CLEMSON UNIVERSITY INTERNATIONAL CENTER
FOR AUTOMOTIVE RESEARCH

Architectural Guidelines - Overview

The following document is intended to serve as a guideline for the development for the
new Campus of the Clemson University International Center for Automotive Research
(also referred to as "Clemson University ICAR") to be initiated in Greenville, South
Carolina. These guidelines have been developed to facilitate the development process
and encourage creative development and design.

In order to assist in the development of this Campus, these principles, guidelines and
standards should assist future development teams in understanding the underlying
issues that should be addressed in the public/private portions of the Campus.

It is the intent of senior administration at Clemson to achieve a philosophical
consistency to their Campuses. Therefore, the committee was asked to utilize the Main
Campus guidelines as a template for the Clemson University ICAR Campus in order to
achieve the desired consistency. These Main Campus guidelines were prepared as part
of the Clemson University Campus Master Plan 2002, and prepared by a team of
planners led by Dober, Lidsky, Craig and Associates, Inc. of Cambridge, Massachusetts.

The attached document was prepared to parallel the philosophies of the Main Campus
as much as possible in order to achieve the requested consistencies between the two
Campuses.
Table of Contents

Architectural Guidelines - Vision

Design Principles

*Promote Intellectual and Social Interaction*
Purpose
Outdoor Space
Indoor Space
Pedestrian Campus

*Respect Cultural and Historic Resources*
History and Culture
New and Old
Rural and Urban
Intended Aesthetic

*Value Sustainable Design*
Life and Living
Past, Present and Future
Stewardship

Design Guidelines

Introduction
Landscape
Landform and Elements
Landscape Character and Trees
Trees and Space
Trees and Development
Trees and More Trees
Landscape Character and Open Space
Space and Development
Space and Associations
Space and Infill
Space and Well-Being
Plant Life and Well-Being
Plant Life and Scale
Circulation
Car Circulation and Entry
Approach, Entry and Threshold
Car Parks and Structures
Pedestrian Circulation
Walking and Beauty
Walking, Campus Fabric and Interaction
Walkways and Courts
Walkways and Gardens
Walkways and Safety
Signage
Outdoor Signs
Campus Architectural Style
Architecture
A Pragmatic Architecture
Commodity – Utility
Campus Architecture and User Needs
Campus Architecture and Sustainability
Firmness – Durability
Architecture at a Scientific Institution
Measuring Firmness
Delight – Beauty
The Means to Delight in Architecture
Architecture and the Individual
Honest Architecture
Relationship of Architecture to the Natural Environment
Public Art
Landscape, Art, Buildings
Art and Interaction
The Place of Art
Art and Memorials

Planning Standards

Introduction
Site Development Goals
Open Spaces
Bikeways
Pedestrian Walkways
Transit

Campus Standards

Campus Standards for Buildings and Structures
Campus Standards for Site Development
Campus Standards for Landscaping
Architectural Guidelines - Vision

Prior to initiating the conceptual planning process for the new Clemson University ICAR Campus, Dr. James F. Barker, FAIA outlined the overlying guiding principles to be followed in the development of the Campus.

These principles are listed as follows:

- Develop a Sustainable Environment
- Follow the existing Clemson Campus Model

Principles to **FOLLOW** based on the existing Campus model:

- Overall Density
- Landscape character
- Rolling hills, contours, topography
- Creation of Outdoor Rooms
- Priority of People first rather than cars
- "A Sense of Place"
- A destination
- From I-85 see people and activity
- Encourage Interaction - exterior and interior
- "Cluster" – Collaboration
  - Connectivity - intellectually and recreationally
  - Garden atmosphere
  - Entry/Middle/Center Edge
  - Vitality 24 hours/day, 7 days/week
  - A Campus / not a Research Park
  - International Image and Substance
  - Commuter focus, not residential
  - Integration of High Performance with Consumer Research

Principles to **IMPROVE**:

- Infrastructure
- Consistency of Architectural Image
- Separation of Service/Trucks/Waste
- Parking density - up rather than out

All landscape and facility development on the Clemson University ICAR Campus will satisfy the design criteria that were originally stated by Marcus Vitruvius Pollio in his *De architectura* written in the first century BC. In Sir Henry Wotton's 1624 rendition of Vitruvius’s maxim, the first of these criteria is commodity or utility, the second is firmness or durability, and the third is delight or beauty. The University's overarching Design Principles should be applied through the execution of projects that exhibit these qualities.
Design Principles

Promote Intellectual & Social Interaction

Purpose

The purpose of the Clemson University ICAR Campus, as the physical manifestation of the idea of a university, is to bring together a diverse group of people by providing settings that foster learning, creativity, collegiality, and intellectual growth – consistent with the charge if its founder, Thomas Green Clemson, that Clemson be “a high seminary of learning”. The principle of promoting interaction extends beyond the development of appropriate classrooms, courtyards, or quads, to the purposeful creation of many different types of spaces strategically planned, placed, and furnished to encourage informal dialogue in teacher-to-teacher, student-to-teacher, and student-to-student situations. There are three major Campus components the principle applies to – outdoor space and indoor space woven together by a pedestrian Campus – each of which has a distinct role.

Outdoor Space

Open space should support a sense of community, by providing many types and sizes of outdoor meeting and recreation areas. In addition, open space should be designed and maintained to unify the Campus by connecting diverse site and building elements together as an attractive whole. Further, each outdoor space, large or small, should be seen as a garden to cultivate the minds of the Campus users.

Indoor Space

Where outdoor space is common to all Campus constituents, individuals occupy indoor space. The building walls mitigate between the two environments. In buildings, opportunities for the exchange of ideas should also be maximized. As with outdoor space, many types and sizes of indoor meeting spaces should be provided for both planned and unplanned interaction. The amount of public space in buildings should be sufficiently generous to allow for this interaction to occur.

Pedestrian Campus

Fundamental to the idea of social interaction is the notion of a pedestrian Campus. Only when people are outside of their cars do they have an opportunity to engage in the Campus environment and community in a meaningful way. Through its design, the Campus should encourage the individual to walk from place to place, experiencing things such as art and artifacts, and engaging in conversations with people along the way.
Respect Cultural & Historic Resources

History and Culture

In order to meet Thomas Green Clemson's charge to be a "high seminary of learning", Clemson University has been a science and service oriented institution. The culture that has evolved from this pragmatic worldview is one that cultivates talents in a wide range of disciplines. These traditional values and beliefs contribute to Clemson's sense of place and should be applied to Clemson University ICAR.

