stated that inspiration attained from the race car should not have been attained from an aesthetic premise but rather from the way in which it is used as a utilitarian object. Karl Botticher supports this notion by implying that architecture focuses on replicating and imitating historical models, whereas architecture should be about the operations of a building itself (Scwarzer, 1993). The focused manner in which race cars are designed and built shapes the identity through mechanical beauty and is defined by its contextual use. This links to Le Corbusiers theory of seeing architecture as a "thing" of use, rather than a superficial, representational or scenographic entity (Frampton, 1987:2). It can therefore be suggested that architecture should be true to itself and its mechanical construct in order to exploit its fundamental underpinning and utilitarian programme by using architectural tectonics.

"Where systems of space and structure are directly at the service of the program, and ornament is applied independent of them. This we call a decorated shed"
(Robert Venturi, cited from Maulden,1983)

4.2.2 Architectural tectonics

Karl Botticher, a German archaeologist who specialised in architecture, was among the first theorist to hypothesize the notion of architectural tectonics in the late 1800s. Through studies of Hellenic structures, he found that tectonics was not merely limited to issues of construction; rather it embodied an integrated study of function, structure and symbolism. (Scwarzer, 1993). This is evident in the orders found within Greek architecture. The load bearing or transferral of force junctions were emphasized in order to accentuate the joint and tectonic structure, which can be seen at the base and capital of these Greek structural systems.

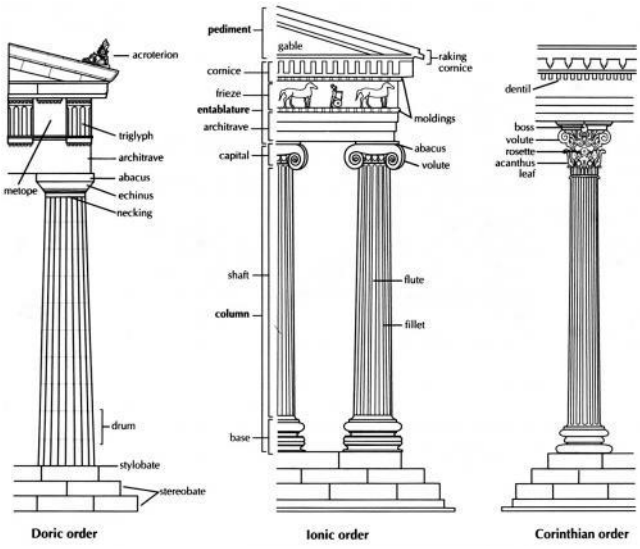

Figure 21 Image showing Hellenic structure (*https://www.enotes.com/homework-help/what-name-lintel-load-bearing-beam-that-forms-445814)*

Frampton (1995) relates tectonics to "the art of construction" and believed that ornamental architecture detracts from the essence of the function of a building. Botticher similarly described how the perception of art and nature in aesthetics, especially as a superseding entity separated the mechanical essence of the built form from its functional, structural and cultural forces. He saw art as a subjective matter and stated that for architecture to truly be art, it needed to be true to itself. Ezra Pound related this notion to that of poetry and music -*"Music begins to atrophy when it departs too far from the dance…poetry begins to atrophy when it gets too far from the music".* (Cited from Grabrow and Spreckelmeyer, 2015). Botticher therefore envisioned a hierarchy of aesthetic importance, placing the notion of art below that of tectonic form, with the essence of architecture's primary focus being the enclosure of space.

Gottfried Semper further broke down the essence of architecture by deconstructing the primitive Caribbean Hut. He identified four fundamental elements. The earthwork, the hearth, the framework/roof and the lightweight enclosing membrane, with the hearth (social space) at the centre of it (Semper (1851) cited in Frampton, 1987, 5). Frampton (1983) further states that although these four basic elements have been identified in an individual contextual typology, the underlying principle is evident in vernacular buildings throughout the world. The roles of the tectonic materiality however changes according to material availability and contextual and cultural climates. Botticher (cited in Shwarzer, 1993) stressed that utilizing the mechanical essence of architecture allowed for greater consideration of materiality and technological advances.

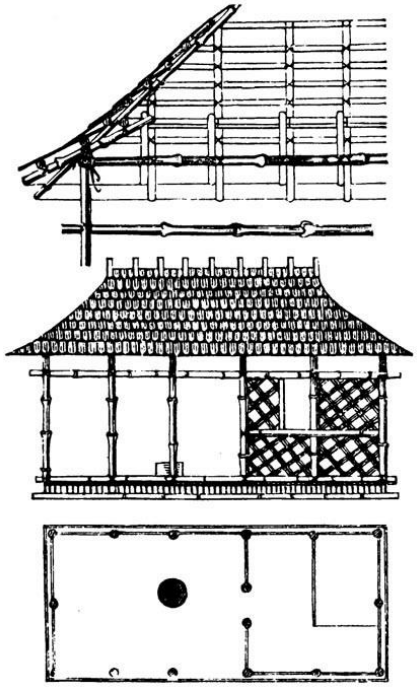

Figure 22 Image depicting earthwork, hearth, framework and roof (*Frampton (1983:13)*

Maulen (1983) later argues that architectural tectonics fundamentally allows architecture to be rooted in time and place, and gives architecture the ability to draw on an individual's perceptions of the built form by creating a sense of depth and allowing for varying personal interpretations. He further draws on the notion of epitomizing the building as a "thing" and developed this in two ways.

- The builings *"Inter-consciousness"* which characterizes it within its own surroundings (physical, social, political and economic).
- The building's *"inner-consciousness"* which is the building itself as a bearer of its own form and properties. It can be suggested that these two terms can be broken down into the buildings ability to perform within its contextual environment, and how the building performs on its own as a micro entity within a larger context.

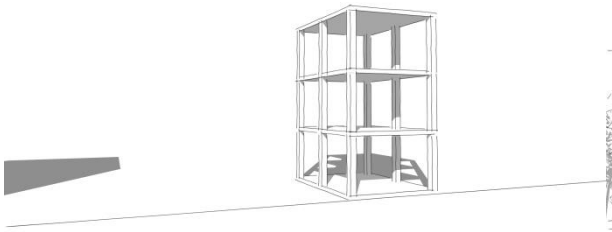

Figure 24 image showing buildings inner consciousness
(*By Author, 2018)*

Figure 23 Image showing buildings inter-consciousness
(*By Author, 2018)*

Grabrow and Spreckelmeyer (2015) suggest that limiting architecture to purely a utilitarian entity similar to the principles of the modernist movement creates architecture which is vulgar and spiritless. This however is not the aim of architectural tectonics. As suggested above, it rather aims to find beauty within its construction and emphasizes the structural joint as art. Furthermore, as will be discussed in the next section, it aims to create socially centred spaces through architectural technology. As with the race car, it can be argued that in order for a building to be the epitome of architecture, it should be true to itself in expressing the beauty of its construction through its utilitarian function.

4.3 Tectonic Space

Karl Botticher (cited in Shwarzer, 1993) envisioned a manifesto in which architects can create tectonic space. The fundamental basis of this is that architecture does not become architecture by merely adapting a preconceived model to a site. He states that human spatial requirements define the interior plan. It forms as the designer's response to social and cultural requirements, which suggests a people-centred design where the building is moulded on social activities. This links to Semper's four elements of architecture, in that the enclosure of a building is formed around the social space (hearth). Secondly, Botticher (cited in Shwarzer, 1993) speaks about the way in which the functional plan sets the framework for the constructive and material properties of the building. Essentially, he identifies the roof as the linkage between the plan and the structure, and this roof is determined by contextual contributing factors such as climate, material availability and social needs. This creates a roof line that mirrors the corresponding floor plan. The implementation of the roof structure in turn dictates the form and positioning of the static structural members which bear the roof load. Lastly he explains that the character of architectural space is formed through the interrelationships of the plan, roofing and supports. He identifies space as being formed by the enclosure of solids and voids. This directly relates to the ground surface, walls, columns, windows, ceilings and roofing. The culmination of these creates the qualities of interior spaces and a sense of "wholeness". It influences geometric dimensions and shapes, attributes of light and shadow, and articulation in materials and colours.

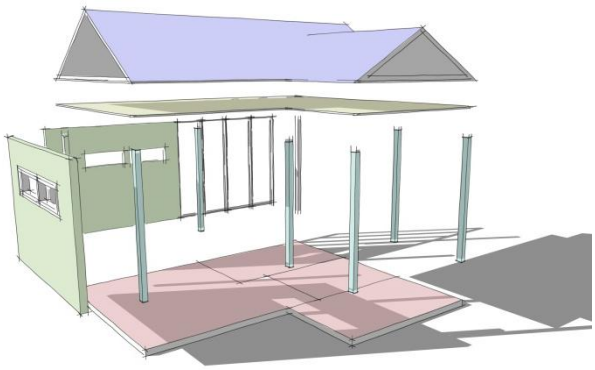

Figure 25 Image showing development of tectonic space (*By Author, 2018)*

The above suggests a reflection of Maulden's theory of a building's "inter-consciousness" and "inner-consciousness" whereby the core element of designing around social interaction that relates to the contextual requirements can be seen as

the inter-consciousness of the building. Where the building is treated as an entity in which enclosure of space is the primary function can be described as the building's inner-consciousness.

With the research provided above, it is evident that tectonic space is formed around social interaction, cultural adaption and contextual issues which link to the phenomena of "place" making.

4.4 Place making in tectonic space

From the previous chapters, it is evident that social space and social interaction plays a vital role in the culmination of culture and empowerment through architecture. One of the underlying principles of tectonics, as discussed above, is that architectural form should be moulded around social space. Day (2012) states that although we cannot make people meet and socialize, we can create spaces and places which are conducive to and promote social interaction. The following section aims to address this issue through the essence of "place" making.

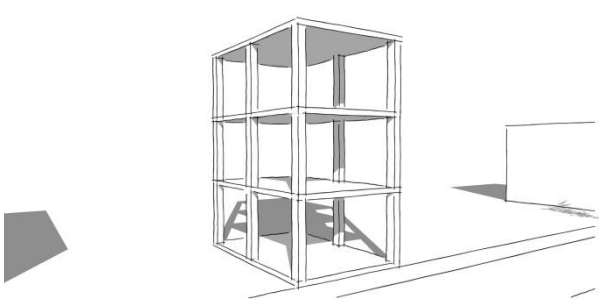

Figure 26 Image showing development of space (*By Author, 2018)*

Figure 27 Image showing development of place (*By Author, 2018)*

"Place", as defined by Norburg Shulz (1980), is not merely an abstract location. He discusses the combination of "concrete" phenomena such as people, animals, flowers, trees, forests, earth, wood, water and climate, together with the intangible manifestations such as feelings. It is the totality of these which make up the psychological and material substance of place. Moreover, he describes place as a qualitative "total" phenomenon which cannot be reduced to a single property. Thus, it can be argued that the spirit of place or the *genius loci* is centred on the "wholeness"

of a space. The direct forces acting upon it, such as culture, social interaction, context, static and dynamic parts, create the essence of place.

Norburg Shulz (1980) further defines three fundamental approaches in which genius loci (place) can be achieved. (1) Distinction between natural and man-made (landscape and built form). (2) Categories of earth and sky (horizontal and vertical) and inside-outside. (3) Character. However, the elements of place making can be analysed through two distinctions – space and character. With relation to the notion of space versus character, space denotes the three dimensional organization of elements within an enclosure or boundary; character, however, is achieved in the way in which these spaces are treated as defining elements and the general atmosphere it portrays. These abstractions are nevertheless interdependent, whereby one cannot exist without the other. It therefore is argued that two places may have similar functional attributes; however the quality of character could be vastly different.

Geometrically, space and place is formed through the implementation of boundaries. The Greeks referred to boundaries not as something which ends but rather as something that begins its presencing. Boundaries within the built form can be described as enclosures, which help people navigate through horizontal and vertical spaces. These enclosures come in the form of floors, walls and ceilings (Norburg Shulz, 1980) which links back to Karl Botticher's theory of tectonic space. The boundaries within the built form can theoretically be linked to the notion of inside-outside and horizontal and vertical. Norburg Shulz (1980) states that particular emphasis needs to be placed on the lateral boundaries i.e. walls, which is a determinant factor in the characterization of place. In the past the character of buildings would be defined by particular motifs such as a particular door or window which inevitably became conventional elements which ended in the transposition of character from place to place. Frampton (1983), however, spoke of fenestration as a point in which the forces of light and climate impinge on the outer membrane (wall/boundary) of the building. Thus, it has the ability to inscribe architecture with a unique character specific to a place. He further states that art museums of old used artificial lighting to portray exhibits. Conversely, he argues that natural light, although

not direct, should be allowed into these spaces. Norburg Shulz (1980) supports this notion by implying that the character of place should change through the day according to climatic conditions.

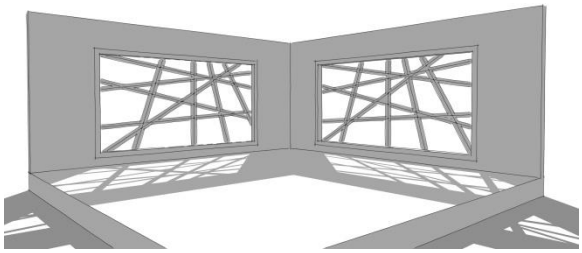

Figure 28 Image showing treatment of lateral boundaries in the creation of place
(By Author, 2018)

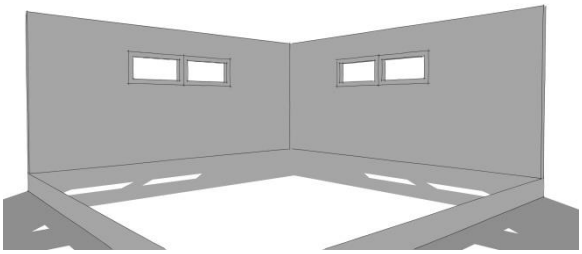

Figure 29 Image showing typical treatment of lateral boundaries
(*By Author, 2018)*

Norburg Shulz (1980) postulates that character is also determined via architectural tectonics through materiality and construction techniques. Therefore the built form must express the relationship between the forces acting upon it and building articulation. This relates to Karl Botticher's tectonic space and the linkage between plan and structure. Character, however, should not be primarily of a visual nature, but also tactile. Frampton (1983) suggests that the tactile experience creates place that can only be decoded through experiencing it

4.5 Conclusion

This chapter focused on the role of architecture in facilitating the socio-economic constructs within the scope of this study. It is evident that building articulation and the expression of the built form is of paramount importance in creating architecture that is true to itself and an expression of the mechanical beauty found within. The expression of the architectural tectonics of structure also creates conducive environments for social interaction by drawing on character through sensory and tactile implementations within the built form.

Chapter 5 Precedent Studies

5.1 Introduction

The following chapter looks at two key precedent studies within the context of this study. The aim is to reinforce the literature discussed in the previous chapters whilst providing possible architectural principles. Two different building typologies will be identified as per the theories suggested within the literature review in order to conceptualize how this information has been translated into architecture.

5.2 Translating automotive culture into architecture: Ferrari World

Project Name: Ferrari World
Location: Abu Dhabi, UAE
Architect: Benoy Architects
Year of Completion: 2010

Figure 30 Aerial image showing Ferrari World (*https://www.aluxurytravelblog.com/2018/01/08/6-unique-things-to-do-in-abu-dhabi/)*

5.2.1 Justification of precedent study

The challenge is to identify how car culture created around the automobile has been translated and facilitated through architecture. South African precedent of a facility which encompasses car culture does not exist; therefore principles of an international precedent will be explored. An example of this is Ferrari World, Abu Dhabi. The Ferrari brand has built its reputation through its racing heritage and historical significance within the automotive sector. Although not within a South African context, the building program and architectural response will be analysed at as it responds to the literature as detailed in the previous chapters.

5.2.2 Introduction and background

The intention of Ferrari World was to create the world's first Ferrari inspired theme park which draws upon the culture which the Ferrari brand has created. Ferrari World pays tribute to the brands principles which have been identified as passion, excellence, performance and technical innovation. Among these principles is the desirability of the brand with a target market aimed at the wealthy, which directly impacts the location and contextual setting for the project.

Abu Dhabi has become a symbol of opulence together with the areas newly developed Formula 1 context and Ferraris heritage in this regard. Abu Dhabi therefore creates the ideal setting for the expression of the cultural values of the brand. The building itself forms the centre piece of Abu Dhabi's automotive urban precinct.

5.2.3 Automotive urban context

Figure 31 Aerial map showing contextual setting *(www.google.com)*

Ferrari World is located in Yas Island, Abu Dhabi a 25km^2 entertainment and recreation destination. As early as 2006, Yas Island was an empty landscape of dessert surrounded by navigable water. The island's master plan as designed by Benoy Architects places water and theme parks to the west, stadiums and performance arenas to the east, residential parks and community spaces to the north and automotive facilities to the south. Currently the immediate urban context of the site includes automotive facilities which include the Yas Marina F1 circuit, Yas

Kartzone, Yas Drift Park and Yas Drag Racing Circuit. The south side of the buildings context includes the motorsport facilities as mentioned above. The north side opens into the Yas Marina shopping mall and directly linked to it through the Ferrari gateway bridge. This automotive driven context within a prime setting suggests the vast scale of the automotive industry as a subculture of leisure and enthusiasm.

5.2.4 Building Programme

Ferrari World houses 20 Ferrari themed attractions which include indoor and outdoor activities. Among these, mirroring the brand's affiliation with speed and performance is the world's fastest roller coaster (Formula Rossa).

The culture of the Ferrari brand was brought into architectural spaces through the use of various exhibits and attractions. These attractions are intended to fundamentally portray the essence of the brand. Some of these attractions include:

- **Viaggo in Italy**: An experiential journey which mimics the homeland of Ferrari, Italy. The user is able to experience the culture, sights, sounds and aromas which are found within the country

Figure 32 Galleria Ferrari *(https://homesthetics.net/ferrari-world-abu-dhabi-benoy-architects/)*

- **Driving with the champions:** is a racing simulator which takes the user around the Fiorano replica Test track, which Ferrari uses to test new vehicles.
- **Tyre change experience:** with Ferrari's strong Formula 1 Heritage, visitors are able to experience what it would be like to be part of the pit crew in a Formula 1 race. With this, they are able to experience what it would be like to change a tyre on an authentic race car against the clock.