New and Old

Campus architecture and landscapes communicate something important about the issues and priorities of the present generation. New buildings, modifications to existing facilities, and even minor changes to a Campus will respect the legacy that will be left to future generations. The quality of the built environment is key to the distinctiveness, long-term viability, and image of the University.

Rural and Urban

Significantly, another cultural resource is the Campus, considered as a whole. The Campus is a representation of the past and the future, the rural and the urban. These contrasting qualities will be used to contribute to the unity of the Campus.

Intended Aesthetic

Despite the mix of past and future, rural and urban that exists on the Main Campus, Clemson University ICAR should maintain an intended aesthetic in an on-going effort to preserve continuity and enhance coherence and relevance. At Clemson University ICAR, these seemingly opposite characteristics should bring life and excitement to the Campus. Clemson University and other participants will protect and enhance this unity while allowing for diversity, developing a reasoned consistency within districts, and encouraging creativity for a single project.

Value Sustainable Design

Life and Living

The responsible use of all forms of energy and the good health of the community are high priorities of Clemson University ICAR. Energy consumption and the "ecological footprint" of the Clemson University ICAR Campus will be reduced while the productivity and health of the community will be improved. Balanced with other priorities, sustainable principles that promote these objectives will be incorporated into all building and infrastructure projects to the fullest extent possible in an effort to create environmentally responsive facilities.
Past, Present and Future

Clemson University is an institution entrusted to the present generation. The natural and built environments of the Campus and other properties should be cared for, developed and administered in such a way that they are protected, utilized appropriately, and positively changed for future generations. Through all efforts, vigilance will be applied to ensure that planning, design and construction are targeting efficient use of resources, and that careful and responsible actions are taken to ensure that resources are utilized in the best possible way while achieving the other primary principles of design.

Stewardship

Stewardship is the concept of responsibly managing all resources for the benefit of present and future generations of people, plants and animals. Objectives in the stewardship of resources will include such goals as:

Manage resources in a manner that is fiscally responsible.

Manage resources in a manner that is compliant with the rules and regulations established by society.

Manage resources in a manner that provides the facilities necessary for Clemson University ICAR to perform its missions of education, research and service in order to better society.

Design Guidelines

Introduction

The Design Principles – based on interaction, culture and history, and sustainability – provide a working framework to guide the development of the Clemson University ICAR Campus. The Design Guidelines provide planning and design guidance for all landscape and building projects. The primary audiences are those involved in the planning and design of such projects that include university user groups and design consultants to Clemson University ICAR.

These guidelines apply a philosophy that does not intend to be so constraining as to inhibit creativity. Rather the opposite, their intention is to provide design parameters in which creativity can flourish and still maintain overall Campus planning objectives that reflect both broad philosophic principles and specific standards.

Landscape

Across the United States and around the world the mention of South Carolina stimulates images of the southern landscape.
Landform and Elements

The land selected for the Clemson University ICAR Campus, a rolling, hilly topography, plays a vital role in creating interest. The buildings themselves should be very handsome structures. The buildings also will perform the valuable function of creating meaningful open space by their form and siting. Some elements of the landscape such as plazas, fountains and public art will contribute to this beauty. The arrangement of elements on the land will add to the overall aesthetic quality by creating vistas, framing views, or providing visual termini.

Landscape Character and Trees

New trees will be planted on a regular basis and significant existing trees and quality woodland will be protected as important natural and cultural resources. Efforts will be made through planning, design, construction, and maintenance processes to ensure that these trees are protected and remain a viable, valuable part of the Clemson University ICAR Campus. These efforts will include the designation for preservation of mature hardwoods.

Trees and Space

The most important resource that contributes to the beauty of a Campus setting are large, grand trees. The Campus will consist of a series of spaces that connect buildings and knit together often-diverse functions. Some of these spaces will have the character of a garden. However, the common thread that will run through the new landscape is the ubiquitous presence of trees. The tree canopy is the single defining element that will make the Clemson University ICAR Campus memorable and beautiful. The trees will shape and reinforce the Campus character.

Trees and Development

As development on the Campus matures, compaction of the root zone and loss of structural roots may place more pressure on existing trees. For this reason, the planners of projects should carefully consider the impact on existing trees, and the enhancement of the project through the planting of new trees.

Trees and More Trees

As older trees become less viable and are lost to disease or other causes, there will be a very active tree maintenance and replacement program. The care and protection of trees will be a very high priority for the University. The preservation, protection, and ongoing health of existing trees will never be made a second priority. In addition, the replacement of trees that are either removed or near the end of their life span will be an ongoing program.
Landscape Character & Open Space

Although the center of the Campus will increase in density, the dedicated open space of the Campus will be protected from development and will be preserved or enhanced as appropriate.

Space & Development

Open space preservation is a very important component of any responsible development or land use strategy. Depending on scale, open space provides several benefits, which may include enhanced water and air quality, improved habitat, decreased storm water run-off and the desirable aesthetics of natural surroundings.

Space and Associations

There are many areas of landscape that are not readily associated with a particular building or function. These are general open spaces that, in fact, may be the most important landscapes on the Campus. These are the areas that weave the fabric of a Campus together, making it a memorable place. These are the areas that are essential to setting the Campus comfortably into its environs. These spaces have great value and should be carefully planned.

Space and Infill

Ironically, these are the areas that are usually under the most pressure of becoming future building sites. As the Campus grows, it could either take up additional land by spreading out and expanding or by seeking areas within the core that can be filled in by new structures. Open space needs to be protected from haphazard infringement and degradation and a balance between expansion and in-fill should be achieved.

Space and Well-Being

Planned open space corridors are vital to the health, function and beauty of the environment. As an example, on the Main Campus the area known as the Campus Green, the area which links Bowman Field to the Madren Center is vitally important to the physical organization of the Campus and is essential in maintaining the character of the Campus landscape.

Plant Life and Well-Being

The appropriate use of vegetation in the built environment is a major influence on the quality of human life. Shrubs, herbaceous plant material, and trees filter pollutants in the air and water, mitigate wind and solar heat gain, stabilize soil to prevent or reduce erosion, and provide an aesthetic counterpoint to the built environment. These attributes are essential to balancing the effects of humans on the land. Furthermore,
the native plants of a region provide some of the strongest clues to the unique identity of a place. In turn the creation of a healthy growing environment for the plants requires the collaboration of arborists, horticulturists, landscape architects, and native plant biologists.

*Plant Life and Scale*

The various landscapes are important in maintaining the human scale of the Campus. Planting design will be within the concept of reasoned consistency and will reflect the nature of the place, the requirements of maintenance, and the intended aesthetic of the Campus. Plantings will always be designed in the context of the greater Campus. Continuity in plant selection and arrangement is integral to unifying the Campus landscape.

*Circulation*

The image of the Campus depends on legibility and clarity from multiple vantage points in motion, at various speeds. The range is from a walking pace of three miles per hour to a driving rate of thirty-five miles per hour. The pedestrian and vehicular systems will be designed to reflect this.

*Car Circulation and Entry*

All planning and design for facilities near the periphery of Campus will consider the impact of the project on the Campus gateways. The Campus road system will provide for the safe and efficient movement and parking of automobiles, and, at the same time, promote the pedestrian nature of the place.

*Approach, Entry and Threshold*

The approaches to the Campus are very important in that they set the tone for what is expected and indicate points of orientation for the visitor. The approaches and entrances will be gateways, not necessarily in the literal sense, but definitely in the figurative sense. There will be no ambiguity as to when one enters the Clemson University ICAR Campus.

*Car Parks and Structures*

Due to the Clemson University ICAR Campus being principally a commuter campus, parking areas and structures will need to be carefully placed in order to allow convenient access to the buildings; but also, minimizing pedestrian/vehicular conflicts, and visibility from major roadways.
Pedestrian Circulation

Pedestrians' needs are of the highest priority and take precedence over the demands of the motorist. All planning, design and development will support this priority while meeting the basic needs of emergency service, maintenance services, disabled individuals, and mass transit.

Walking & Beauty

The Clemson University ICAR Campus will be beautiful and enjoyable to walk. The topography of the Campus provides interest and the many large trees provide shaded walks throughout much of the area. Adding further to the experience will be the diversity of walkways, ranging from sidewalks on busy streets to garden paths. Walking also promotes physical well-being and, with adequate lighting and safety measures, can be pleasurable both day and night.

Walking, Campus Fabric, and Interaction

The pedestrian circulation systems will link the various facilities and open spaces together into a cohesive fabric for the Campus community. It is also where meaningful interaction between members of the Clemson University ICAR community will occur. The essential components of the pedestrian circulation system will consist of major walkways, minor walkways and plazas. The major walks within the pedestrian circulation systems will comprise the mainstream of Campus pedestrian traffic. These walks will afford the most direct line to the major buildings and building groups. Secondary to the major walks will be the system of minor walks, which serves each building on the Campus. Minor walks will be scaled to the function and character of the buildings they serve and to the open spaces they traverse.

Walkways and Courts

The plaza, as a defined space, is an opening or gathering place and special feature in the circulation system. It is an essential element in providing focus and meeting opportunities on longer walkways and a means for collecting and distributing pedestrians.

Walkways and Gardens

If we are to think of the Campus as a garden, then these pedestrian sidewalks are the garden paths. They will be places of beauty, and elements of visual interest, such as specimen plantings or sculpture, will be found along the way. Also, there will be numerous opportunities to stop and sit along the paths. If the Clemson University ICAR Campus is to become a truly pedestrian-friendly environment, then the pedestrian areas must be comfortable, functional, and beautiful.
Walkways and Safety

Vehicular circulation will be clearly discernable, in terms of the hierarchy of various streets and drives, as well as being safe and attractive. Care will be taken to minimize possible conflicts between automobiles and pedestrians using well-marked crosswalks and curb ramps at all intersections. Also, transit stops will be safe and conveniently located.

Signage

The clarity of Clemson University ICAR’s image will be enhanced by both the outdoor and indoor signage systems. The public’s impression of the University is a reflection of the quality of design, coherency, and consistency of these important systems.

Outdoor Signs

The information system on a Campus reflects the image of the institution. The design, readability and consistent placement of signage on the Clemson University ICAR Campus are necessary factors that help people find where they need to go in an efficient and pleasant way and thus create a positive image of the Campus.

Campus Architectural Style

The architecture for the Clemson University ICAR Campus will be “International Style”.

The idea that architecture was too decorated became synonymous with Mies van de Rohe’s dictum, "Less is more". The International Style sprang from the seed of the American Corporate image. This architecture was soon to be equated with Corporate America. The idea that the style implied a choice was a notion that would stand in the way of an architecture, which sought out the pure truth about the material and forms, which it employed.

International Style, in architecture, the phrase of modern movement emerged in Europe and the United States during the 1920’s. The term was first used in connection with a 1932 architectural exhibition held at the Museum of Modern Art in New York City. Architects working in the International Style gave new emphasis to the expression of structure, the lighting of mass, and the enclosure of dynamic spaces.

The ideology for the International Style of architecture celebrates technology, modernist, anti-historicist, anti-ornament, functionalist and exclusivist.

The chief characteristics of the International Style are smooth untextured surfaces, asymmetrical composition, solid plane, rounded corners, flat roofs, large glass bands and metal panels. Horizontality was also a characteristic, particularly on commercial buildings where alternate bands of glass and metal panels created a solid plane and horizontal effect. Also, the style emphasizes a lack of color, contrasting black and white.
“Technology is far more than a method, it is a world in itself. As a method it is superior in almost every respect...whenever technology reaches its full fulfillment, it transcends into architecture. It is true that architecture depends on facts, but its real field of activity is in the realm of significance.”
~ Mies van der Rohe

Architecture

Architecture is the background to purposeful and beautiful outdoor space as well as the background to the surrounding landform and landscape. As the container of space, architecture should be useful and flexible and appropriately accommodate the assigned learning, living, and teaching activities that occur within. At the same time, architecture should instill in its users a high sense of pleasure.

A Pragmatic Architecture

Campus architecture will reflect the pragmatic culture of the Clemson University ICAR Campus.

Clemson University was established as a scientific institution for the purpose of serving the region with the development of useful solutions to its most critical needs. This scientific, service-oriented purpose has given rise to a pragmatic Clemson culture; and consequently to the expectation of architecture that is both practical and sincere, demonstrating commodity, firmness and delight. This culture will be reflected in the architectural styles seen on the Clemson University ICAR Campus.

Commodity – Utility

Campus architecture will be designed and maintained to advance the design principle promoting social and intellectual interaction.