- **Made in Marinello:** Marinello is the home town of the Ferrari factory and holds large historical significance. Visitors are able to go on a virtual tour of the historic Ferrari factory.
- **Galleria Ferrari:** This is the gallery/exhibition space which allows users to experience the car designs and appreciate the history of various models which the brand has created over the years.

- **Roller Coasters:** The inclusion of high speed roller coasters allows the user to experience what it would be like to be a race car driver by simulating G-Forces and high speed bends.

Through the above mentioned attractions, it is evident that all facets of Ferrari's cultural significance has been portrayed through these spaces. It allows users to experience the brand.

Figure 33 Spatial plan of Ferrari World *(https://www.ferrariworldabudhabi.com/)*

5.2.5 Architectural response

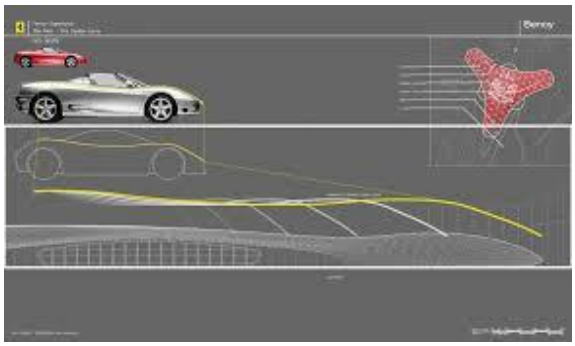

Figure 34 Image showing the double curve inspiration of a Ferrari car *(http://www.bonah.org)*

Functionally, the building needed to house a large number of attractions in a controlled manner, whilst engaging with the adjacent shopping centre and race track. Benoy's proposal was to externalise the edges of the building in order to allow engagement with the outdoors. The prominent feature of the building is the ground hugging roof structure. The form has been directly influenced by the double curve evident in most Ferrari road cars. This double curve inspired the proportion of the form and created a building 700m from end to end with a height of 45m. Large alcoves were cut into the roof structure in order to facilitate and permit indoor/outdoor interaction and to house the large roller coasters and flexible performance spaces. These tri-form cavities are located on the east, west and south sides, with the east and west opening onto roller coasters, whilst the south side opens up onto a public performance space which links to the adjacent Yas Marina Circuit.

Ferrari World has a total area of 172 000m^2 and an enclosed footprint of 100 000m^2, making it the largest indoor theme park in the world. The visually distinctive form and shape greets all visitors entering Abu Dhabi via the international airport located within close proximity of the area. This, as argued by the architect, is an expression of Ferrari's values of passion and excellence. Upon entering, the scale of the building deceives. With its automotive inspired proportions, the high volumes are interpreted by a single silver lining which cantilevers over the building edge.

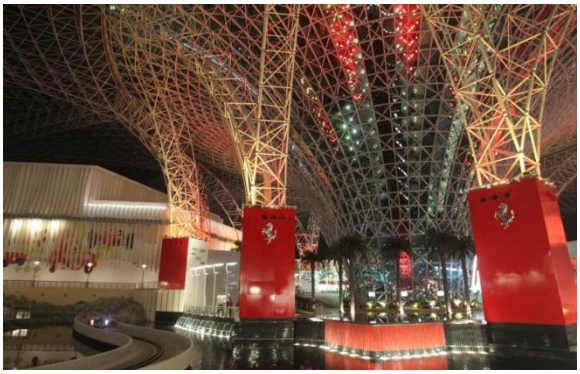

Figure 36 Internal tectonic form (*https://homesthetics.net/ferrari-world-abu-dhabi-benoy-architects/)*

Figure 35 Roadside elevation of façade (*https://homesthetics.net/ferrari-world-abu-dhabi-benoy-architects/)*

Internally however, the building takes on a different form. The double curve external aesthetic has been converted into a tectonic expression of architectural constructional joints and load bearing components with a large space frame which surges through the interior space. At the centre of the plan is a dipping, funnel-like tower which meets the roof and gives the impression of the structure growing from the ground up. This open space creates a well of light for the internal spaces. This is a direct contrast to the prominent external roof structure and aesthetic which defines Ferrari World with its sleek curves. The internal tectonic expression does not detract from the fundamental essence of Ferrari world which are the exhibits and attractions. It is clear that the culture of Ferrari has been expressed through architectural spaces and building form.

5.3 Empowering spaces through social interaction: Kawartha Trades Centre

Project Name: Sir Sanford Fleming College, Kawartha Trades and Technology Centre
Location: Peterborough, ON, Canada
Architect: Perkins + Will Toronto Office
Year of Completion: 2014

Figure 37 Perspective of Kawarhta Trade Centre *(https://www.archdaily.com/800181/sir-sandford-fleming-college-kawartha-trades-and-technology-centre-perkins-plus-will)*

5.3.1 Introduction and background

Established in 2014, the Kawartha Trades and Technology Centre forms a central part of the Sir Sanford Fleming College in Peterborough, Canada (www.archdaily.com). The college enrols approximately 4380 full time students annually in business, health and skilled based courses. The inclusion of the Kawartha trade centre manifested as the university found an opportunity to invest in the local community through innovative skills development programmes. The centre is an 8000m^2 training facility aimed at disciplines such as carpentry, electrical, heating, refrigeration, welding and plumbing (www.mykawartha.com). The vision for this building was to combine the theoretical approach to learning with applied learning whilst creating a dynamic environment where "learning can happen anywhere" (www.flemingcollege.ca)

Figure 38 Aerial Image showing context of Kawartha Trade Centre *(https://www.archdaily.com/800181/sir-sandford-fleming-college-kawartha-trades-and-technology-centre-perkins-plus-will)*

5.3.2 Urban Setting

The Kawartha Trades and Technology Centre is located within the Sir Sanford Fleming College in Peterborough, Canada. The building is a standalone building and is flanked by the adjacent college and green space reserve.

Access to the building was designed to invite pedestrian movement from the student residence and sports wellness centre which are located to the north. According to research done by the architect Perkins + Wills, it has been found that skilled trades are generally taught within repurposed industrial buildings which fragment the field from other curriculums. Thus, it portrays the skills trade as inferior and less attractive to prospective students. With Kawartha trade centre, the architect radically proposed that the building be placed at the heart of the campus with a strong link to existing social hub and academic spaces to infuse and promote social learning.

Figure 39 Context showing map *(www.google.com)*

Figure 40 Interior social space *(https://www.archdaily.com/800181/sir-sandford-fleming-college-kawartha-trades-and-technology-centre-perkins-plus-will)*

The building was established to form a central part within the Sir Arthur Fleming College. The idea behind it was to use innovative design techniques in order to sustain and promote interest in the skills trades and training programs which have been identified as scarce. In order to create this, the building integrates theoretical learning with practical practice whilst creating authentic learning environments. The fundamental design aspiration was to explore new avenues in which learning can happen, with the hypothesis that learning can happen anywhere (www.archdaily.com). The building therefore needed to provide an environment that

emphasizes program and spatial transparency between trades. The building program includes SMART classrooms, faculty offices, teaching workshops, bulk project storage and administrative spaces. (www.flemingcollege.ca)

5.3.4 Architectural response

The building has been located in order to work with the topographical context. It partially buries the lower floor on the east side whereas on the opposite side it meets the existing site levels, thus creating an unobstructed entrance into the main learning space. In order to create collaborative and innovative spaces, the building was designed to be as open as possible. The focal learning area was designed as a large, quadruple volume, open space called the learning factory. This space was designed to accommodate all facets and trades offered within the learning curriculum in order to integrate disciplines.

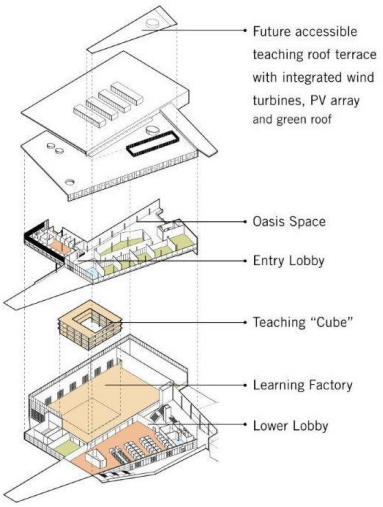

Figure 41 Development of planning *(https://www.archdaily.com/800181/sir-sandford-fleming-college-kawartha-trades-and-technology-centre-perkins-plus-will)*

"We wanted the facility to emulate a real-world construction site, where so many different skills come into play" Duff Balmer, Perkins + Wills Architects (www.onofficemagazine.com)

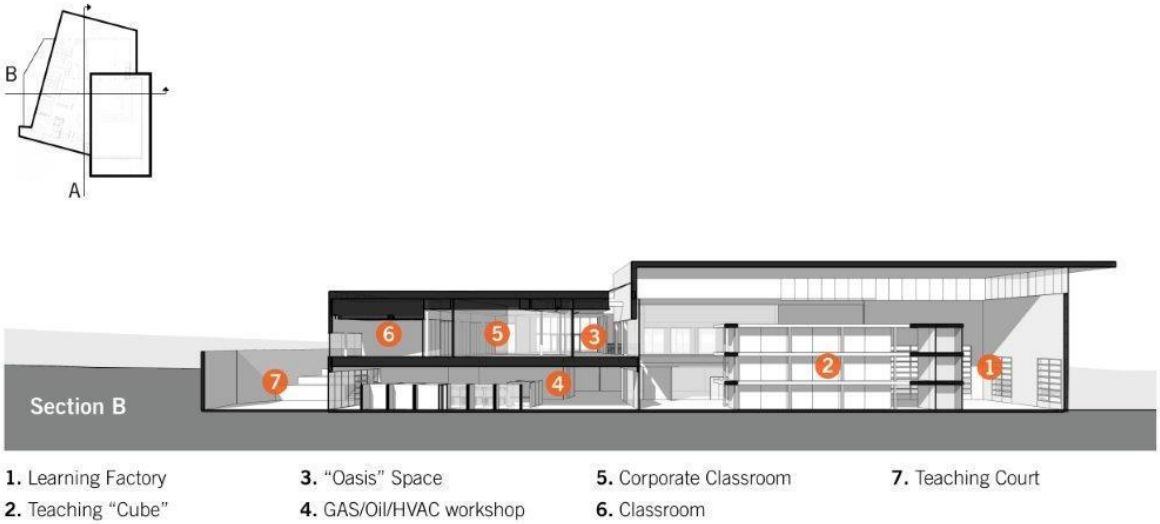

Figure 42 Section through building *(https://www.archdaily.com/800181/sir-sandford-fleming-college-kawartha-trades-and-technology-centre-perkins-plus-will)*

At the centre of this is a four storey "learning cube" which provides a flexible space for electrical and plumbing installations which serve as a more authentic environment and simulates real world conditions. This learning environment creates a space that promotes the pollination of ideas across students of different levels and trades and this enhances the learning experience and social interaction. Within the building are a series of naturally lit flexible spaces which promote social gathering and informal learning. Natural light forms an essential part of the architects design in order to maximise health and learning.

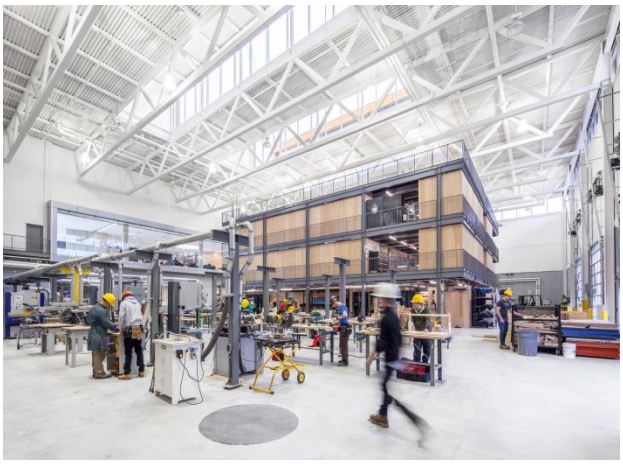

Figure 44 Workshop/learning space *(https://www.archdaily.com/800181/sir-sandford-fleming-college-kawartha-trades-and-technology-centre-perkins-plus-will)*

Figure 43 Entrance/social space *(https://www.archdaily.com/800181/sir-sandford-fleming-college-kawartha-trades-and-technology-centre-perkins-plus-will)*

"By making the space open, collaborative, transparent, inviting, dynamic, and by integrating the building into the main campus, you are helped to break down barriers to access,"

Duff Balmer, Perkins + Wills Architects (www.onofficemagazine.com)

Figure 45 Lower Level and Ground level floor plans *(https://www.archdaily.com/800181/sir-sandford-fleming-college-kawartha-trades-and-technology-centre-perkins-plus-will)*

The aim of the architectural form was to incorporate the various trades taught within the centre. This was done through the expression of architectural building techniques and structural joints. Hence, through this expression of tectonic form, the materials used were raw and uncovered. The materials primarily used were steel, structural concrete, cedar and corten steel. Along with the expression of these materials, the colour pallet also created neutral tones which blend into the contextual setting.

Chapter 6 Case Studies

6.1 Introduction

The following section looks at two primary case studies within the context of this study. These case studies will be analysed through the framework suggested in the previous chapters. The combined building typology of culture and skills development which this research document aims to address does not exist therefore the theoretical framework has been broken down into three parts; Culture, empowerment and tectonics.

Culture

Dezzi raceway, a racing facility located in Port Shepstone, KZN will be used as a case study to analyse the way in which architectural spaces integrate car culture. Secondary case studies will analyse the third spaces used by automotive enthusiasts to promote and facilitate their needs.

Empowerment

Shukela Training Centre based in Mount Edgecombe, Durban is a skills development centre which aims at empowering individuals through developing skills and trades. The institution's motor mechanics sector will be analysed, together with spatial requirements and the social dynamics which can promote learning.

Tectonics

As mentioned in the previous chapters, architectural tectonics will be used to integrate culture and empowerment through architectural forms and spaces. Thus, the way in which the aforementioned use architectural tectonics through spatial dynamics will be analysed and interpreted.

6.2 Shukela Training Centre

6.2.1 Background and introduction

Established in 1974, Shukela Training Centre is a wholly owned subsidiary of the South African Sugar Association (SASSA). It is located in Mount Edgecombe, Durban and provides accredited training in agriculture, fitting, turning, fitting and turning, millwright, automotive mechanics, diesel mechanics, electrical refrigeration, air-conditioning, instrumentation, welding and boiler making. For the purpose of this study, focus will be primarily within the automotive training sector. The centre has accreditation with the National Artisan Moderating Body (NAMB) as a skills development provider and trade test centre. The centre offers training in the abovementioned fields to private and institutional clients, such as local municipalities and various trade related businesses.

Figure 46 Aerial image showing Shukela Training Centre
(www.google.com)

6.2.2 Justification of case study

A large component of this study focuses on skills development within the automotive industry. The spaces used within this type of trade skills development are not generic and require spaces which are conducive to the context of what is being taught. This case study will therefore offer insight into the spatial requirements and overall learning program in order to design a holistic intervention. The said building will be analysed through the theory of empowerment and tectonics.

6.2.3 Urban setting and contextual analysis

The training facility is located in Mount Edgecombe, which is North of Durban and is known for its sugarcane plantations, prior to being developed. This suggests the location of this training facility is being used as part of SASA's vision to integrate training within the sugar industry. The site is approximately 33000sqm and is located at the edge of the high end, residential Mount Edgecombe Estates and is adjacent to the arterial R102 freeway. Access to the site is however via the secondary road, Golf Course Drive. The immediate context of the facility includes residential, educational, commercial and religious buildings which creates a dynamic area with many uses.

Figure 47 Map showing context *(www.google.com)*

6.2.4 Automotive course outline and spatial requirements

The automotive course outline plays a vital role in the spatial requirements for a facility of this nature. The course is divided into three phases which run over three years. Phase 1 runs for a total of 13 weeks and phase two and three a total of 10 weeks each with each class having an average of 12 students. Between phases students are required to gain practical experience by working within the field. Upon completion of the three phases, students are then eligible to do a trade test which will consequently complete their qualification in motor mechanics. The centre primarily facilitates students who are already employed, whilst the privately funded students have to find employment on their own capacity. The general spatial learning requirements, which will be further defined in the next section, include a workshop and theoretical learning spaces.

6.2.5 Architectural response

Accommodation requirements

A training facility of this nature requires a number of various spaces. The spaces mentioned below are primarily general spaces which link to the automotive training sector,

- Workshop and training area
- Facilitator offices
- Administration offices
- Outdoor store area
- Tools store
- Parts store
- Lecture room
- 76 seat auditorium
- Training/conference room
- Cafeteria
- Ablutions
- Outdoor amphitheatre
- Tuck shop
- Trade test room
- Reception
- Staff and visitor parking

Macro spatial organisation

The placement of the buildings within the site seems to revolve around the main training space, which is the workshop. Access to the site can be found through two entrances which are defined as visitors and staff/students. Pedestrian access is via a security gate located adjacent to the staff entrance. Entrance into the building space is controlled and is separated for student and facilitators as from the reception area students are unable to access the workshop directly. The spaces around the facility are informal in nature with an abundance of trees and green spaces which cater for

the congregation of students and social interaction. These informal spaces however create, left over spaces within the facility which have been adapted for storage, outdoor learning, practical training and social interaction. The north side of the site is designated primarily for teaching and learning, the south has been allocated for student accommodation which houses students from around the province. The workshop and learning spaces on the north side are clustered together which creates an intimate space for social interaction and learning. The residences however seem fragmented and create large open spaces used for recreation.