Campus Architecture and Interaction

At Clemson University ICAR, part of a building’s purpose is to create an environment that promotes intellectual and social interaction. Buildings may provide informal learning spaces that encourage interaction among users. If possible, these spaces should be located near high traffic areas such as lobbies; toilets; stairs; elevators; copying and vending areas. If feasible, buildings should provide corridors wide enough for people to stand and talk comfortably without interrupting normal pedestrian circulation; stairs spacious enough to encourage conversation; kitchenettes adjacent to assembly areas; and furnishings designed and arranged to promote discussion.
Campus Architecture and User Needs

Another of the purposes of architecture at Clemson University ICAR is to accomplish specific practical objectives. Buildings will be composed of spaces that are sized and arranged from a thoughtfully considered space plan, in turn based on a thorough analysis of user requirements. Each building will provide for the physical and psychological needs of its users so that the fundamental purposes for occupying the building are maximized. This includes such provisions as appropriate for thermal comfort, indoor air quality, and access to daylight and views that support the productivity, health and performance of building occupants. In addition, because programs change over time, buildings must be flexible.

Campus Architecture and Sustainability

Campus architecture will be consistent with Clemson University's commitment to optimize energy usage, protect air and water resources of the general environment, and conserve materials and resources associated with the construction of buildings. The Leadership in Energy and Environmental Design (LEED™) system is but one example of the type of standards that the University will consider for sustainable design.

Firmness -- Durability

Buildings will be solid, stable and strong -- both physically and visually -- yet allow for flexibility and change.

Architecture at a Scientific Institution

In every aspect, architecture is held in check by the laws of physical science. All architecture components are subject to the laws of statics and dynamics. In a scientific institution, these components must have successfully passed the tests of scientific experimentation. The architecture of a scientific campus should include materials that are the logical expression of material properties and laws. The systems and materials will be durable -- having demonstrated longevity and permanence -- and consequently capable of creating a secure sense of place for campus inhabitants.

Measuring Firmness

Firmness necessitates that buildings and their components, when put in use, will endure without significant failure over the long term. The primary tool for measuring firmness is life cycle costing -- an economic assessment of competing design alternatives, considering all significant costs of ownership over the economic life of each alternative. To be most effective, the structural frame will be designed to allow for changes in space configurations and adaptations of systems over time.
Delight – Beauty

Campus architecture will be beautiful and provide delight.

The Means to Delight in Architecture

The buildings of the University will be beautiful and provide delight. This delight may be derived from successfully achieving “utility”. A pragmatic worldview associates beauty with utility. If a building successfully fulfills the principles and other design guidelines of the University, in a certain sense, it will be beautiful. In addition, a building may provide delight because it successfully embodies “firmness”. Or, the means of providing delight may be independent of both “utility” and “firmness”. Nevertheless, architecture should provide intellectual and spiritual satisfaction; it should provide pleasure; it must provide delight.

Architecture and the Individual

University buildings should be concerned with the welfare and dignity of each individual in the Clemson University ICAR community. The buildings will be pleasant for both their users and for those on Campus that experience them only from the outside. Buildings will be welcoming, with clearly defined entrances, and achieve a symbiotic relationship between the indoors and the natural environment outdoors. Building exteriors will be pedestrian-friendly and scaled and related to the size of the human form.

Honest Architecture

The architecture will be reflective of the building’s use, integrating the interior and exterior for a unified building design.

Relationship of Architecture to the Natural Environment

Buildings will engage with the adjacent natural environment; capturing outdoor views for building occupants from regularly occupied areas such as classrooms, laboratories and offices. As much as practical, plan buildings to bring the natural environment into the building interior. Each building will be visually compatible with other buildings in its immediate context and with the Campus as a whole.

Public Art

The presence of art, in all forms, on the Campus is an extension of Clemson University’s values. Beauty is found not only in the creation of practical knowledge and tools for the betterment of humanity, it is also found in art which stimulates and provokes an intellectual or emotive response in the viewer. Developers should be encouraged to consider public art on their property.
Landscape, Art, Buildings

Public art will be a very important ingredient in the campus landscape of the Clemson University ICAR Campus. It is, indeed, essential to creating a campus that contributes to the educational process and to the intellectual and emotional enlightenment and development of its constituents. Exposure to art and appreciation of art is essential to the development of well rounded, educated individuals.

Art and Interaction

Public art and monuments promote social gathering and interaction and significantly contribute to place making. The piece of art itself automatically becomes an identifiable point, a landmark, in the campus environment and often becomes a place of gathering, identification, and orientation. Public art can reflect the history or culture of the place and serve as an intellectual and emotional stimulus. Art in the Campus setting exists mainly for the sake of the Campus community, providing another level of meaning in the landscape.

The Place of Art

Because of its importance in the life of the community, art should be thoughtfully executed and placed. Placement of each artwork or memorial should relate the work to its immediate surroundings, its context within the campus. Public art should not be placed where it impedes pedestrian movement. Public art should be vandal resistant and not require on-going, significant maintenance needs.

Art and Memorials

The greatest care should be taken in the design of public memorials — sculptures, buildings, fountains, or other forms of commemoration. Unlike most of our built environment, commemorative works are kept in the public trust in perpetuity. Thus, their siting, design, and quality of materials should be given extremely careful consideration.

Planning Standards

Introduction

The purpose of the Planning Standards is to provide information that will inform and guide the planning of facilities on the Clemson University ICAR Campus. This information will be used predominantly in the pre-design phase of the potential project. It will be used in evaluating potential sites for buildings, massing constraints, access, and impacts on parking. Parties involved in these planning efforts will use this information as a guide in the early planning stages.
Site Development Goals

The guiding principles set forth by President Barker have been incorporated into the Planning Standards and the Campus Standards for the Clemson University ICAR Campus. The pedestrian nature of the Main Campus will be followed in the development of the Clemson University ICAR Campus. Outreach to the community should be reinforced. This may be realized by making the Campus inviting and visitor access easy. Attractive landscaping and signage should further enhance the Campus. Sites for new buildings on the Campus will be carefully planned. When a new facility is designed, the building site should be selected to fit within the broad Campus design parameters.

Open Spaces

Dedicated open space (i.e. percentage of each building site designated for landscaping improvement) will be protected from all types of development. Open space areas that are environmentally sensitive, such as major drainage-ways, should also be protected from impact of development by vegetative buffers. Buffers along streams or creeks will be a minimum of 35 feet from the top of the bank. These buffers will be left natural where significant vegetation exists or planted with indigenous plant material to help prevent erosion.

Bikeways

Where dedicated bicycle paths are provided they will be designed with due consideration of safety issues, speed, sight lines, stopping distances, curve radii, intersection design, surfacing, and protection from hazards. The width and the clear height of bikeways must comply with Applicable Codes.

Pedestrian Walkways

The minimum width of pedestrian walkways within the Campus will be five (5'-0") feet.

Transit

Greenville County and the City of Greenville have indicated that Bus service should be available to the site. Also, there exists on site an abandoned rail line, which ultimately could become light commuter rail. Every effort will be made to plan for light commuter rail service in the future.
Campus Standards

Campus Standards serve to insure a sense of overall continuity and harmony, while still encouraging variety and expression within the overall campus. The following standards are meant to insure that there be a consistency to the Clemson University ICAR campus. These standards will serve as the guidelines and development requirements to be employed and enforced by the two (2) Design Review Committees for the Clemson University ICAR Campus in reviewing applications submitted by owners and developers pursuant to procedures established in the Declaration of Covenant, Conditions and Restrictions for the Campus.

Campus Standards for Buildings and Structures

The campus standards for buildings and structures will have a significant impact on the character and image of Clemson University ICAR. The following standards provide the overall framework for architects and engineers to create buildings and other structures, which will enhance the man-made environment without detracting from the unique natural qualities of this setting.

Building Uses

Building uses shall conform to requirements of the Code of Ordinances, City of Greenville, South Carolina, including the Zoning Chapter, and to all other applicable laws, ordinances, and regulations (hereinafter referred to as “Applicable Codes”). Building uses shall also conform to the applicable provisions of the Declaration of Covenants, Conditions and Restrictions for the Clemson University International Center for Automotive Research, recorded in the Office of the Register of Deeds of Greenville County, South Carolina. Because the Code of Ordinances, including the Zoning Chapter, requests for variances or adjustments from the requirements of the Code of Ordinances must be presented to the appropriate DRC, and approved by that Committee, before being submitted to the City of Greenville or the agency designated by the City of Greenville to process such applications.

Building Heights

Buildings heights shall be in accordance with Applicable Codes.

Building Siting and Setbacks

The siting of building shall be in accordance with the building setback and other requirements of Applicable Codes.

Buildings should be sited in a way that maximizes the opportunities for both building occupants and on-site pedestrians to view adjacent land and gardens.
Exterior Walls and Facades

The use of durable, long-lasting, low-maintenance materials is required for all exterior walls.

Large exterior wall surfaces should be broken up using vertical and/or horizontal articulation.

Accent colors may be used to highlight special architectural features, but the colors and the extent of coverage must be approved by the applicable DRC.

Exterior glass may be tinted for heat reduction but may not be reflective.

Roofs and Roof Surfaces (Excluding Parking Structures)

Flashing, sheet metal, vents and pipes shall be finished to match or complement adjacent roof and building surfaces or screened from view.

Mechanical equipment may be placed on the roofs so long as they are screened from view by perimeter walls or designed to be an integral part of the building massing which often occurs in the International Style of Architecture.

Parking structures must also comply with all requirements of the Applicable Codes, including landscaping requirements where applicable.

Parking Structures

Parking structures shall be compatible in design materials and colors with the buildings they are to serve.

Except where inconsistent with the architectural design of the building supported by a parking structure, landscaping will be incorporated into the design of parking structures. This may be accomplished through the integration of planters into the design of exterior wall openings, the incorporation of wall vine trellises into all vertical exterior members, or the placement of trees at the height and breadth to ultimately screen at least 50% of the exterior elevations, planted no farther than the normal reach of the tree's branches from the face of the structure.

Campus Standards for Site Development

Campus standards for site development are intended to minimize the impacts of development on areas not occupied by buildings and other major structures. They provide for consistency and compatibility in the design of vehicular and pedestrian circulation systems, parking, site grading, signage, drainage, visual screening, outdoor lighting and utilities. These Campus standards will serve as the guidelines and development requirements to be utilized and enforced by the Design Review Committees ("DRC's") for the two segments of the Clemson University ICAR Campus in Greenville 56440 v 7
reviewing applications submitted by owners and developers pursuant to the procedures established in the Declaration of Covenants, Conditions and Restrictions for the Campus ("CCRs").

**Grading and Drainage**

Wherever possible, earthwork volumes should balance within a development parcel and grading should not adversely affect adjacent existing development or terrain. All on and off-site grading activities shall conform to Applicable Codes.

Slopes should not exceed 2 to 1 where planted with ground cover and 3 to 1 where planted with grass.

Surface runoff shall be retained and detained on site in accordance with the most recent drainage regulations. Retention/detention basins shall be designed to have a natural appearance rather than a man-made geometric form. They should be landscaped in accordance with the Campus Standards for Landscaping set forth herein, or hidden in the surrounding landscape. The use of crushed "Rip-Rap" should be avoided.

Drainage from large impervious surfaces (parking lots, plaza and walkways) should be allowed to sheet-flow into planted areas to maximize potential ground absorption rather than channeling the runoff into drainage ways.

For parking lots, which are used only for overflow parking or special events, the surfaces should be pervious, such as "grass-crete" or blocks with spacers, so as to allow water to drain directly into the subsoil.

**Dedicated Roadways**

All dedicated roadways must be designed and constructed in accordance with Applicable Codes, including regulations, requirements, and specifications required by the South Carolina Department of Transportation.

If a Property Owner supplements landscaping within a dedicated right of way, the types, sizes and spacing of all trees and other landscaping planted shall be consistent with the types of landscaping planted by the City of Greenville or other public authorities within the dedicated rights of way.

**Non-Dedicated Roadways**

Internal roadways, including arterial roadways, collector roadways, and distributor roadways, shall comply with all requirements of the Applicable Codes. Interior roadways will be tree-lined and landscaped.
Walkways and Bikeways

All pedestrian walkways between buildings and roads shall be constructed of the same material (concrete, brick or concrete pavers). Asphalt walkways shall not be permitted except as approved by the appropriate DRC. Nature trails shall be constructed from materials which are more forgiving or even a softer surface depending on the conditions.

Where pedestrian walkways cross any roadways, the crossing shall be highlighted through the use of one or more of the following techniques: special paving materials or road striping.

Bikeways will be aligned with roadways and walkways. Bikeways shall be constructed of the same materials as the roadway or walkway to which they are adjacent.

Bike racks shall be provided near at least one major entrance to all occupied structures, building complexes and outdoor recreational facilities.

Surface Parking

All surface parking areas must comply with Applicable Codes, including minimum requirement for onsite parking stalls and landscaping.