Micro design

Figure 49 Image showing green spaces
(By author, 2018)

Figure 48 Map showing development of spaces
(www.google.com)

Figure 50 Informal social spaces
(By author, 2018)

Figure 51 Vehicular circulation
(By author, 2018)

Educational and learning spaces

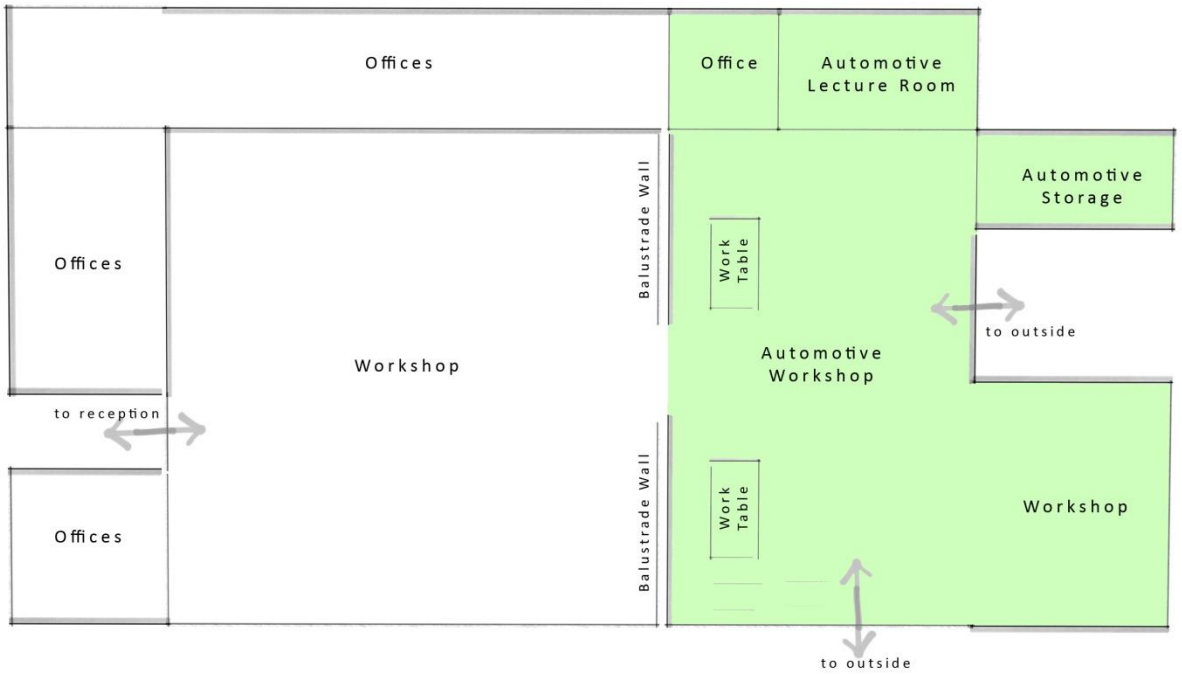

Figure 52 Plan showing workshop area
(By author, 2018)

The main workshop and training space houses all sectors of STC's curriculum. This creates a space that is holistic and allows for exchange of expertise between students. Due to the heavy machinery and safety requirements; the various training spaces are separated through the use of floor demarcation tape, safety balustrades and low level brick walls. These demarcation tactics distinguish the various areas i.e. training and circulation space around the workshops. The automotive training centre is located on the East side of the workshop. The classroom space provided is relatively small; the layout of it however is not of a typical classroom. The elongated desks are set in a "U" shape which suggests that engagement between students is promoted. It is evident that much of the practical learning happens in the main workshop space, generally in informal gatherings of students and facilitators, around a whiteboard or mechanical components. The furniture provided within the workshop space is of ergonomic considerations for a person standing rather than sitting, due to the nature of the tasks at hand. This also leads to the workshop having minimal

seating for students and facilitators, which suggests that little is being done for users to take a break within these spaces.

Figure 54 Demarcation tape distinguishing spaces
(By author, 2018)

Figure 53 Balustrade walls used as furniture
(By author, 2018)

Social and recreational spaces

As mentioned previously, the positioning of the buildings around the site have created courtyard and pocket spaces which enhance spontaneous social interaction between students. The formal, social spaces provided are primarily the amphitheatre and cafeteria space. The amphitheatre is located adjacent to the workshop and can be accessed directly from it. This green space creates an oasis for students during break times and is flanked by the tuck shop which is open throughout the day. This space is secluded from the central node of the campus and provides refuge space for students to get away from the busy workshop and learning spaces. The buildings around the amphitheatre enclose it which creates an intimate area for social interaction.

The cafeteria is a formal dining area used primarily for students who live on campus. The dining area contains a kitchen and indoor eating area which includes a number of tables and chairs. This space opens onto a covered verandah and outdoor garden which has outdoor furniture and provides rest areas. The cafeteria is located further away than the aforementioned amphitheatre even though both spaces are primarily used during lunch and tea times by students. During the general learning day it is only used for meal preparations or by visitors using the conference room.

There are multiple informal social spaces strewn across the campus in the form of benches and seating which are generally located underneath trees or adjacent to the building structures. This suggests that social interaction happens in shaded and cooler areas. It has also been observed that students use the classrooms as refuge spaces during lunch times for social interaction.

Figure 55 Social Space: cafeteria *(By author, 2018)*

Figure 56 Social Space: amphitheatre *(By author, 2018)*

Structural form and building character

It is evident that building form and character plays a vital role in the way in which students use and learn within these spaces. The architectural form of the building seems to be moulded for its specific function; therefore it cannot be linked to one specific overriding building style.

Figure 57 Image showing building form from road *(By author, 2018)*

Figure 58 Image showing industrialized character of workshop *(By author, 2018)*

As a visitor into the campus, one has to enter through the visitors entrance which forms part of the administration block. The aesthetic appeal of this block directly enforces the function of the interior spaces, which is administration activity. It is a standard brick form which has been plastered and painted white. Upon entering the workshop space, however, the character of the space changes drastically. The industrialized workshop aesthetic is pronounced through the expression of the structural steel members, roof sheeting and high level glazing.

The workshop space, which is the focus of this analysis is a double volume open space enclosed through the use of a portal frame structure. The primary structure is structural steel and is enclosed using brick infill walls which have been plastered and painted. The roof is a series of steel gable structures at fluctuating levels with clearstory glazing. The glazing is orientated North and South, which allows ample indirect light for the learning spaces. The structural steel columns have been adapted for multi-purpose use through the hanging of various tools around the workshop. The floor finish, as opposed to other spaces around the campus is purely functional and is a pastel green, industrial grade floor finish together with demarcation tape which differentiates spaces.

6.3 Dezzi Raceway

6.3.1 Background and introduction

Figure 59 Aerial image showing Dezzi Raceway *(https://twitter.com/_arrivealive/status/539685158421823489)*

In their paper entitled "street racing: a neglected research area?" - Vengilis and Smart (2009) draw on all aspects of car culture and suggests that it has been a neglected study area within the academic field. Therefore empirical research through case studies and observations for this study becomes of paramount importance in order to engage the way that people use this commodity for social purposes.

Dezzi raceway is a privately owned race track located in Port Shepstone, Kwazulu-Natal. It boasts, among others, a 2.5km race track which is the only MSA (Motorsport South Africa) approved track in KZN. Other facilities include an 800m drag strip, spinning and drifting track, bed and breakfast and 2 privately owned residences. The privately owned land was originally an airstrip which was later adapted for use as a drag strip and thereafter a fully-fledged race track. Some of the events hosted by Dezzi Raceway include; drag racing events, drifting, spinning, motor shows, historical racing and track days.

6.3.2 Justification of case study

Figure 60 Image showing aerial mapping of Dezzi Raceway (www.google.co.za)

Due to the negation of car culture within academic research (Vignillis & Smart), empirical data will form insight into the various aspects which ultimately form this culture. Dezzi raceway is the only dedicated motorsport facility in KZN and hosts various motoring events which are directly linked to the local culture created around the automobile. This case study will therefore offer insight into the way people use the spaces provided by this facility which will form the basis of the architectural intervention.

6.3.3 Urban setting and contextual analysis

Dezzi raceway is located in Port Shepstone, Kwazulu-Natal and is approximately 130kms from Durban. It is adjacent to the R61 freeway, however cannot be accessed directly from it. The secluded site is flanked by a handful of residential homes and a single church. There is a vast green belt which can be found on the North and East side of the facility. Access to the site is through a single roadway which is dedicated to the facility. However, it is evident that pedestrian access poses a problem due to the seclusion and remoteness to nearby bus and taxi routes.

6.3.4 Automotive activities

The facility hosts a number of various automotive events. Among these are:

- **Circuit Racing:** this is an event whereby a number of vehicles race around a track (circuit) for a number of laps. The winner is decided as the first driver to

complete the designated number of laps. Dezzi Raceway includes a 2.5km racetrack.

Figure 61 Image showing typical circuit race *(https://pagebd.com/video/search/What-I-did-on-my-holidays-Dezzi-Raceway.html)*

Figure 62 Image showing typical drag race *(By author, 2018)*

- **Drag Racing:** this is an event whereby 2 cars race simultaneously along a straight line over 400m. The drivers then use the remainder of the track for braking and slowing down. Once the race has been safely completed, another race begins. Upon completion the drivers return to the pit lanes or waiting area until scheduled to race again. Dezzi Raceway has a 800m drag strip (400m race distance + 400m braking) which forms part of the full circuit as mentioned above. Upon completion of the race, the drivers wait at the end of the track until all races are paused so they can return safely to the waiting area.

- **Drifting:** drifting is a sport where 2 or more cars drive in tandem, whilst performing skilled manoeuvres which include deliberately losing traction, around a designated circuit. The lead car goes first while the following car imitates and attempts to get as close as possible (without touching) to the leading car. Once a lap has been completed, the cars will change position, whereby the car that was initially leading will then follow to repeat the cycle. This event is not a race and is not decided on who finishes first; the winner is decided through a panel of judges according to a set criteria. For example: drift angle and proximity to lead car. A part of the full circuit at Dezzi Raceway is used in order to hold drifting events.

- **Spinning:** this is a sport which originated in South Africa and is fast growing. The sport entails a single driver performing skilled manoeuvres within a designated space for a period of time. The space provided at Dezzi Raceway for this activity is a designated circular track space which doubles as a skid pan used for advanced driving lessons.

Figure 63 Image showing typical spinning exhibition *(http://lwmag.co.za/2018-supadrift-series-round-5-drift-report)*

Figure 64 Image showing two cars drifting *(http://www.bmwcase.com/tag/bmw-325is-gusheshe-in-sa/)*

- **Motor shows (concours):** motor shows are an exhibition of vehicles and vehicle modifications. During these shows individuals exhibit their modified vehicles as pieces of art around the facility. This type of show is usually held as an all-day event and creates the opportunity for vehicle manufacturers, workshops and general automotive based businesses to exhibit and expand their business to likeminded individuals. Other events which take place at these shows include Dyno Testing (testing of car power), Sound competitions (competition for the loudest stereo), drifting and radio controlled car drifting.

Figure 65 Image showing typical motorshow *(By author, 2018)*

Figure 66 Image showing sound competition *(By author, 2018)*

6.3.4 Architectural Response

Spatial layout

The built form around this facility includes a number of building typologies. The placement of these buildings are informal in nature and scattered around the facility. Majority of the built form which relates to this study can be found in the middle of the facility. These include.

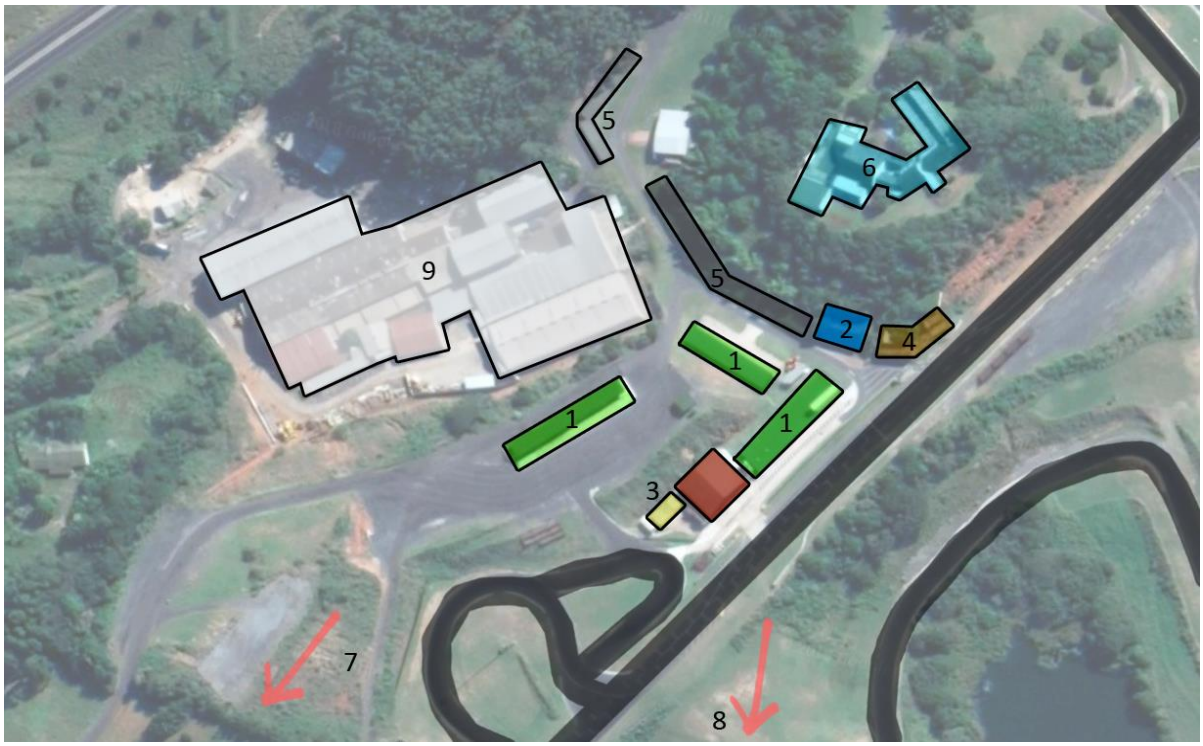

Figure 67 Aerial mapping showing layout of Dezzi Raceway (*www.google.com, adapted by author, 2018)*

- **(1) Pit garages:** A total of 4 pit garages are catered for, these include 3 open garages and one closed. They are located to the west of the track and are used for multiple activities, as will be discussed later on in this chapter
- **(2) Media centre:** the media centre is a standalone building, this is a multi-function space used for post-race award ceremonies and organizers meeting space
- **(3) Workshops:** there are 3 workshops within the main facility. These workshops are used by privately run businesses whose core function is for building race cars.

- **(4) Cafeteria and restaurant:** the cafeteria and restaurant can be found adjacent to the media centre and overlooks the racetrack
- **Grandstands:** there are a number of grandstands located around the facility. The placement of these in relation to the drag strip are at the start line, the middle and the finish line. There are also a number of raised timber viewing decks used for general viewing.
- **(5) Parking:** undercover parking is provided for race days and general use
- **Airplane Hangar:** the airplane hangar forms part of the facility's initial program of being an airplane runway.
- **(6) Residential 1:** the largest residential home within this facility is located on the highest point of the site and is secluded from the rest of the facility's built form. This residence is owned and used by the owner of the facility and is inaccessible to users of the facility
- **(7) Residential 2:** is located to the west of the track and is also set a distance away from the facility's built form. It is used by staff members of Dezzi Raceway and also includes a workshop which is used by a privately owned company specializing in race cars
- **(8) Bed and breakfast:** the bed and breakfast is located on the east of the track and is used as overnight accommodation for users of the facility
- **(9) Desmonds equipment:** this is a factory owned by the proprietor of the facility and is the business premises of Desmonds Equipment. The area is out of bounds for users of the racetrack and does not impact on the usage of the facility.

Connectivity and circulation

The racetrack has been designed for motorcar usage and one gets the sense that pedestrian movement was not the focus of the design. Differentiation between motor car and pedestrian movement is not well defined. There are no dedicated pedestrian crossings over the race track, movement from west to east of the race track is usually done during a pause in racing and at the discretion of the safety marshals. There are no dedicated walkways in which users are guided around the facility.

Ultimately it can be assumed that orientation and way finding around the facility has not been adequately catered for.

Figure 68 Image showing pedestrian crossing over track *(By author, 2018)*

Figure 69 Image showing undefined pedestrian and automotive circulation *(By author, 2018)*

Architectural form and character

The buildings as mentioned above have been designed for different typologies and incorporate various architectural styles. Below is an illustration and description of the built form on which this study is based.

Pit garages: these pit garages are made up of a structural steel portal frame and are open at the entrance of it. These structures are approximately 3m in height and are completely empty which suggests that they are multi-functional spaces. They are clad with green IBR sheeting which have been bull-nosed at the corners which creates a chamfered edge. A portion of this has been closed using brickwork, painted white.. Once inside this space, the structural form is clearly visible and is not adorned with cladding which detracts from the essence of the built form. The representation of exposed steel form reinforces the prominence of the automobile within this space.

Media Centre: it is evident that this building has been designed in proportion to the human being. It has not been designed for the motor car therefore the form which resembles "domestic" architecture drastically differs from the pit garages. It is a facebrick building which uses an IBR sheeted gable roof which matches the pit

garages. The multi-function space is completely open and access to it is through 2 adjacent sliding doors.

Figure 71 Image showing architectural form of pit garage *(By author, 2018)*

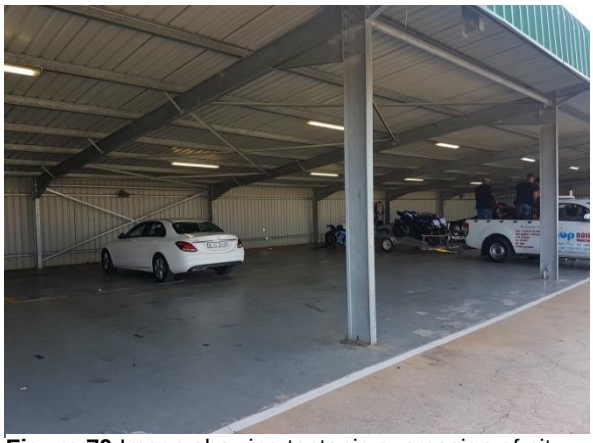

Figure 70 Image showing tectonic expression of pit garage *(By author, 2018)*

Figure 72 Cafeteria and restaurant *(By author, 2018)*

Figure 73 Media centre *(By author, 2018)*

Cafeteria and restaurant: adjacent to the media centre, the cafeteria and restaurant is a predominantly timber structure. The restaurant opens onto a timber deck which overlooks the drag strip. It is a double story structure with an additional viewing deck above the restaurant. The timber structure is clad with advertising decals and sign boards due to its prominent position within the facility. These advertising boards however detract from the architectural construction and beauty of the structure. The roof is made up of IBR sheeting on timber trusses. The materiality of the structure changes the character of the space as it differs from the other built form around the facility. It can be seen as an oasis space designed purely for the visitors and spectators, unlike the rest of the built form within this facility.