Whenever possible, parking aisles should be perpendicular to the building entry facades so that patrons do not need to walk between vehicles.

Utilities

All utilities including power and communication lines, sewer, water and irrigation pipes shall be placed underground.

Necessary ground level utility equipment (meters, check valves, transformers, substations, etc.) and mechanical equipment for buildings shall be screened by landscaping buffers, fences and/or walls which are compatible with adjacent structures and landscaping and which are in compliance with the Guidelines for Landscaping set forth herein.

Walls and Fences

Walls (other than retaining walls) should only be used to provide visual screening, security, privacy and/or sound attenuation.

Solid perimeter walls (within 20 feet of any property line) shall not exceed 3'-6' in height unless needed to screen some unsightly equipment or use.

The materials, colors and design of all walls must be similar or compatible with adjacent structures.
Trash Areas and Service Yards

A wall, landscaped buffer, or berm (or combination thereof) at least 5 feet high shall be required around all trash collection or service areas as seen from adjacent streets, buildings or publicly accessible spaces.

Signage

An overall signage plan shall be submitted for each development project for review by the appropriate DRC. All signs shall follow the requirements set forth in the Applicable Codes. All signs shall be consistent and compatible with signage plans previously approved and constructed in other areas of the Campus.

Ground signs and entry features to major development complexes must be compatible with the design, colors and materials contained in the developments' buildings and landscaping. These signs/features may contain logos or insignias of the major users or tenants and should be located so as to clearly identify the development entry. No portion of the sign or feature should be higher than 5 feet above the surround grade (excluding berms) although a Campus entrance feature, a logo or other sculptural feature may exceed this height.

As a general requirement for light signs, all free-standing signs should be illuminated with concealed ground-level spot lights, all wall signs should be back-lighted, and all marquee signs should be illuminated from within. No light sources should be visible from either outside or inside the buildings, and no flashing lights shall be permitted. No neon tubing shall be directly visible.

Exterior Lighting

Except where safety and security are required, emphasis in lighting should be on a "mood-setting" effect rather than on intensity of illumination.

Light sources must be recessed, screened or shielded to minimize glare and reflection, and no lighting shall adversely affect any adjacent areas.

Low incandescent or tungsten halogen lights are preferred, and fluorescent, mercury vapor or other "cool white" light sources should not be used for exterior lighting.

Roadways, parking areas and pathways will be lighted with fixtures that are in keeping with the overall project design. In general, non-dedicated roadways should be illuminated by 25-foot high light poles, and pathways, steps and landings, by bollards, garden path lights and/or 10 to 12 foot high overhead lights.

Landscape lighting will be used to accentuate major trees (up-lights), decorative flower and shrub groupings and visual focal elements as long as the light sources are recessed or screened and not directly attached to the plant material.
Campus Standards for Landscaping

Landscape improvements, including the preservation of existing high quality trees, the creation of open spaces, and the planting of new materials, will be a primary focus of campus development plans to be reviewed by the DRC's. Each building site developer will submit a detailed landscape improvement plan to the appropriate DRC. The landscape improvement plan will clearly identify areas for each landscape cluster type described below, including the estimated coverage area for each landscape cluster type. The plan will also include estimated costs associated with landscape improvements. All landscape improvement plans must also comply with landscaping requirements of the Applicable Codes.

Landscape Improvements (Percentage)

Within each building site (i.e. a tract of land selected and designated by an owner or developer for the erection of a building or combination of buildings including parking, setbacks, retention, etc.), the area or areas designated for landscape improvements will comprise at least thirty percent (30%) of the total area of the building site.

Cluster Types

Described below are six (6) unique landscape cluster types. At least one component of each of the landscape cluster types described in Subsections (a) through (d) must be included in each building site. Where conditions are applicable, each site will also include cluster types described in Subsections (e) and (f). Set forth below is a description of each landscape cluster type:

(a) Park Landscaping. Each building site will incorporate an informal open lawn with meandering paths, clusters of trees, flowing streams (where available), one or more ponds, including retention/detention basins, and similar features. Clusters of trees may be included in Woodland, Garden or Buffer landscaping at the interface of architectural and park space, but the dominant imagery should be that of a pastoral landscape with broad lawns, large stately trees, and expansive vistas. Clusters of trees should be under-planted with turf when seating is desirable beneath the trees or by groundcovers where definition of pathways or integration with adjacent landscapes is desirable.

(b) Greenway Landscaping. Each building site will incorporate consistent landscaping located along streets, roadways, walkways and pedestrian corridors between other exterior spaces. This landscaping will be consistent throughout the open space framework. Trees in pedestrian greenways will reflect the character of adjacent landscaped areas.
(c) **Garden Landscaping.** Each building site will incorporate formal or informal decorative landscaping to be located adjacent to or near each building within the building site. These areas will include large clusters of plants, which have intrinsic interest, such as flowers, fragrance or ornamental foliage, or branching.

(d) **Plaza Landscaping.** Each building site will include a landscaped plaza, which is a hard-surfaced formal space where a variety of plants can be used to structure the space or give it texture, shade or visual interest. Plazas present a particularly important opportunity to make a memorable landscape impression; and for this reason, long-lived tree species are especially important for these spaces. A signature tree species is appropriate at each plaza.

(e) **Buffer Landscaping.** Each building site will include an appropriate number of buffer landscaping areas, which will serve to screen building service areas and unsightly areas; to separate incompatible uses; or to create a scenic backdrop. Because buffer landscaping will be used throughout the campus in a variety of conditions and for a number of different reasons, materials should be limited to a few species which reflect adjacent plantings. Ornamental trees in masses, mixed informal hedges, formal hedges, or rows of columnar or non-deciduous trees and shrubs will be used to create buffer landscaping in smaller areas. Woodland and Garden landscaping will be considered where sufficient space is available.

(f) **Woodland Landscaping.** On building sites which include an existing forest area, the landscape improvement plan must also incorporate an existing or designated forest area that has many layers of vegetation, including a tree canopy, a shrub layer, a groundcover, and (where available) one or more streams. One of the functions of the Woodland Landscaping on the campus is to provide a respite from the more urban or formal areas, which are characterized by other Landscape Cluster Types, such as Garden or Park. Woodlands also serve to improve the urban environment and provide pervious areas that aid in stormwater penetration. Woodland Landscaping may also be utilized as Buffer Landscaping. It may also be incorporated into parking lots or bio-retention areas.