Parking: The undercover parking bays are made up of a timber structure. Gum poles spaced at approximately 3m apart carry the weight of the timber roof structure and IBR roof sheeting. The floor material differs from the predominantly tarred facility with the use of concrete flooring which is lined by red brick paving. The use of paving suggests areas for pedestrian movement; however the positioning of the paving directly behind the parking bays creates an unsafe environment for pedestrians.

Figure 74 Image showing covered parking *(By author, 2018)*

Figure 75 Image showing privately owned workshops *(By author, 2018)*

Workshops: it can be suggested that the positioning of the privately run workshops is not ideal. They are positioned adjacent to the much larger airplane hangar and recessed which creates poor visibility for passers-by. The building itself resembles a domestic garage, it is a brick built structure which has been plastered and painted green to match the built form around it. The roof is a monopitch, IBR sheeted roof.

6.3.5 Adaptability and event spatial dynamics

As stated previously, Dezzi Raceway has been used for a number of various events. This section will look at 2 different events in order to understand how the spaces have been used and adapted in order to facilitate the various activities.

KZN Drags

Figure 76 Aerial image showing waiting area for race cars
(*Vinni Singh Photography)*

This is an event which hosts drag racing at the facility and takes place a number of times throughout the year. The particular event in which this case study was done was a non-profit event, whereby all proceeds went to a charitable cause. Due to the nature of this event, only the drag strip and supporting spaces were used. Entrance to the event, as shown in the diagram was through the back of the facility and parking was found around the pit garages and grassed areas which are unmarked. As a spectator, you would have to cross over the active track in order to access the general social spaces, grandstands and pit/waiting areas. As mentioned previously, pedestrian movement is not favoured and access to the opposite side was done by crossing over the track at a safe time as directed by safety marshals. This scenario is not ideal as it creates a waiting period for the spectators. The grandstands and social interaction occurred at the start line, middle and end of the track with majority of the spectators standing informally against the safety barriers, rather than using the

provided grandstands furthermore the general open spaces were used by spectators who chose to erect portable structures whilst congregating around their motor vehicles to engage in social interaction and viewing of the even; this suggests that people prefer to gather informally at an event of this nature. Closer to the pit/waiting areas is where people movement is at its highest. People generally congregate around race cars, viewing and speaking to the race drivers whilst experiencing the essence of the place. Various activities occurred within the space such as music, automotive mechanical work, tuning and social interaction.

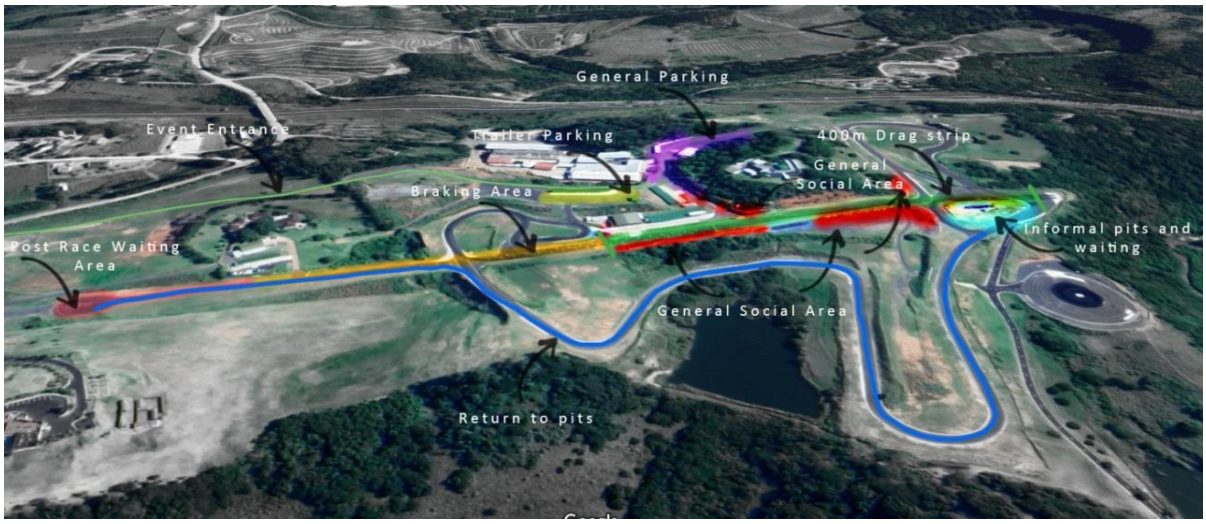

Figure 77 Mapping showing event facility usage (*www.google.com, adapted by author, 2018)*

Figure 78 Image showing informal mechanical work done *(By author, 2018)*

Figure 79 Image showing spectators congregated around race cars *(By author, 2018)*

It is worth remembering that the drag strip forms only part of the overall circuit, therefore most part of the circuit is used for returning race cars to the start line and also doubles as the pit/waiting area. This scenario also creates an issue as race cars which have completed the race would have to power down their vehicles and wait at the end of drag strip for a pause in racing so they could return to the start line as

Figure 83 Image showing underutilized pit garages *(By author, 2018)*

Figure 82 Image showing general parking *(By author, 2018)*

Figure 81 Image showing pedestrian crossing point and drag strip *(By author, 2018)*

Figure 80 Image showing pit garages used as trailer parking *(By author, 2018)*

there is no dedicated return road.

There is no designated space for safety vehicles such as medical and fire. Therefore, these emergency vehicles wait adjacent to the race track on a part of the full circuit. The facilities main pit garages however were underutilized due to the distance from the drag racing start line. They were used on occasion by race car drivers who were having major mechanical issues with their vehicles. The pit garage located on the far side of the facility was mainly used as parking for trailers and

transportation vehicles in which the race cars arrived. This suggests that the pit garages provided were predominantly designed for formal circuit racing.

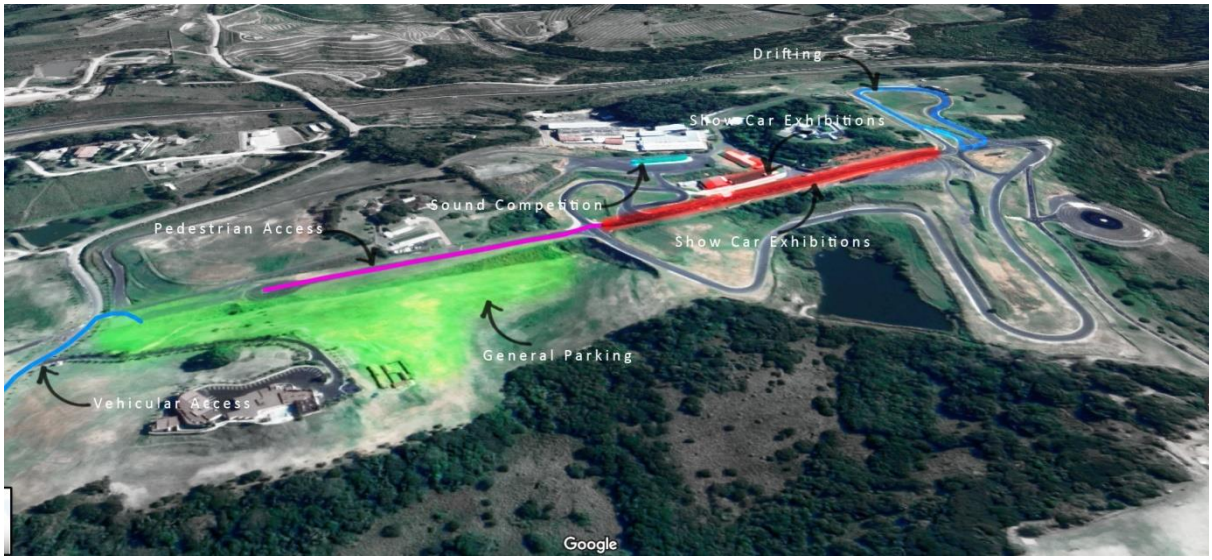

Figure 84 Mapping showing usage of facility (*www.google.com, adapted by author, 2018)*

Autostyle Motor Show

The Autostyle motor show is an annual motor show which is held in various locations around the province with one of the previous locations being the Pavilion Shopping Centre parkade in Westville, KZN. The show held at Dezzi Raceway included a host of automotive activities such as: car shows, sound competitions, dyno testing, drifting, stalls and markets.

Figure 85 Aerial image showing usage of facility

Although a race facility, the automotive culture and symbolism it represents makes it a fitting destination for a show of this calibre. The spaces however are used differently as opposed to a race day. Entrance and parking to the event differed to the event mentioned above, this could be linked to the fact that only show cars were permitted to enter the facility. Upon entrance the character of the space changes drastically as opposed to the drag racing event. Spectators were able to move freely on the inactive drag strip. Show cars were lined on either side of the strip, creating a central circulation space whereby viewers could move freely.

Figure 89 Image showing pit garages used for sound competition *(By author, 2018)*

Figure 88 Image showing multi-use of undercover parking *(By author, 2018)*

Figure 87 Image showing multi-use of race track *(By author, 2018)*

Figure 86 Image showing multi-use of pit garages *(By author, 2018)*

The pit garages adjacent to the drag strip were rented out by the organizers as stalls to automotive based companies. Placed informally around the facility were a series of retractable, portable structures which were used as additional stalls, these were

used by manufacturers and privately owned businesses. The pit garage at the far end of the track was used for the sound competition whilst the undercover parking areas were converted into stalls in which memorabilia, automotive items and food were sold. These spaces were also rented out to private businesses and/or individuals for this purpose.

The event also included a drifting event which took place on the designated drifting track. This was however an exhibition event and was not conducted as a formal drifting event. This allowed spectators the rare opportunity to experience a drifting car in authentic conditions with a professional driver.

6.4 Third Spaces

6.4.1 Introduction

The third spaces used by automotive enthusiasts offers insight into the way in which they use these spaces, how they socialize and how the car is celebrated through it. Two different examples will be analysed, the first is an informal space where social gatherings and automotive activities occur organically, generally over the weekends. The next is an organized automotive event held annually.

6.4.2 Justification of case studies

Although the case studies mentioned below are not centred on architecture, they offer insight to the social dynamics of the existing car culture which has grown organically. It will look at the way people use spaces and how the car is included and catalyses social interaction.

6.4.3 Fuel Station, Corner of Electron Road and Umgeni Road, Durban

Section 2.4 of this document hypothesized the importance of the fuel station and the symbolism it creates. This section will look at an existing fuel station based on Umgeni Road, Durban to understand how this symbolism has impacted the car culture of Durban and how the space is used. Over the years, the vicinity of this fuel

station has been linked to illegal automotive activities and social issues which have plagued the local car culture. The automotive activities attract hundreds of like-minded automotive enthusiasts. As mentioned previously, the congregation of enthusiasts in spaces like these are derived from there being no dedicated facility in the Durban area.

Figure 90 Mapping showing usage of third space (*www.google.com, adapted by author, 2018)*

The fundamental workings of this space are that people park their vehicles within the private parking of the fuel station or directly on the road (on busy nights). They congregate on the verge of the busy road or next to their vehicles to watch as the cars race from the traffic light at the intersection of Electron Road and Umgeni Road in an Easterly or Westerly direction until the next traffic light. Naturally, this poses a major safety threat for the racers, spectators and general public using the roads.The informality of this space offers precedent for the social dynamics that should be implemented within a motor sport facility. The fuel station has evolved into a social hub, whereby on general nights when no racing activity happens, people still congregate to socialise due to the automotive culture attached to it together with other social catalysts such as fast food franchises. It has been observed that with the nature of the activities, the car becomes the centre of attraction; People generally congregate around it to socialise and share experiences. The essence of the car is movement, however when parked in a space like this and used by automotive

enthusiasts, the dynamics of it changes drastically. Below are illustrations of the way in which cars are used.

Figure 91 Image showing the start of a drag race on public roads *(https://www.youtube.com/watch?v=GZRkeIkHs6U&t=178s)*

Figure 92 Image showing deviant driving behaviour on public roads *(https://www.youtube.com/watch?v=GZRkeIkHs6U&t=178s)*

Although the architecture of this space does not enhance, nor facilitate the socialisation and gathering of people, the automotive culture attached to it draws automotive enthusiasts to it. The way in which they use this space and their vehicles, offers insight into the informality of this culture and how this can be translated into architectural spaces. The essence of this informality can also be found within Dezzi Raceway, whereby formal spaces have been provided, yet spectators choose to watch and socialise informally.

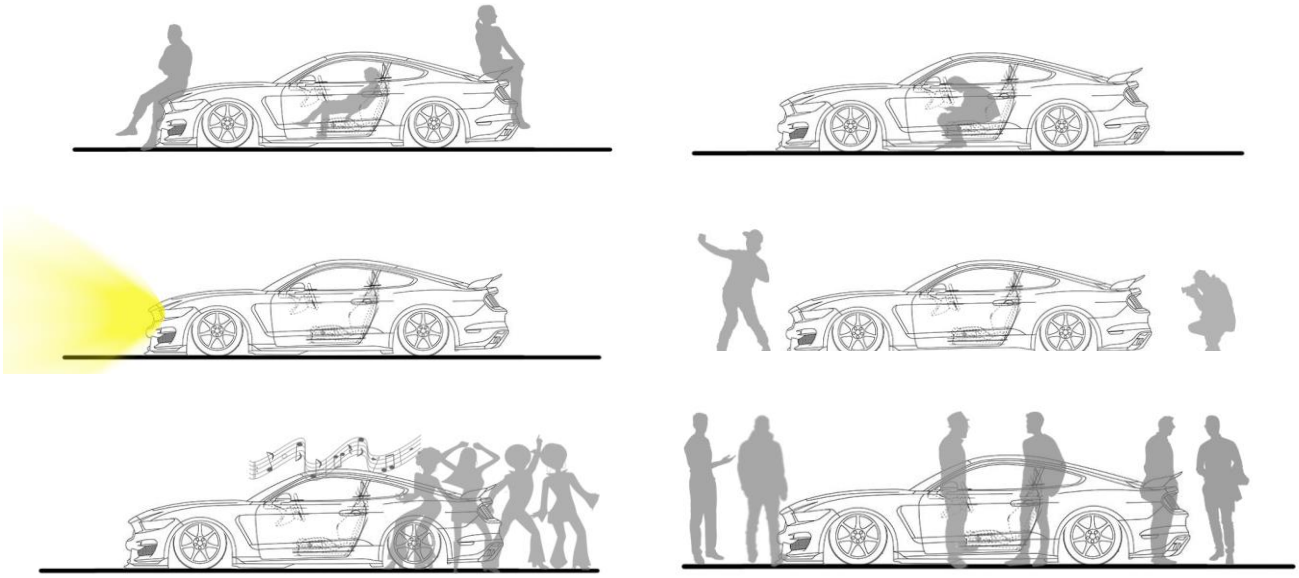

Figure 93 Image showing how the car is used informally *(By author, 2018)*

6.4.4 Concours d' Elegance, Durban Country Club, 2018

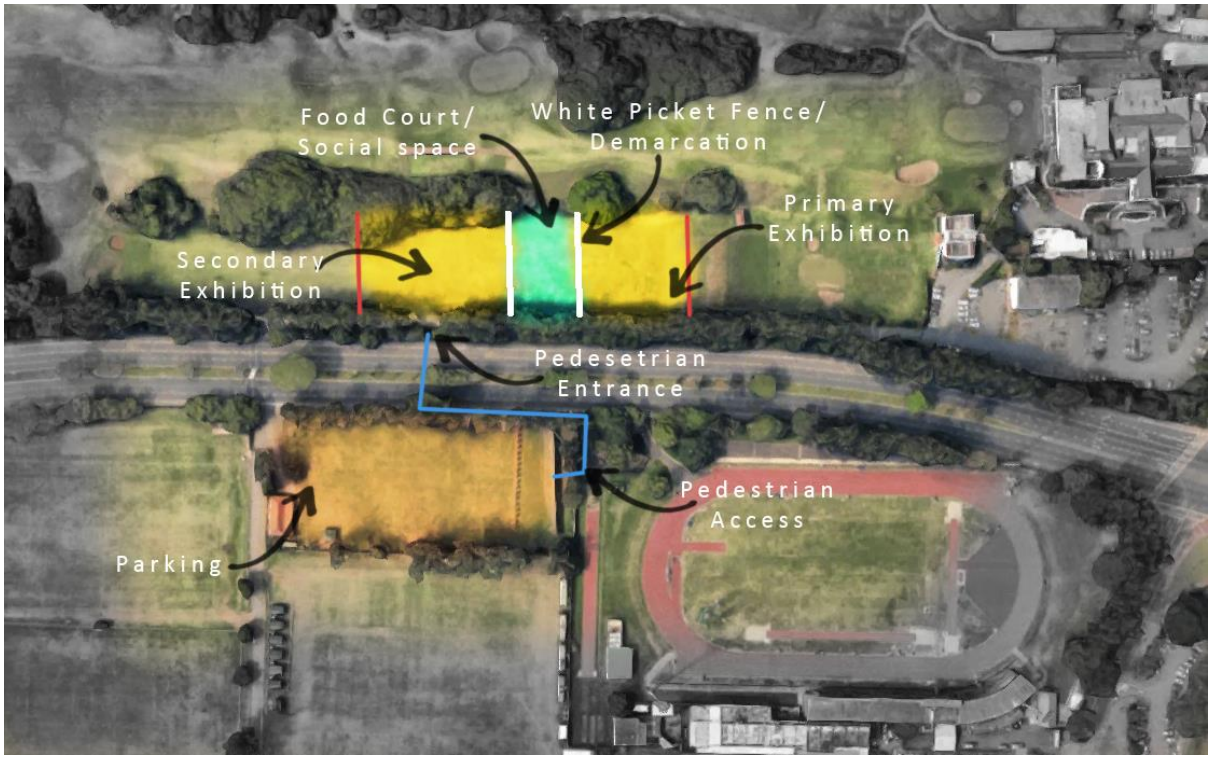

Figure 94 Map showing event layout (*www.google.com, adapted by author, 2018)*

Concours d' elegance is a show that debuted in 17th century France, where the elite would parade their horse drawn carriages through the parks in central France. Since the advent of the automobile, this show has evolved into a competition between car owners on the originality in aesthetics and mechanics of their cars *(www.concourssouthafrica.com).*

Concours d' elegance took place for the first time in Durban in 2018 and has been earmarked as an annual event going forward. It was a non-profit event, whereby all proceeds went towards the Tafta old age home. It showcased the vintage cars of Durban in an elegant event which took place at the Durban Country Club. The event used the golfing green on the country club, as the vehicles were parked side-by-side. Although the cars were the central attraction of the event, it drew on many other cultures to create a holistic and inviting event for all which included an exhibition of the Durban Regiment Pipe Band, a fashion show held by a local designer and live music by local artists.

During an informal interview with one of the organizers, it was found that major issues with regards to budgetary constraints came in the form of venue and parking, whereby both had to be hired out. The golf green was separated into three parts. On the far ends were the exhibition of the vehicles which was separated by the social space which accommodated food and refreshment stalls.

Figure 95 Image showing car show at Durban Country Club *(By author, 2018)*

Entrance to the facility was via the busy main road, with parking at the opposite sports field. The exhibitions on display in the first segment could be described as the secondary exhibition of modified vehicles and one gets the sense that the positioning of the vehicles were to direct the circulation of people into the next segment of the space. The secondary exhibition included stalls for Tafta and Sorbet Men. A white picket fence separated the areas and led to the next one, which was the social space. This included food stalls and refreshments with the social spaces defined through the use of temporary marquees. Due to the nature of the venue, shade wasn't adequately provided, therefore people were forced to use these marquees and gather around trees which were on the adjacent banks. The final segment was

the primary automotive exhibition space and the essence of the event which displayed the unmodified, vintage cars. The placement of the vehicles on display suggested that it was a space which promoted people to "linger" as they were set perpendicular to the placement of the cars in the first segment.

Figure 97 Image showing people congregating in shaded areas and around the car *(By author, 2018)*

Figure 96 Image showing white picket fence used to demarcate spaces *(By author, 2018)*

Figure 99 Image showing placement of cars which funnels people through the space *(By author, 2018)*

Figure 98 Image showing placement of cars which cause people to "linger" *(By author, 2018)*

It is evident that circulation through space plays a vital role in the way in which people use space. This event lacked built form in which people could be led through the space but using the exhibitions to funnel people created a hierarchy of spatial importance which ultimately guided people through.

6.5 Conclusion

Through the case studies mentioned above, it is evident that the built environment plays a vital role in the amalgamation of empowerment and culture. It can be seen

that in the skills development sector, little has been done in order to facilitate and integrate the social culture created around the automobile. Conversely, automotive social culture creates opportunities for sustainable development through events and spatial demarcation but is however hindered by the lack of a feasible, centrally located facility for it to be continuously self-sustaining. The case studies mentioned above offers insight into ways in which the phenomena of social and economic development can be integrated into architectural spaces.

Chapter 7 Analysis and discussions

7.1 Introduction

The following chapter presents a combination of empirical data collated through interviews and analysis of the case studies as mentioned in the previous chapter. The responses will be analysed through the theoretical framework presented within this research. Interviews were conducted at Dezzi Raceway and Shukela training centre. Therefore, the analysis will be split into two parts in order to isolate and understand the fundamentals of the research collected.

7.2 Shukela Training Centre

7.2.1 Reaction to interview questions

Within Shukela training centre, a total of five interviews were done. The interviews were conducted between two facilitators and three students. The same interview schedule was used in order to ensure the accuracy of information provided. Subsequently, the results from the interviews were generally very similar between students and facilitators. The overarching principle of these interviews was to understand the way in which the facility is used and how the students are empowered through the automotive industry. Due to the complexity of mechanical equipment, this facility will serve as a benchmark for the design intervention with regards to spatial dynamics and empowerment of society through the automotive industry.

- The general response to the facilities provided was that the facility is able to accommodate the learning experience with regards to mechanical equipment and general facilities. It has been noted from students and facilitators that adequate space is required for movement and teaching within the general workshop space.

- Most students who train at STC are already employed and funded by the company they're employed at. Although STC does all it can in terms of

recommendations and advice with regards to employment, they do not take responsibility for ensuring employment upon completion of the course.

- Extracurricular activities do not form part of the learning process at STC. Although it has been suggested that it could be beneficial, the theoretical aspect of the training is done within a short space of time therefore there is no time for extracurricular activities and students have to do this in their own social time.

- Social interaction during the learning process is promoted through group engagements and group activities. Students are required to fault find and brainstorm various real world scenarios. Social interaction during break times often occurs on various places around the campus such as the canteen, underneath trees and on benches and has been found that students share valuable knowledge during down time.

- It has been found that the ideal ratio that has worked for STC over the years is 1 facilitator to 12 students. However, due to the influx of students over the past year, this figure has grown substantially which has created larger classes which prove difficult to teach.

7.2.2 General discussions and theoretical analysis

Through the literature discussed in the previous chapter, STC will be analysed through the theories of empowerment and tectonics in order to understand the way in which this space is used.

Architectural Analysis

Empowerment

The theory of empowerment is about empowering people by giving them the tools they need in order to levitate their social mobility within society. Within the context of this study, it looks at how this can be done through social interaction and integration. The situated learning theory states that learning should happen within authentic

environments which mimic real world situations. Although the automotive training centre as provided by STC is not within an authentic environment, it does include many different disciplines within its learning space, similar to the Kawartha Trades Centre. Although these disciplines are not part of the same trade, they share various mechanical and trade related principles which can be shared among learners. The campus offers various spaces for interaction of students in order to share knowledge and experiences. The study program also includes real world mechanical repair cases on "live" vehicles, whereby the general public can have their cars fixed by the students, free of labour costs and only pay for the costs on replacement parts. This benefits both the public and the students as it simulates "real world" scenarios.

It is evident that the built form cannot make people learn nor socialize but it can create spaces which are conducive to learning and socializing. The following section will use the key principles as mentioned in chapter two relating to architectural spaces to understand the fundamentals of how it works.

- **Health:** natural light is provided through the large clearstory windows which is adequate for a space of this nature. Ergonomic considerations can be seen in the furniture provided for mechanical work and the large open spaces used for "live" vehicles within the workshop.

- **Stimulating principles:** stimulating principles are lacking within this institution and can be directly related to the form follows function design of the spaces. Transparency between disciplines is favoured due to the sharing of a workshop; however, little is done to visually connect students to the outside and natural environment. Material selection favours performance and practicality rather than tactile and sensory cues.

- **Adaptability:** the space has not been designed to be adapted for various uses. It has however organically been adapted by the users for different functions whereby different spaces are used informally and the building structure has been used for hanging of equipment.

- **Social learning spaces:** opportunity for social learning and interaction has been adequately catered for outside of the formal learning spaces. However, within these formal learning spaces little has been done in order to promote social learning and social interaction.

Architectural tectonics

As suggested previously, the building program has been successfully portrayed through the built form. Within the workshop space, the structural and construction of the form has been clearly defined and expressed through the natural state of the load bearing components. The industrialized form and character has been purely defined through the architecture itself.

Tectonic space

One gets the sense that the workshop space has been designed according to spatial requirements and climatic conditions. The high level clearstory glazing provides sufficient light, whilst minimizing direct sunlight due to their North/South orientation. With this however, the character of the space remains the same throughout the day. The structural members of the building have become part of the learning experience, with it being used as hanging spaces for equipment which directly relates to the character of the space. Little has been done in articulation of materials and finishes as it is predominantly functional and selected for their performance rather than aesthetic appeal due to the nature of the activities within this space.

Place making

The character of the learning space is purely aligned with learning. Little has been done to emphasize social learning and interaction internally. The space does not adequately emphasize indoor/outdoor relationships and little emphasis has been placed on the lateral boundaries. The high level windows provided create place which is constant throughout the day. The character the space however changes once in the amphitheatre as the "concrete phenomena" of the space changes drastically. The green spaces and abundance of trees and social meeting spaces

override the industrialized presence of the workshop. The raked amphitheatre allows for intimate social interaction and has the potential to facilitate the sharing of knowledge and experience.

Social analysis

Through this research, the skills development component has been enforced through the theory of empowerment and learning through social interaction. Chapter three of this document outlined the theory of empowerment through existing literature and various sub theories. Therefore this section will look at some of the responses from respondents and analyse them through this literature. Whilst the previous section of this chapter analysed the architecture of STC through this theoretical framework, this section will hypothesize the social, intangible aspects that can be implemented within an architectural intervention.

Situated learning theory

"They (the students) share a lot of (sic) knowledge in their social time"

- *Facilitator 1*

This suggests that people from different cultural backgrounds can share knowledge and experiences through different life experiences. It can be further stated that this can be applied to the social experience of learners and the way in which they interpret what has been taught during formal learning times and share their knowledge with each other. Therefore spaces which encourage social interaction must be implemented.

"We are given instructions and told to complete a task in a group. Most of the time we help each other"

- *Student 2*

With varying degrees of experiences and backgrounds, students are able to assess a task through different approaches and interpret the task in different ways. This creates a "community of practice" as suggested in the situated learning theory which links to how learning can happen informally through engagement with people who have similar interests.

"A large part of our training is on live, running vehicles to make it as realistic as possible….. We've had pensioners who had problems with their engines and couldn't afford labour charges to get the vehicle fixed, we fixed their vehicles and they (pensioners) only had to pay for replacement parts"

- *Facilitator 2*

A large part of the situated learning theory suggests that knowledge needs to be presented in authentic contexts. It is evident that facilitators have embraced this through fixing "live" vehicles which authentically simulate real world issues and faults. This also directly benefits the broader society as people who cannot afford vehicle repair costs can get their vehicles fixed at discounted rates. The situated learning theory also suggests that learning is most aptly done through practical training and mentorships.

"For us to train a person to be a mechanic in 33 weeks is virtually impossible. To teach them what I have learnt over 30 years is a major challenge. The mentor in their workshop plays a large role in the guidance of learning."

- *Facilitator 2*

The situated learning theory favours learning through mentorship and apprenticeship programs. It is evident that within the automotive industry, practical experience is of paramount importance. The designated time in which students are required to work between phases forms an integral part of the learning experience in which they are exposed to real world situations.

"It would be nice to have a place to work after training"

- *Student 2*

Although many students have secured employment, many require legitimate training in authentic automotive workshops. It can be suggested that by creating a centralized facility which integrates incubation centres, established automotive workshops and social interaction; students are able to secure employment and grow a network of like-minded people who can create employment opportunities.

"Learners came in as part of a development program which was externally funded. They had no interest in the trade (mechanics) which led to low work ethic…if you do a job you love, you'll never have to work a day in your life…you need the right mentality of students"

- *Facilitator 1*

"When you have a passion for mechanics, every new vehicle be it a truck, car, plane or ship grabs your attention"

- *Student 1*

It can be suggested that by instituting a training facility within an authentic environment, which is surrounded by similar socio cultural activities and like-minded individuals promotes learning and encourages the enrolment of students who have a general interest in the field.

7.2.2 Conclusion

Through analysis of the interviews and architectural spaces, further issues which indirectly affect the scope of this research have been identified as follows:

- Prospective students lack basic computer training. With advancement in learning methods and technology, computer based education is moving to the forefront of theoretical learning. Therefore computer training and access to computers create an important part of the learning experience.
- Students have suggested that due to the large scale, heavy duty machinery which is used. The inclusion of a gym facility to keep healthy and fit could prove beneficial for a facility of this nature.

The primary data collected through the case study and interviews done at Shukela Training Centre offers insight to and reiterates the importance of the principles suggested in the theoretical framework. It further offers insight into how the learning process can be enhanced through architectural interventions.

7.3 Dezzi Raceway

7.3.1 Reaction to interview questions

Interviews at Dezzi Raceway were conducted between participants and spectators of the KZN Drags event held in 2018. The same interview schedule was conducted for all participants. The questions were structured in a way that helps understand the fundamental characteristics of what constitutes car culture in the province. It also helped to understand the how these individuals were brought into this social culture. The case study done at Dezzi Raceway in the previous chapter focused on the built form around the facility. The purpose of the questionnaires, however, were to understand the social dynamics of car culture in general and was not focused on the facility itself.

- The general response was that people got involved in car culture through family and upbringing. Generally, their parents and/or family were car enthusiasts, which subsequently shaped their environment and they grew a love for cars.

- Unanimously participants felt that Durban lacked a dedicated space for automotive activities. They further stated that spaces where ungoverned automotive activities take place are overwhelmed with various social issues which plague the car culture of Durban.

- Car culture was mostly defined as "enthusiasm". Other ways in which it was defined was outlining the rituals and activities which automotive enthusiasts partake in, these include drag racing, car shows, spinning and drifting.

- Unanimously participants felt that people lack basic training in the general automotive industry and skills development will prove beneficial.

7.3.2 General discussions and theoretical analysis

Through the literature discussed in the previous chapters, Dezzi Raceway will be analysed using the theories of culture and architectural tectonics. This will offer insight to the way in which people use these spaces for automotive activities.

"I think for the modern guys, car culture is more of an informal street culture"

- *Participant 2*

As suggested previously, car culture in general has been defined as the informal activities and appreciation for the automobile. The term "street culture" can be attributed to the informal practices associated with it.

Identity

"I modify cars because as a car person I don't want to drive the same car as anyone else. I want to be different"

- *Participant 1*

"I feel like society doesn't want us to share our love for cars. Why won't they give us a space to enjoy our love for it?"

- *Participant 3*

Identity within car culture plays a vital role. People express their differences and preferences through their cars; through observations it is evident that they want to express this by exhibiting it. Social identity is defined as the culmination of an individual's standing within society. People who come together through culture generally possess varying social identities but their enthusiasm for the automobile creates a binding factor which breaks barriers and catalyses social interaction.

Culture

The large scale of this space directly shows the scale of the car culture which has grown in the province with various aspects of it found within this facility. Below is a look at the tangible aspects of this social culture as found within the facility.

Rituals

As mentioned in the previous sections, the facility is able to cater for all rituals related to car culture.

"I love all activities which have to do with cars. It makes me happy"

- *Participant 2*

"A handful of guys who race illegally and dangerously on the streets tarnish our reputation as car enthusiasts"

- *Participant 2*

"I personally do not understand the whole spinning and drag racing thing. But I do believe that a motorsport facility should incorporate everything"

- *Participant 2*

The rituals undertaken by car enthusiasts have been tarnished due to the illegal activities which happen in uncontrolled spaces. However, the rituals which have been identified through observations and interviews are vast and are a combination of a number of activities. These include:

- Car modifications
- Car Shows (show and shines)
- Drag racing
- Drifting and spinning
- Sound competitions

Through analysis of the case study, it is evident that should these activities be promoted in a safe, dedicated facility it could prove highly beneficial to society in order to promote social and economic development.

Symbols

"I grew up around cars and always had a passion for it…. Car culture is a love for cars and a group of guys and girls getting together and enjoying it together as one"

- *Participant 4*

The car itself is the most prominent symbol within this culture. It creates dialogue and sparks conversations between people who share the same values and enthusiasm. It is evident that everything about this culture is fabricated around the car, the way in which people use them, not just as commodities but as extensions of themselves.

During events held at this facility, all facets of automobile symbolism are portrayed. The facility however does not directly encourage it. It purely creates a space within an authentic environment for this to occur. Little is done with regards to built form in which this can be achieved.

Heroes

"People know of Elon Musk as a hugely successful South African yet nobody knows that Roy Byrne (one of the most successful formula one car designers ever) was born and raised in South Africa."

- *Participant 3*

The importance of celebrating heroes and role models within a facility of this nature cannot be overlooked. It can be suggested that if the scale of South Africa's motorsport and automotive heritage were to be celebrated, people will feel motivated to continue this legacy and can consequently promote individual and social development.

Little is done within this facility for heroes to be acknowledged. The media centre acknowledges race car drivers by creating a space for which awards can be handed out, but this space is multi-functional and is not dedicated to the purpose of celebrating the heroes within car culture nor the metaphoric hero of the automobile.

Culture as a driver for sustainable development

It is evident that culture has the potential to create sustainable development. The events as mentioned above create opportunities for automotive based businesses to create exposure of their brands within the automotive community. The facility however does not adequately cater for this. Businesses are forced to use third spaces and portable structures in order to facilitate this. Many forward thinking businesses have adapted to this by creating modified vehicles which can be driven to events such as these. These vehicles are fitted out with equipment which can be used for business exposure. It can be argued that due to the secluded location and lack of passing traffic, permanent facilities for small businesses is not a viable option and may not sustain it.

Architectural tectonics

The built form which can be found around this facility can be described as "functional". One gets the sense that these spaces were not designed according to climatic conditions or cultural relevance. The spaces are predominantly multi-functional and generally adapted for use per event. The form of structures such as the pit garages does share the essence of architectural tectonics, which is the expression of architectural construction. However, buildings such as the restaurant clad the exterior with advertising decals and signage. This gives the impression that the expression of architectural form was purely an act of functionality rather than a conscious decision by the designer.

Place making

As discussed in chapter four, place has been defined as a combination of various phenomena which create genius loci. The standalone architecture around this facility however does not do much to enhance the sense of place nor create place. Materiality and tactility is influenced by functional requirements rather than experiential. The monotony of the tarred surfaces and building materials adds to this notion. However, during an event the character of the space changes drastically through the inclusion of various cultural phenomena. The inclusion of aesthetically pleasing machines, the sound of roaring engines, music, smells of burning rubber and the experience of being able to touch and feel these machines creates a sense of place.

Chapter 8 Conclusions and recommendations

8.1 Introduction

This research was done to understand the culture created around the automobile in order to use it as a catalyst for social and economic development with architecture as the mediating factor. This chapter will look at how this was achieved through the objectives as set out in chapter 1 and provide design recommendations towards an architectural response.

8.2 Achieving the aims and objectives

Objectives

To explore and understand car culture and how it can influence architectural spaces

Chapter 2 looked at existing literature in order to conceptualize car culture through the theory of culture within a social context. The same lens was used in the analysis of the precedent study of Ferrari world and offered insight into the principles of how a car based culture can be translated into architectural spaces. Due to the lack of academic research within the field of car culture, empirical data in the form of case studies and interviews grounded this research within the local context and offered insight into the spatial requirements which will encapsulate and facilitate car culture. These architectural spaces will be further discussed in the next section of this chapter.