**Landscape Improvements (Plans Submitted)**

Landscape improvement plans submitted to the applicable DRC must also address the following subjects:
(a) **Sedimentation and Erosion Control.** Aggressive erosion control measures should be built into any landscape design and installation. Again, an extensive use of mulch is recommended. Landscape designs will include positive management of surface water runoff to encourage recharge of ground water, such as the use of sub-surface perforated pipes connected to roof drains, drainage basins, and dry wells.

(b) **Irrigation Systems.** All landscape areas shall be irrigated using automatic irrigation systems with sub-surface piping. All work and materials will conform to Applicable Codes and to current industry standards.

(c) **Maintenance program.** Each building site proposal will include a clear and comprehensive set of landscape maintenance guidelines which must be approved prior to completion of the landscape installation. Landscape maintenance guidelines can help to establish and maintain campus standards, such as noise control, common hedge heights, uniform tree appearance by species and water conservation measures. As a minimum, the maintenance guidelines will address the following items:

- Recommended watering schedule
- Irrigation trouble shooting
- Recommended fertilization program
- Tree trimming schedule and guidelines
- Hedge and shrub trimming guidelines
- Acceptable hours of equipment operation (such as leaf blowers, lawn mowers and trimmers)
- Weed control measures
- Mowing schedule and equipment type (such as the use of mulching mowers)
- Green Waste disposal or utilization

The landscape maintenance guidelines will help to define a clear scope of work for landscape maintenance contractors or in-house maintenance personnel. It would allow for competitive "apples to apples" bidding of maintenance work, and will help to direct the maintenance program in fulfilling the design intent of the landscape architect.
Clemson University International Center for Automotive Research

Supplement to Architectural Guidelines

Building Exterior

Materials

In selecting exterior material for buildings within the Clemson University International Center for Automotive Research ("CU-ICAR"), designers should utilize the design vocabulary of the international style. When utilizing this style, which in some cases is minimalistic in its philosophy, it is critical that building exteriors, as viewed by pedestrians, appear humanistic in scale and warm and inviting. Therefore, as shown in the illustrated elevation which is attached as Illustration 1, the design philosophy will call for a base of rubble stone. The first one or two stories of a building, particularly at the entrances and in the pedestrian realm, should be warm precast or masonry. Above this first element of one or two stories, the exterior materials should be white architectural metal panels in order to enhance the international style.

Window Openings

As much as possible, window openings should be articulated in order to provide interest to the structures. This articulation can be achieved in a horizontal or vertical format. It can also be achieved with punched window openings.

Glass and Glazing

The creative use of glass and glazing will be highly desirable. Glass walls, mullions and fins are typically characteristic of the international style, as well as butt glazing. Within the public realm, which is customarily the sidewalk or main entrance to any structure, it would be preferable to use clear glass in order to achieve transparency into the building. This facilitates visual connectivity between the inside and the outside of the structures.

Glazing above the first floor may need to vary, since energy conservation will be a significant criterion in selecting the ideal glass and glazing system.

Sunscreens

The use of sunscreens, in an appropriate manner, is highly desirable. Sunscreens may be vertical or horizontal, but should directly reflect the orientation of the building. Sunscreens should not be utilized where they are not necessary and should not generate glare or significant heat gain or loss. It is recommended that the sunscreen structures should be made of metal, either steel with a white fluopolymer finish or natural aluminum.
Roofs

Roofs should be consistent with the international style. Flat roofs will be encouraged in most applications. Variety will be achieved by using varying height parapets, mechanical penthouses, vertical stacks, stairwells and similar features. In some instances metal slope roofs will be permitted in order to screen undesirable mechanical units or to create an interesting and unique architectural massing.

Color

The color scheme for the campus should be a blend of rubble stone, warm cut stone, precast or prairie stone masonry and white architectural metal panels with white metal mullions.

This pallet of materials should create an interesting mosaic within a highly landscaped and lush environment.

All metal objects on the site will be white in color, including the light standards.

Signage

All signage and signage plans must comply with the requirements of the sign ordinance(s) of the City of Greenville and the Declaration of Covenants, Conditions and Restrictions (CCR’s) for the Campus.

Each proposed project will work within the signage system in order to create a cohesive look to the overall campus. The general design intent for the campus signage system is illustrated on Illustration 2.

All signs will be white in color. White architectural metal will be utilized. The directional and identification signs shall range from eight (8) feet in height to five (5) feet and approximately six (6) inches deep. Lettering will be a combination of Helvetica medium and light with major entry signs being Clarendon letter style.

Corporate symbols/logos will be allowed on identification signs as approved by the appropriate DRC.

Lighting

Street lighting is intended to give a homogenous look. The standard for all streets and roads on the Campus has been previously established by the selection of fixtures installed along the main entrance boulevards and thoroughfares. Participants will be encouraged to use sustainable design in choosing the light fixtures for various properties.
Illustration 3 depicts three (3) examples which illustrate typical low, medium and high scale lighting.

Parking lot lighting should be creative. The use of hi-tech solar cell lighting will be encouraged.

Walkways should be lit in a humanistic way.

Accent lighting will be encouraged as up-lighting for landscape elements, sculptural elements, water features, etc.

Pedestrian plazas should be lit so that outside interaction may occur in the evenings in a safe and secure manner.

Multiple and sculptural lighting elements will be encouraged in plaza areas to generate interest and excitement.

All light standards and fixtures shall be white in color in order to give continuity with the international style. Light colors should be selected with the objective of giving a moon glow look to the campus rather than an artificial light color.

Walkways

The normal width of a campus pedestrian walkway will be five (5) feet. Where walkways need to be wider in order to accommodate pedestrian traffic or site accessories, they should adhere to the five (5) foot module, i.e., ten (10) feet, fifteen (15) feet, etc.

As the walkways proceed into the pedestrian precincts, the sidewalks will become more articulated as well as wider in overall dimension. The purpose for this will be to allow freedom of movement for multiple pedestrians in many directions. As the sidewalks proceed into the actual building areas, the materials will change from pure concrete to concrete with a specialty paving inset pattern. A plan view of a five (5) foot walkway module with specialty paving insets is shown as Illustration 4. This will also be true in the plazas.

Masonry will be the preferred material in order to inlay within the grid. Gradients should be maintained to meet ADA requirements as well as the City requirements for grade separations and slopes.

General site walkways that are in less formal areas should be meandering walkways which are at least five (5) feet wide. These walkways may weave into highly landscaped areas along creek beds, streams, or steep grades.

Edge treatment should be utilized in order to prevent breaking of edges.