To investigate skills development and fundamental principles of empowerment through architecture

Car culture was defined as a social phenomenon. Therefore, chapter 3 investigated how skills development and learning can be implemented through social interaction via the situated learning theory. The facilitators interviewed concurred with the

principles as suggested in the theoretical framework. Micro design of architectural spaces were suggested which enhance the learning experience whilst the case study offered insight into spatial requirements.

To generate architectural principles that informs the design of a motorsport facility that integrates car culture and skills development

The focus of this study is ultimately the amalgamation of car culture and skills development. Chapter 4 hypothesized a way in which these can be integrated through the use of architectural form and spaces via the theory of architectural tectonics. The theory architectural tectonics generates architectural principles on how place can be created. The creation of place ultimately promotes and sustains social interaction by creating opportunities for it to happen.

8.3 Accommodation and spatial requirements

Much of the empirical research was founded on spatial requirements. Through primary and secondary research, the following spaces would be required.

Accommodation	Quantity	Area x quantity
Training Workshops	1	1 200sqm
Classrooms	6	40sqm x 6
Offices	6	9sqm x 1
Reception	1	20sqm x 1
Managers Office	1	13sqm x 1
General Offices	2	9sqm x 2
Admin Office	1	20sqm x 2
Boardroom	1	40sqm x 1
Staff Lounge	1	25sqm x 1
Student Cafeteria	1	100sqm x 1
Parts store	1	36sqm x 1
Tools store	1	36sqm x 1
Sick bay/Infirmary	1	9sqm x 1
Computer room/Media Centre	1	60sqm x 1
Trade test rooms	2	36sqm x 2
Oasis Space	1	50sqm x 1

Museum/Exhibition space	1	1 400sqm x 1
Coffee shops/restaurants	2	100sqm x 2
Spares and aftermarket parts	3	200sqm x 3
Workshops	4	90sqm x 4
Incubators	3	90sqm x 4
800m Drag circuit	1	N/A
Drift Circuit	1	N/A
Spinning and skid pans	1	N/A
Exhibition hall	2	500sqm x 1
Safety briefing room	1	90sqm x 1
Showrooms	3	
General fitting workshops	3	200sqm x 3
Medic/Infirmary	2	12sqm x 2
Safety and awareness centre	1	300sqm
Public ablutions	As per SANS 10400	
Admin and offices for facility	4	10sqm x 4

General

- Parking
- Camp Sites
- Public open spaces
- Car exhibition spaces
- Troubleshooting forum spaces

Urban Design

- Provisions for street circuit
- Hotel
- Tourism centre
- General retail

8.4 Conclusions to research

Through the research presented, it is evident that not enough is being done in order to facilitate the growing car culture of Durban. The third spaces used by automotive enthusiasts will always be riddled with social issues. By creating a dedicated facility

for automotive activities to occur not only facilitates these activities but also creates opportunities for economic growth within the automotive sector.

The theoretical framework conceptualized the car culture in Durban by defining it through the theory of culture. The relationship man has to this commodity is beyond mere materialistic value and these machines take on a totemic, spiritual value to those involved with it. It is evident that the implementation of culture in building society socially and economically is of vital importance. In order to create sustainable developments, culture must be at the heart of it.

Car culture has developed into a social culture; therefore empowering society needs to be within a social context. Empowerment is the ability of an individual to change his/hers own life. The situated learning theory hypothesizes how this social construct of culture can be implemented and used in order to facilitate and enhance learning.

The focus of this dissertation is how culture and empowerment can be integrated through architecture. The theory of tectonics offers an opportunity for an architectural response through architectural construction and creating place through architectural spaces and materiality. The creation of "place" subsequently creates an environment for social interaction which further promotes social and economic development.

The precedent studies identified provide insight into how the aforementioned has been translated into architecture on a global scale. Ferrari world has successfully integrated the Ferrari brand into building forms by drawing on symbolism and user experiences whilst the Kawartha Trades Centre successfully integrated social learning into architectural spaces. The common thread between these two studies is the use of architectural tectonics to achieve this.

Case studies within a local context provided valuable insight into how automotive skills development has been catered for in Durban. Shukela Training centre provided spatial requirements for a building of this typology. However, this centre lacks the cultural integration which this research is founded upon. Dezzi Raceway caters for all facets of car culture, however these are done in multi-purpose spaces designed

around the car. The built form does little to enhance the user experience which is pivotal to a facility of this nature. Although the facility does not cater to skills development, it offers opportunity for economic growth through the social aspects found in the rituals, symbols and values of car culture.

The result of this research has shown that a facility of this nature needs to integrate culture and empowerment through built form. It has shown the scale of the car culture in Durban and should it be harnessed through architecture, the socio-economic opportunities it may create are immense.

8.5 Design recommendations

The following guidelines will be used in order to create a multi-purpose motorsport facility in Durban. The facility culminates in the integration of cultural and empowering spaces through architecture. It must be emphasized that the research is founded on car culture which has been found to be informal in nature. The informality in terms of usability and social interaction is what drives the car culture in Durban.

Below are a set of guidelines for the design proposal:

General architectural response

- People centred: Although this research is based upon the automotive and the role it plays in society, the design proposal must be people centred. The scale of spaces and circulation through areas must be primarily designed for the individual as opposed to the car.
- Urban linkages and urban stitching: the facility must be integrated into the chosen site.
- Social interaction: through this research, it has been found that in order to achieve the objectives as set out, the architecture and built form must promote social interaction.

Response to car culture

- Rituals: all rituals as mentioned in the previous chapters must be incorporated. However, it must be noted that these rituals are a catalyst for social interaction and economic growth.
- Heroes: it is important to emphasize that heroes are not primarily within a pop culture or international context. Local heroes exist and they include the race car drivers in which this facility caters for. Therefore, the general public should be able to integrate and interact with them. The motorcars which are used form a metaphoric hero and should also be integrated. This can be done through dynamic museum and exhibition spaces, which are integrated with the race paddock areas.
- Symbols: the defining symbol of this culture is the car itself. It should therefore be pronounced and celebrated through architectural spaces. Therefore, the spaces created by the building should create opportunities for social interaction around the car.
- Relation between man and machine: It is evident that automotive enthusiasts have a spiritual connection to their vehicles. However, they use it in a vast number of ways which extend beyond movability. The stationary car becomes a catalyst for social interaction primarily by the way it used. Therefore, provision for informal gatherings of people and their vehicles must be promoted.
- Culture as a driver for sustainable development: the economic merits of car culture goes beyond skills development, provisions must be made for general retail and workshops which facilitate the culture and promotes economic growth for new and existing businesses.
- The informality of the car culture identified must be interpreted and facilitated through this facility. Provisions must be made to harness the existing, informal culture.

Response to empowerment

- Situated learning theory: learning within authentic environments is of paramount importance. Therefore, the skills development centre must integrate and react to the socio cultural activities happening within the facility

- Knowledge into practice: business incubators offer opportunities for growth. A series of business incubational facilities must be provided and link to existing, established workshops to provide support and assistance.
- Micro design in learning environments: people centred architecture must be promoted between spaces. All principles relating to Health, stimulating principles, adaptability and social learning spaces as mentioned in chapter 2 must be considered.

Integration of spaces

- Architectural tectonics: construction and materiality of the built form must be expressed through the architecture. The art of construction must be celebrated and emphasized through architectural form.
- Tectonic space: the building must be moulded around the environmental, social and economic climate of the areas. The outdoor social spaces, which plays a prominent role in a facility of this nature must be enhanced through an architectural tectonic approach.
- Place making: place making is formed through the culmination of various entities which are the tangible and intangible. Architecture must incorporate these traits and enhance it through materiality and tactility of architectural space.

The culmination of all principles mentioned above is a reflection of the research findings and creates a holistic intervention which successfully integrates the culture which has formed around the automobile and empowering society through it.

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Part 2

Design report

Figure 100 Part 2 Cover Page (By author, 2018)

Chapter 1 Project description

1.1 Introduction

The following section presents a design report for a multi-purpose motorsport facility in Durban. The design will respond to the research found throughout this dissertation and use architectural principles as suggested in the last chapter of part one.

1.1.1 What?

The design proposal responds to the existing, informal car culture of Durban in order to promote social and economic development. The intention is to create a dedicated space for automotive enthusiasts to congregate and participate in automotive related activities in a safe environment. Furthermore, the social integration of people from different backgrounds create opportunities for the cross pollination of ideas and knowledge around the car itself which serves as a catalyst for economic growth through the development of skills and training within the automotive sector.

1.1.2 Who?

The designs primary focus is for automotive enthusiasts. Furthermore, it will benefit the general public, whereby they will be able to visit the facility for all automotive related issues, such as motor mechanics and appreciation of the car.

1.1.3 Why?

The social and economic opportunities, as identified in part one of this document can be implemented in a central location which integrates people from all walks of life with a common interest.

Chapter 2 Proposed client and building programme

2.1 Proposed Client

The client, Tuner School, is a privately owned automotive modification school, based in America. Owned by Hennessey Performance who specialize in automotive modifications and an independent vehicle manufacturer (http://hennesseyperformance. com/about/), Tuner School is the only facility globally whose objective is to train individuals on vehicle modifications (https://tunerschool.com/about/).

Figure 101 Proposed client, Tuner School *(https://tunerschool.com/about/)*

Figure 102 Proposed client *(http://hennesseyperformance. com/about/)*

2.2 Detailed accommodation requirements

Below is a detailed description of the major accommodation requirements and facilities, as mentioned in the previous section and how it responds to the research.

2.2.1 Response to skills development

Training workshop

Provides a dedicated space for training in motor mechanics and vehicle modifications. Furthermore it creates an opportunity for the general public to have

their vehicles fixed and/or modified with no labour charge. This in-turn creates authentic, real world experiences for the students.

Classrooms

A space whereby theoretical learning occurs.

Offices

General office space which facilitates the training centre.

Cafeteria

The cafeteria becomes the social hub of the training centre whereby the exchange of knowledge and experiences happen during student down time. The cafeteria should link to the social, courtyard space in order to promote interaction between students and automotive enthusiasts.

Trade test rooms

A space as required by NAMB, dedicated to the running of trade tests in order to gain accreditation

Oasis Space

Green space which is integrated into the workshop that provides refuge and a connection to nature whilst enhancing indoor/outdoor relationships.

2.2.2 Response to car culture

Museum and exhibition space

This space is used to exhibit the heroes of Durban's car culture. The heroes are identified as people who have excelled in the rituals of car culture, together with cars manufactured in South Africa, for South Africa. The space should be integrated with the paddock/waiting areas of the drag strip, therefore creating a dynamic exhibit whereby the general public are able to interact with race drivers and their cars.

Coffee shops and restaurants

Coffee shops and restaurants provide a meeting place for the general public; it should open onto the main social spaces which have been identified as the start of the drag strip and open courtyard space.

Spares and aftermarket shops

These stores specialize in the sale of vehicle spares and aftermarket parts which create job opportunities in sales and fitting of parts.

General fitting workshops

Workshops whereby parts purchased from the above-mentioned stores can be fitted by students, who will be able to obtain additional income and gain further real world experience.

Incubator workshops

These workshops provide incubation for start-up businesses. Skilled automotive technicians are able to rent these spaces and supporting facilities for a minimal cost and for a limited duration in order to grow their business. After the designated period, they will have to find premises elsewhere, preferably within the vicinity of the facility.

Workshops

Workshop spaces for established automotive workshops, these spaces should be provisioned next to incubator workshops to provide support.

800m Drag Strip

This facilitates the ritual of drag racing. The social spaces, as identified through the case study should be enhanced through the built form. On days whereby the drag strip is inactive, it becomes a multi-function space which can be used by cyclist, runners and remote control cars/airplane enthusiasts.

Drift circuit

Facilitates the ritual of drifting, on days where the drift circuit is not in use for the purpose of drifting, it becomes a go-kart track which can be used by the general public.

Spinning and skid pans

Facilitates the ritual of spinning, this should be integrated within the drift circuit.

Spectator stands

As concluded through the case studies, spectator stands are provided at the start line, the middle and at the end of the drag strip. Spectator stands for drifting and spinning should be incorporated around the track.

Showrooms

The showrooms are provided for vehicle sales of new and used vehicles, the workshops within these showrooms also provide additional training and mentorship for students using the facility.

Parking

The parking space becomes a hub of social interaction, within a facility of this nature; the users congregate and participate in informal activities around their vehicles. Therefore, the parking bays should be a minimum of 3.2m x 6m to allow movement around the car. The parking also becomes a multi-function space to enhance social interaction, therefore materiality is of vital importance, thus it should be grassed with trees to provide shading. On days whereby the facility is not in use for events, the green space becomes a family area and general social space.

Public open space/courtyards

The courtyards created by the building become a social hub, similar to the parking area. This area should be designed to promote social interaction through the use of low level pergolas and finishes such as grass and paving to enhance the sense of place by creating horizontal (floor and roof) boundaries. The courtyard space also becomes a forum area, similar to an online forum where individuals constantly ask

for advice, the general public and automotive enthusiasts will be able to park their vehicles on the hoists/lifts provided to get modification and/or troubleshooting advice from fellow enthusiasts. This culminates in the cross pollination of ideas, knowledge and experience.

Chapter 3 Site selection and analysis

3.1 Site selection

The site was selected on the basis of the following:

- It is Centrally located
- Within an automotive context. I.e. informal and formal automotive activities
- The site is within a sporting precinct
- The North-South axis of the site is 800m long which creates an ideal length for the rituals in which these automotive enthusiasts partake in
- The site is away from residential zoning

Figure 103 Urban layout (www.google.com) adapted by author (2018)

- It has previously hosted large scale motorsport events. I.e. Top Gear Festival, A1 Grand Prix, Ethekwini Motorshow. These events set precedent and created a framework for a street (racing) circuit which runs around the site
- Close to public transport routes and interchanges

3.2 Site location

The site, as shown on the map above is located on 31 Battery Beach Road, Durban. It is located adjacent to Moses Mabhida Stadium.

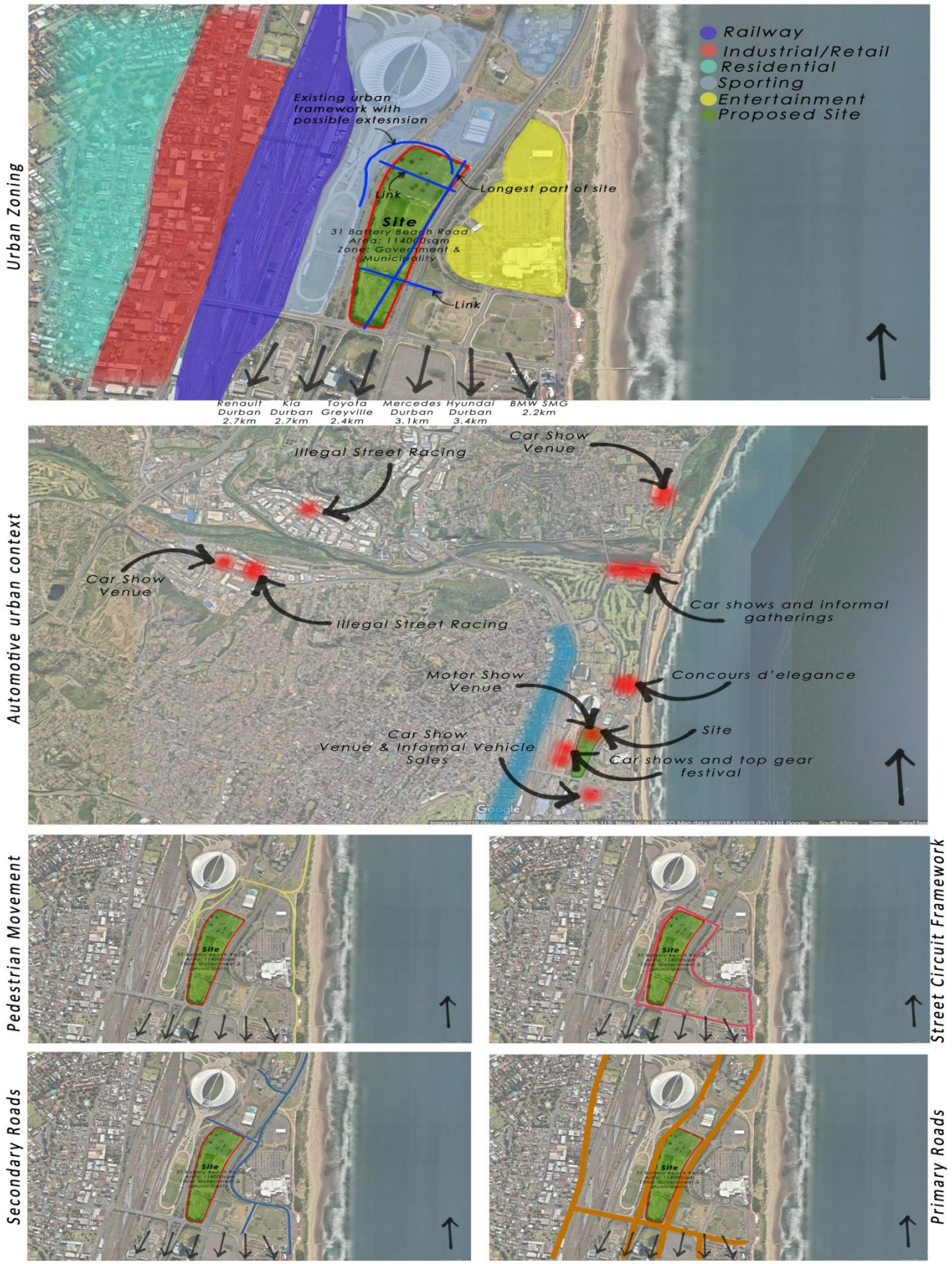


Figure 104 Maps showing contextual and site analysis (www.google.com) adapted by Author, 2018)

3.3 Urban context

The site is located in Central Durban. The immediate context includes a range of sporting activites such as football, swimming, rugby and golf. The two major landmarks around the site include Suncoast Casino and Moses Mabhida stadium. The site is positioned between these two landmarks and is fundamentally an "island" site with little interaction to the urban context. In close proximity to the site are a variety of automotive related activities; included in this is Umgeni Road, which hosts a range of automotive workshops and car dealerships. Also included in this is a range of informal automotive activities as shown in the map above.

3.4 The site

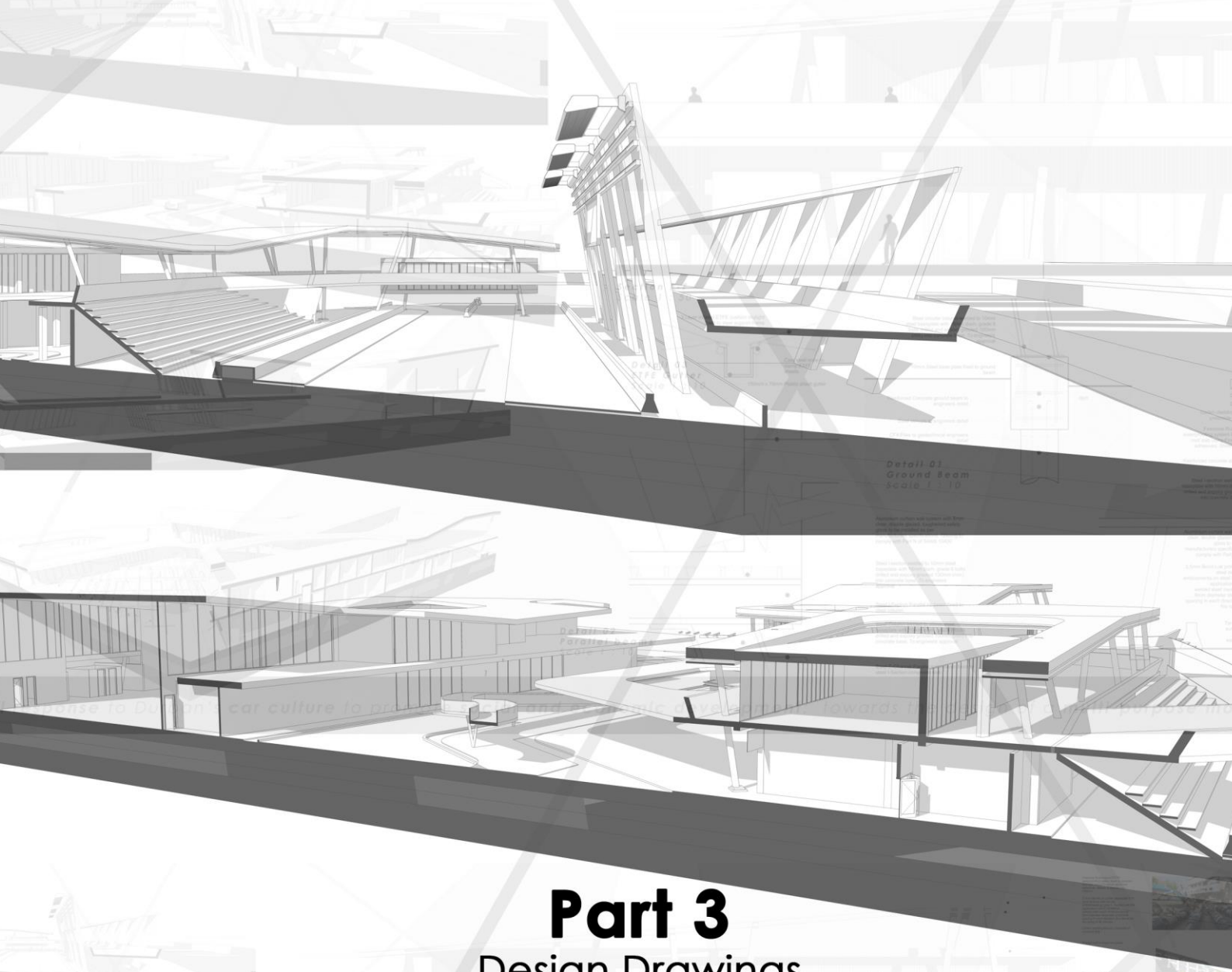
The 114 000sqm, vacant site runs from Battery Beach Road to Sandile Thusi Road. It is approximately 800m long at the longest part. It has been previously used to host a number of automotive related activities such as the Top Gear Festival, A1 Grand Prix and the Ethekwini Motor Show. This suggests that it has an automotive symbolism attached to it whereby people would have experienced it in different forms and have different memories of it. The site lacks urban linkages and could potentially be a catalyst for the connection of two of Durban's largest landmarks, Moses Mabhida Stadium and Suncoast Casino.

Chapter 4 Conclusion

The research concluded suggests that there are four main principles which the design needs to address:

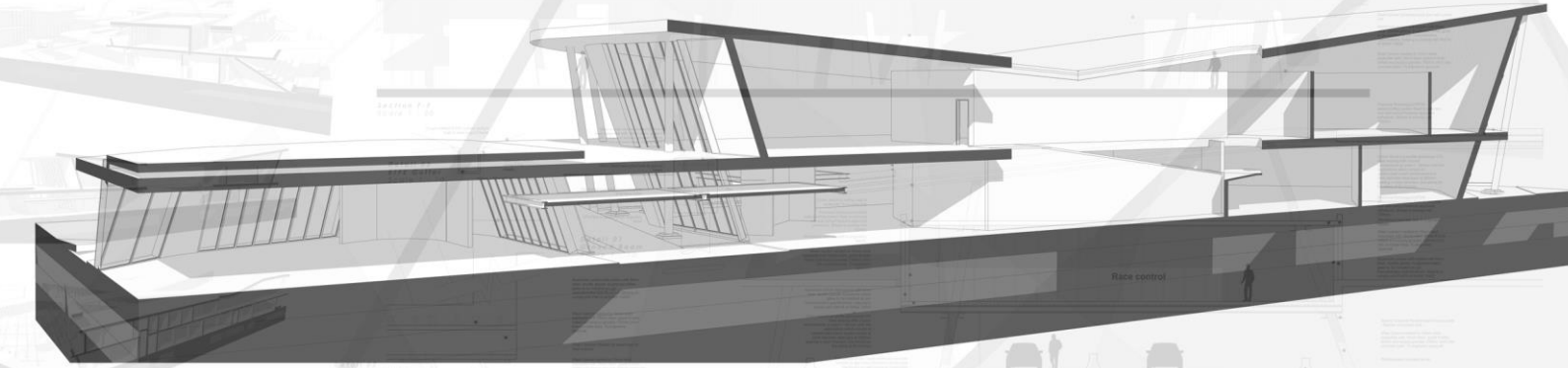
- Promotion of informal car culture
- Socially centred spaces which facilitates the transfer of knowledge
- Creating place through architectural form
- The site needs to create urban linkages so it's stitched into the urban fabric.

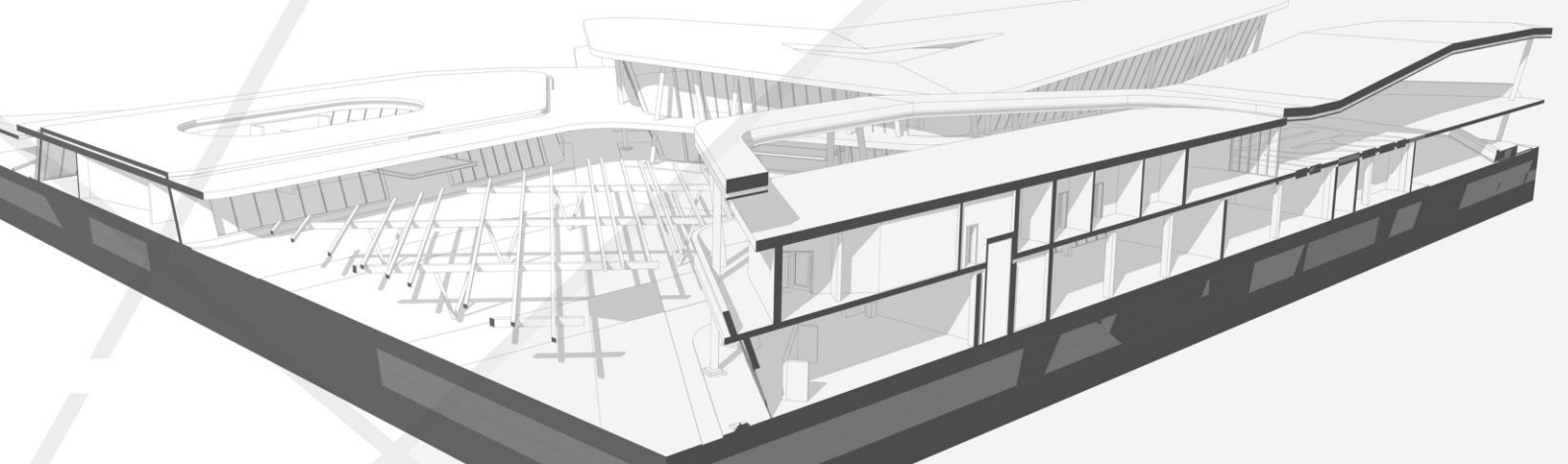
The next section presents the architectural drawings as a culmination of the research presented above.



Part 3

Design Drawings





Hella Slammed!

My Fenders Hate Me

illest

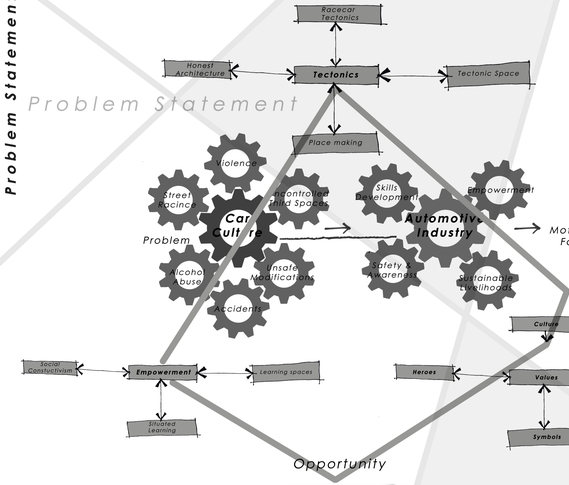
VTEC KICKED IN YO!

BLOWN

eat sleep JDM

An **architectural response** to Durban's **car culture** to promote **social and economic development**: towards the design of a **multi-purpose motorsport facility**

Problem Statement



GDP

Automotive industry
7.2%
R59.46bn
Employs 900 000

12 027 860
Registered Vehicles

TUNER SCHOOL

Opportunity for economic development through knowledge

Aims and Objectives

- *To explore and understand **culture and how it can influence architectural design***
- *To investigate skills development and the fundamental principles of **empowerment through architecture***
- *To generate **architectural principles that inform the design** of a motorsport facility that integrates car culture and skills development*

Theoretical Framework

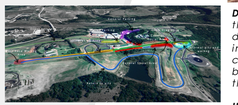
Culture
Hofstede (1984) States that "Culture is to human collectivity what personality is to the individual" He further goes on to say that culture is the programming of the mind which distinguishes the characteristics of one group to another. It is a dynamic phenomenon which changes as society changes be it technological or generational changes.

Empowerment
Zimmerman (1995) implies that empowerment focuses on identifying capabilities rather than focusing on risks or disadvantages. It explores environmental influences of social problems instead of blaming victims. Interventions which utilize empowerment in order to improve wellness focus on providing opportunities for society to develop knowledge, skills and use the skills developed by professionals as collaborative entities rather than that of an authoritarian (Perkins and Zimmerman, 1995).

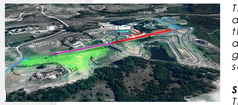
Tectonics
Karl Botticher describes architectural tectonics simply as the activity of forming a building. He further states that architecture has previously imitated objects and nature whereas tectonics noted that the objective of architecture should be the expression of the dynamic and static building forces which hold the building up (Schwarzer, 1993). Frampton (1995) further explains that tectonics within architecture is the science of art within construction and that tectonics is "aesthetic rather than technological category". He further states that the ontology of materiality and building technology should be expressed through architectural form in order to create architecture that is true to itself. The theory of tectonics will serve a vital role in the integration of knowledge and architecture. It creates a bridge which links society to architecture and conceptualizes the mechanics of the built form.

Ferrari World
Ferrari world successfully integrates architecture and the culture created around the ferrari brand through an experiential journey for the user, the principles around the theory of culture and tectonics are clearly evident

Kyalami Race Track
This facility is located in JHB and was built to cater for the growing motorsport. It is however a prime example of the globalization of local car cultures as it does not cater for local activities and is based on international events. The facility does not allow the basic user to experience the space as a professional would and does not embrace the informality of South Africas car culture

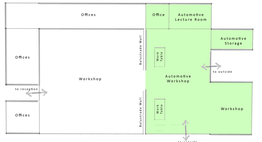


Dezzi Raceway
this is a facility located 120km outside of durban and is privately owned. It successfully integrates the local car culture through the facilitation of a racetrack, however nothing is being done to empower enthusiasts and youth thorugh this space.



Umgeni Road (Third Space)
This area is notorious for illegal racing activities and social issues. This was used to undersnatd the dynamics of car culture within a social aspect and it helped understand how peple gather and use the automobile as a catalyst for social interaction

Shukela Training
This is an automotive training facility located in Mount Edgecombe. It caters for autootvie training. It however does not integrate cultre into learning spaces.



Site Selection & Client Brief

Client

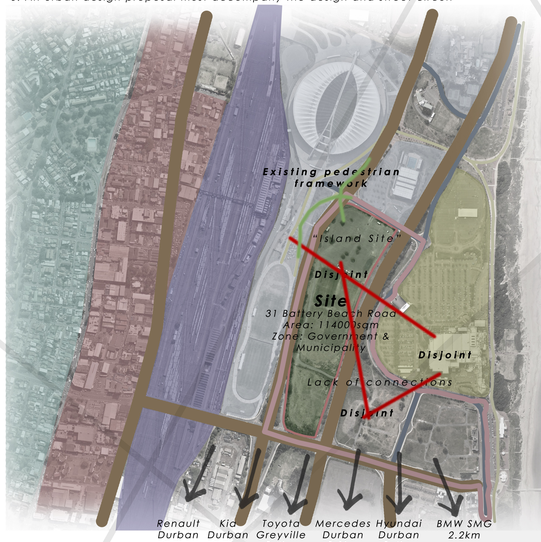
Hennessey is a vehicle manufacturer based in USA. They have established a new form of automotive training in vehicle modifications and is the only known school of its kind in the world. The have found synergy in the formal automotive culture with informal modifications. They aim to grow Tuner School by drawing on local car cultures globally whilst promoting safe vehicular modifications.

Hennessey

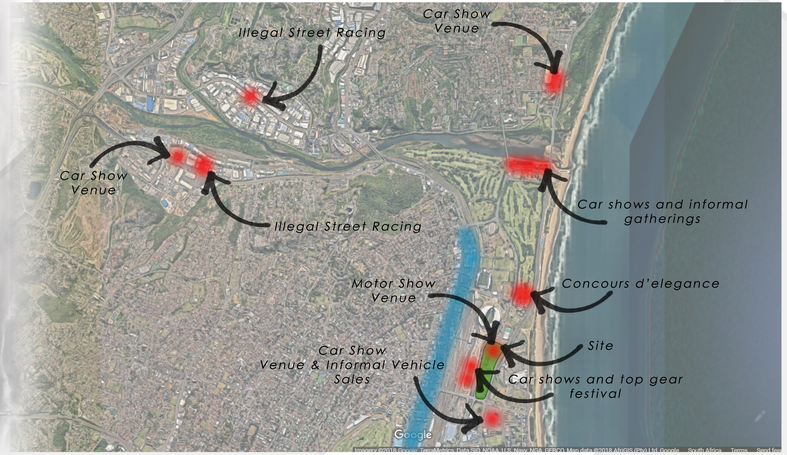
Site Selection Criteria

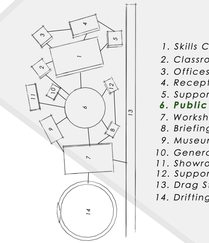
The location of the facility must adhere to the following guidelines.

1. *It must be centrally located for ease of access for all users*
2. *Must be away from residential zoning as far as possible*
3. *Must be within a sporting precinct*
4. *It must link to the existing contextual infrastructure*
5. *Possible inclusion of a formal street circuit*
6. *An urban design proposal must accompany the design and street circuit*



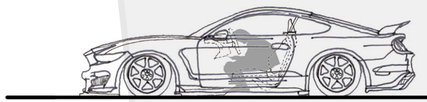
Accommodation	Quantity
Skills Development	
Workshops	6
Classrooms	6
Offices	6
Reception	1
Managers Office	1
General Offices	2
Admin Office	1
Boardroom	1
Staff Lounge	1
Student Cafeteria	1
Parts store	1
Tools store	1
Auditorium (120 People)	1
Sick bay/Infirmary	1
Computer room/Media Centre	1
Trade test rooms	2
Total	
Culture	
Museum	1
Themed coffee shops/restaurants	TBD
Spares and aftermarket parts	TBD
Workshops	TBD
Incubators	TBD
800m Drag circuit	1
Drift Circuit	1
Spinning and skid pans	2
Exhibition hall	2
Supporting structures	
Medic/Infirmary	2
Safety briefing and awareness rooms	2
Public ablutions	As per SANS 10400
Admin and offices for facility	TBD
General	
Parking	As per SANS 10400
Camp sites	TBD
Grand stands and seating	TBD
Public open space	TBD
Gathering Areas	TBD
Car exhibition spaces	TBD
Ticket Office	TBD
Urban Design	
Provision made for street circuits	
Hotels	
Tourism centres	
Small Scale Student Accommodation	
Links to existing sporting and recreation infrastructure	

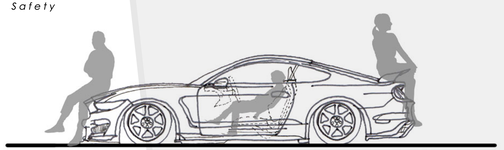




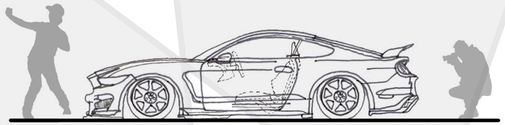
1. *Skills Centre*
2. *Classrooms*
3. *Offices*
4. *Reception*
5. *Supporting spaces*
6. ***Public social space***
7. *Workshops & Incubators*
8. *Briefing Rooms*
9. *Museum & Exhibition*
10. *General Retail*
11. *Showrooms*
12. *Supporting Spaces*
13. *Drag Strip*
14. *Drifting & Spinning*

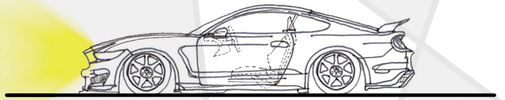
Conceptual Development & Design Drivers

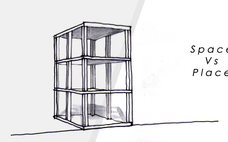

Safety

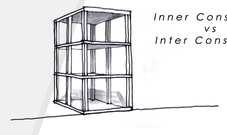

Furniture

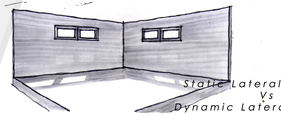

Jukebox

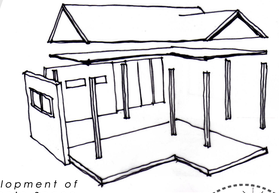

Sculpture

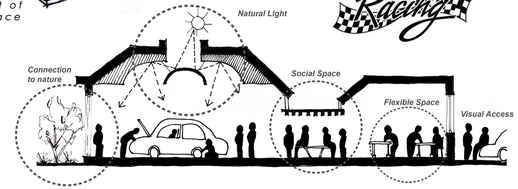

Lighting


Space Vs Place


Inner Conscious vs Inter Conscious


Static Lateral Members Vs Dynamic Lateral Members


Development of Tectonic Space



Principles of people centred design

Site Development

Site Plan and Sections

Urban Linkage

Noise and Social Space

Site Development

Building Development

Form Development

West Elevation
Scale 1 : 200

Section C-C
Scale 1 : 100

Manufacturer Exhibit

Urban Link

Media Centre/ Hero Hall

Museum

Section D-D
Scale 1 : 100

Takeaway Kitchen

Ablutions

Takeaway Kitchen

Takeaway Kitchen

Takeaway Kitchen

East Coast Drifting

Aftermarket Exhibition/ Cafe

Kitchen

Autostyle (Retail)

Denkit Hobbies (Retail)

Paddock Dyno-Tuning

Open Walkway

Section E-E
Scale 1 : 100

Open Walkway

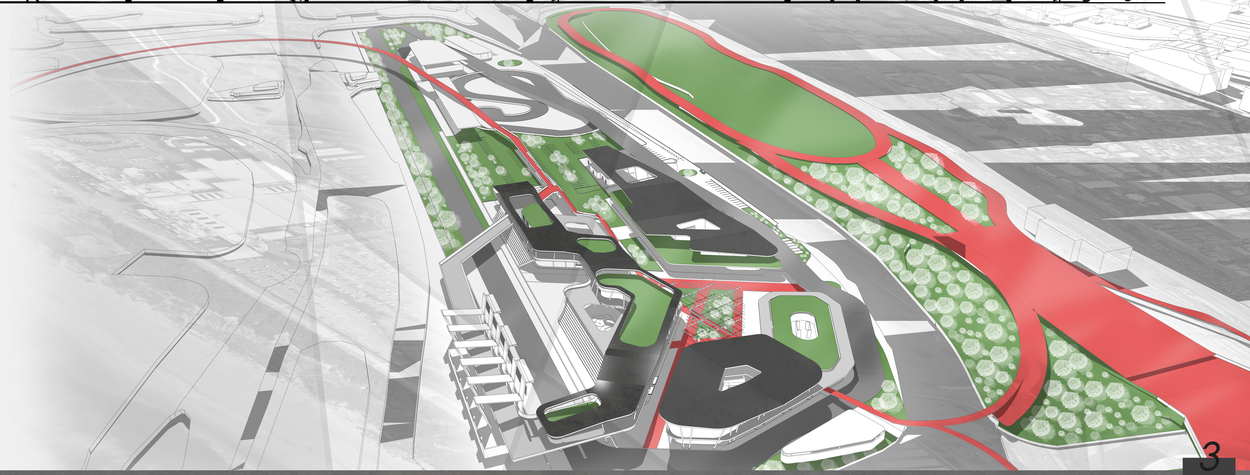
Race Control

Open Walkway

15m Safety Barrier

Drag Strip

15m Safety Barrier



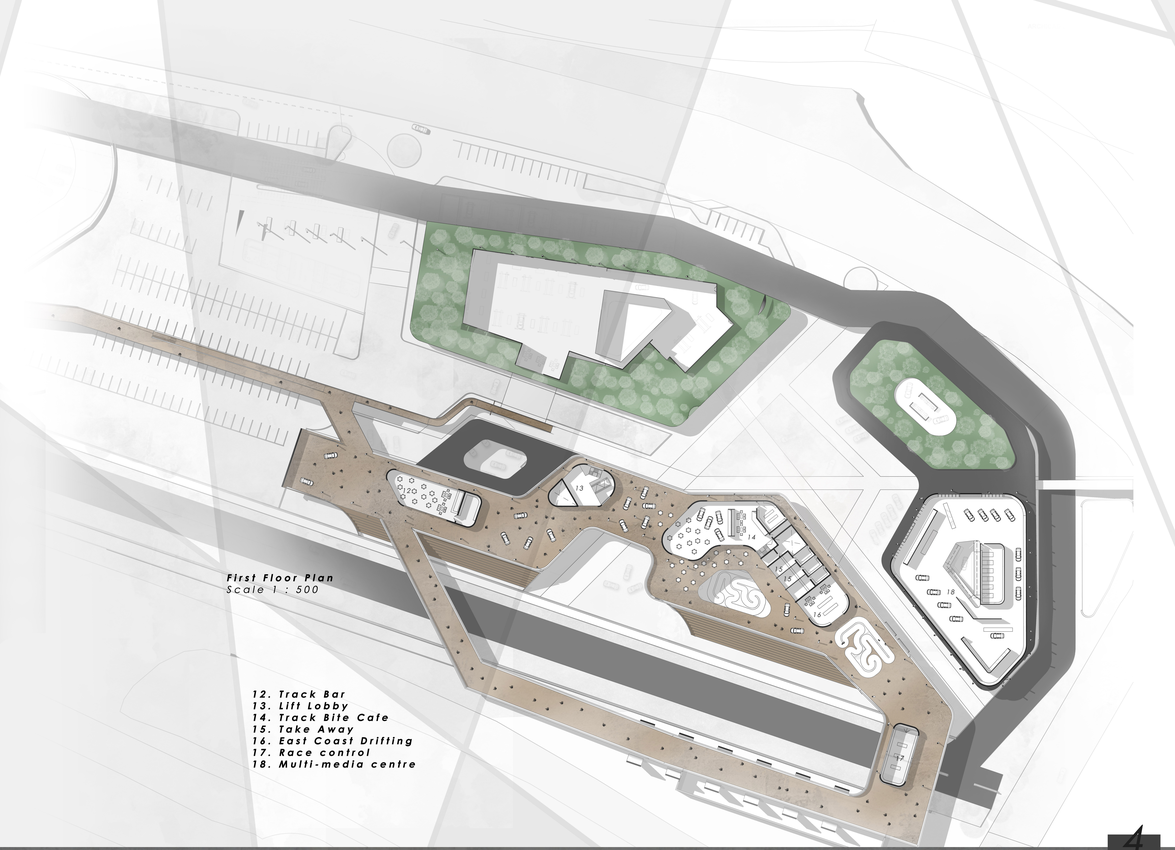
An **architectural response** to Durban's **car culture** to promote **social and economic development**: towards the design of a **multi-purpose motorsport facility**

Priyen Chetty

Floor Plans

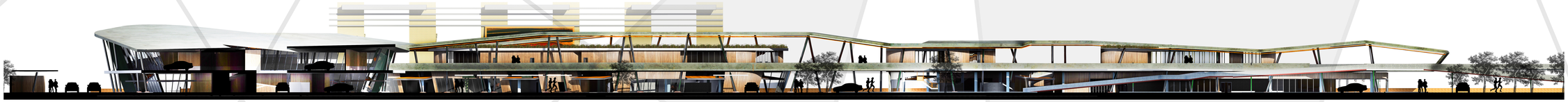
1. Retail
2. Merchandise Store
3. Safety and awareness centre
4. Dyno & Stereo Centre
5. Workshop
6. RC Test track
7. Aftermarket exhibit
8. Drag Paddock Dyno Tuning
9. Safety Briefing Room
10. Museum
11. Manufacturers Exhibit
19. Fuel Station
20. Parking
21. Drift Track
22. Drag Strip

Ground Floor Plan
Scale 1 : 500



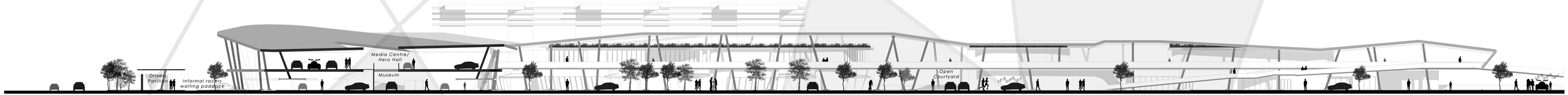
First Floor Plan
Scale 1 : 500

12. Track Bar
13. Lift Lobby
14. Track Bite Cafe
15. Take Away
16. East Coast Drifting
17. Race control
18. Multi-media centre



West Elevation
Scale 1 : 200

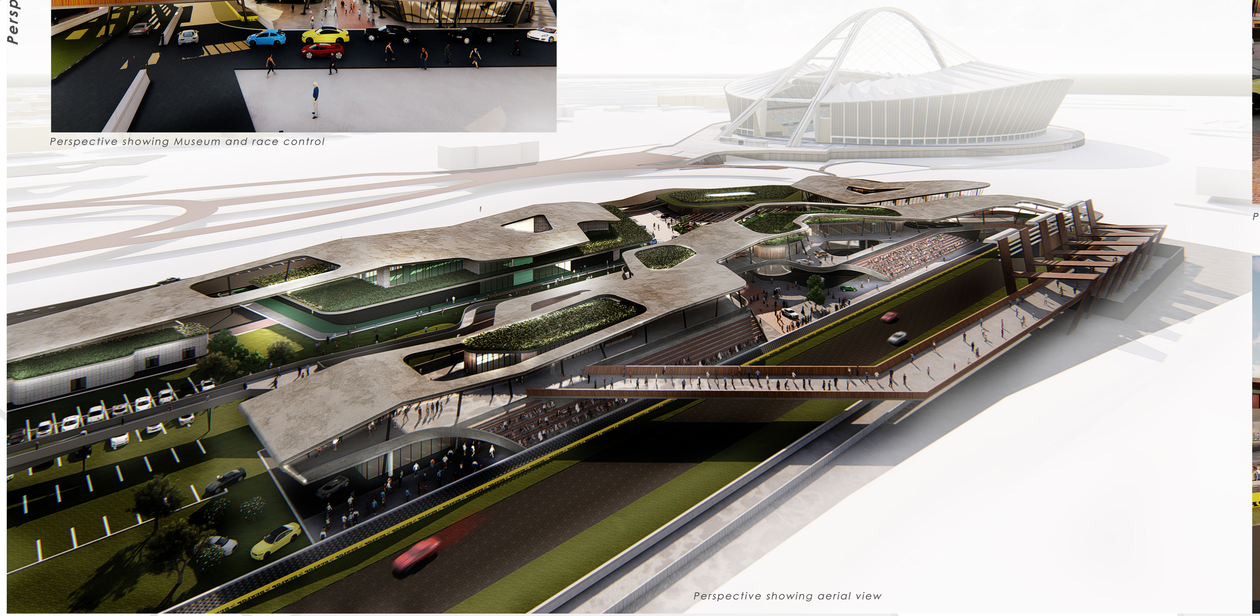
East Elevation
Scale 1 : 200



Section A-A
Scale 1 : 200

Section B-B
Scale 1 : 200

Perspective showing Museum and race control



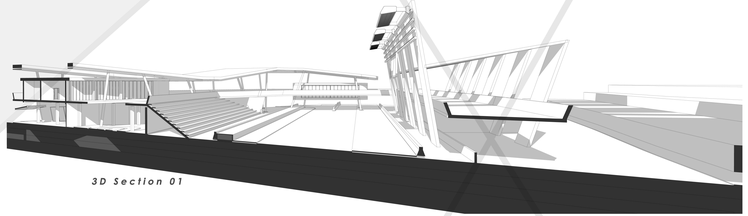
Perspective showing aerial view

Perspective showing primary courtyard

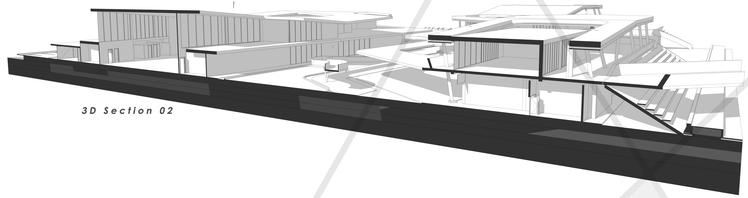
Perspective showing aerial view of parking

Perspective showing South view of South stands

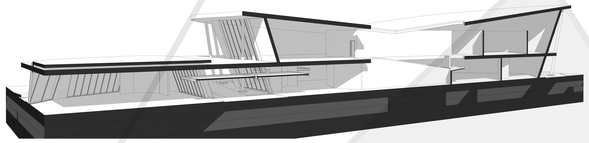
Perspective showing South view of North stands



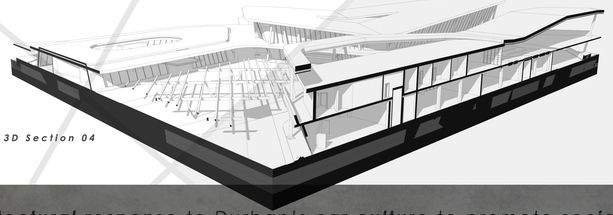
3D Section 01



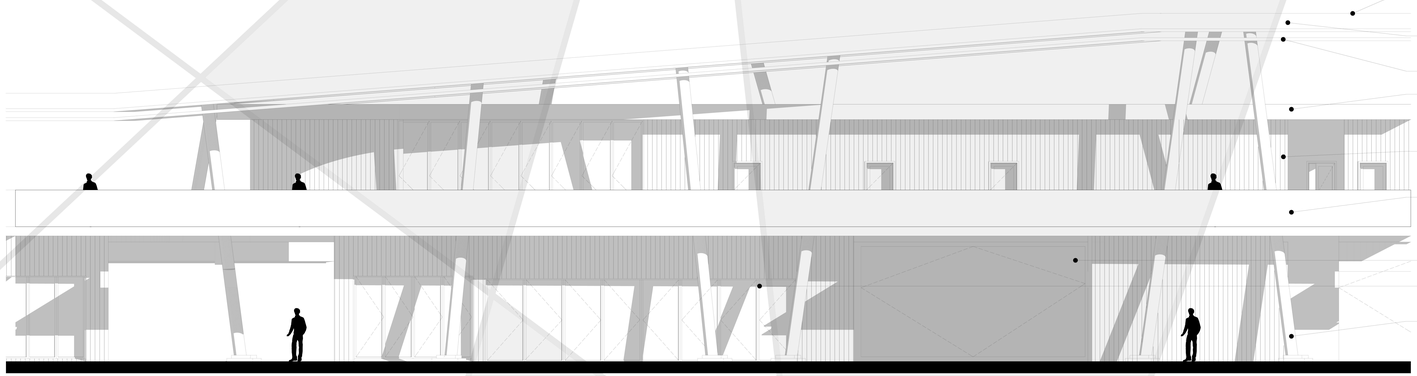
3D Section 02



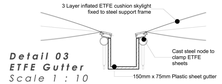
3D Section 03



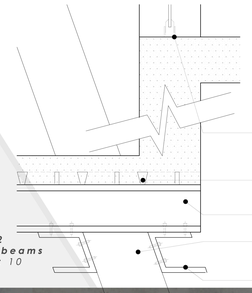
3D Section 04



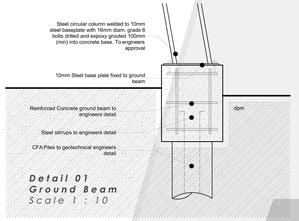
Section F-F
Scale 1 : 50



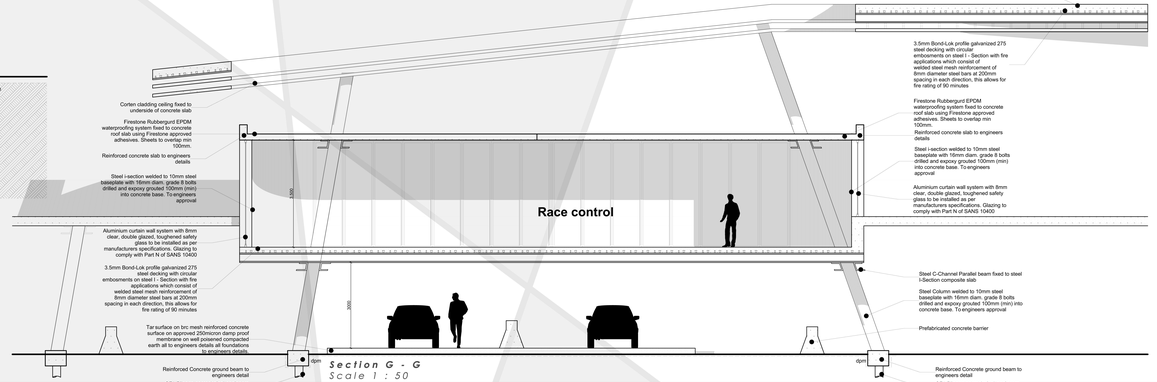
Detail 03
ETFE Gutter
Scale 1 : 10



Detail 02
Parallel beams
Scale 1 : 10



Detail 01
Ground Beam
Scale 1 : 10



Section G - G
Scale 1 : 50