Steps and ramps that intersect walkways utilizing specialty paving should also be made of specialty paving. Where concrete sidewalks intersect stairs and ramps, they should be
constructed of concrete. All site exterior handrails should be made of tubular steel rail with a white fluoropolymer finish coating.

Safety will be a major concern for walkways; therefore all walkways should be visible to the passerby. They should be well lit and landscaped in a manner which would avoid individuals hiding behind shrubbery. The goal will be to create a safe and secure campus.

Plazas

Plazas should be paved with materials similar to those used in the accented walkways (five (5) foot module concrete band with specialty paving) in order to humanize the plaza spaces. Warm materials should be used wherever possible. The use of specialty paving with rubble stone walls will soften plaza spaces dramatically.

The color and texture of walls, paving, and screens should be compatible with adjacent surfaces of the upstate South Carolina. Color ranges should be grays, blues, and light reds with a minimal use of brown.

Planters in the plaza areas should either be dish shaped planters or plants and tree wells in a tree grate configuration, approximately five (5) square feet in size, in order to allow trees to be flush with the plaza and the sidewalk.

Bikeways

The use of bikeways throughout the campus will be encouraged. Where bikeways parallel a concrete sidewalk, they should be at least three (3) feet in width and made of the similar material. Additionally, if bicycle pathways follow or parallel asphalt sidewalks, they should be at least three (3) feet in width and made of the same material. The same dimensions will apply for specialty paving walks. In order to separate the pedestrian pathway from the bicycle pathway, a line of transitional material at least eight (8) inches wide should be included in the paving.

Numerous bicycle parking areas should be located on the Campus and the paving design of such areas should be similar to the walkway seating area. Extensions should be made to sidewalks and pedestrian plazas in order to allocate space for bicycle racks. The bicycle rack illustrated in Illustration 5 depicts the preferred geometry. A white fluropolymer finish should be applied.

LANDSCAPE PLANT MATERIALS

A list of plants which will be acceptable for all Campus locations is set forth on Illustration 6.

This list is not intended to be all-inclusive, but is designed to establish a basic vocabulary of plant material for the campus.
The planting pallet can serve to provide continuity between individual projects within the Campus and should be adhered to as much as possible along with the primary roadways. The use of plant diversity and creative solutions to specific requirements will be encouraged. Included in the list are trees, shrubs, and ground covers that are indigenous to the area and are compatible with plantings in the main entrance and thoroughfares.

Due to individual site, soil, moisture and microclimate conditions, the use of a South Carolina registered landscape architect will be highly recommended to determine the appropriate plant materials for any particular development project.

In general the use of large masses of plant material is encouraged. Contrast in foliage texture and color and plant form should make plant masses discernable at a distance. Specimen plantings will be spaced to achieve natural form without growing into adjacent materials.

Evergreen material will be used to screen parking, service areas and utility structures wherever visible from visitor parking or circulation areas.

**SITE ACCESSORIES**

Benches, seating and tables should be encouraged in outdoor pedestrian spaces. The use of umbrella tables should also be considered at appropriate locations in order to promote casual eating, dining, and the use of pedestrian spaces during the hot summer months. Umbrella colors should be compatible with the context.

The furniture should be coated with white fluopolymer finish. Two types of trash receptacles will be acceptable. One type has a cover which would not allow rodents and rainwater to fill the trash receptacle. Receptacles without a cover may be used in areas that are sheltered from the elements.

Campus kiosks should be similar in design to the signage standards illustrated on Illustration 2.

Street furniture should have a metal finish which is comfortable and pliable. It should be painted with a white fluopolymer finish.

Retaining walls are acceptable in several types. The preferred retaining wall would be made of dry laid native stone in order to blend with the landscaping. The use of large boulders will also be permitted if they are planted with supplementary vegetation to soften the hard edges of the boulders.

A concrete cribbing retaining wall will be permitted as long as it is carefully planted with cotoneaster, jasmine, or some form of ivy which would ultimately cover the concrete cribbing wall.

Simple dry laid stone walls will also be acceptable.
Drinking fountains should be ADA accessible and have a white finish.

Bus shelters should be consistent with an international style. It would be preferable to use a white tubular structure with a butt glazed roof suspended below.

Walls other than retaining walls and fences will be used to provide visual screening, security, privacy, and sound attenuation. They should be constructed in accordance with the materials and details illustrated on Illustration 7.

Walls and fences within twenty (20) feet of a property line will be no more than three (3) feet six (6) inches high and made of solid material compatible with the base of the adjacent buildings. Open metal fences up to six (6) feet high may be used as required for security when compatible with the architecture of adjacent buildings.

The height of a fence, wall, berm or combination thereof around trash areas and service yards shall be the minimum required to visually conceal the structure from passing motorists and pedestrians.

Arbors and covered walks will be included as an integral part of public plazas and encouraged to be utilized by individual building developers.

Utility equipment, including power and communication lines, sewer lines, and water and irrigation pipes will be installed underground.

Necessary ground level utility equipment (meters, transformers, check valves, and so forth) and mechanical equipment for buildings shall be screened by landscape berms and/or walls or fences.

Flagpoles will be permitted elements at the entrance ways to complexes or at the main entranceway to buildings. Flagpoles may be up to thirty (30) feet high. County, state, local, and corporate flags may be displayed. The use of poles with an internal mechanical pulley system will be encouraged.

Mailboxes will be located at certain areas to be approved by the appropriate DRC. They must be built into rubble stone walls in order to be consistent with the landscaping. Newspaper, courier service, and parcel post boxes should also be concealed by a rubble stone wall.

The use of fountains will be encouraged from an aesthetic perspective and for sound attenuation purposes, particularly along major thoroughfares. Any number of fountain designs will be permissible. The range between highly articulated, very sophisticated fountains to rolling mountain streams with waterfalls will be encouraged. Fountains will be acceptable as public art.

Water features will also be highly desirable. These will include pools with a jet of water included as well as high design water features.
Illustration 4

CONCRETE
SPECIALTY PAVING
STONE
MASONRY
PRECAST PAVERS
PATTERNED CONCRETE

ROADWAY 15'

CONCRETE SIDEWALK

WALKWAYS
5' SIDEWALK MODULE
1" CONCRETE BAND WITH 3" CUT STONE INSERT

SEATING AREA
OR BICYCLE PARKING

5' MODULE

<table>
<thead>
<tr>
<th>PLANT LIST</th>
<th>BOTANICAL NAME</th>
<th>COMMON NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRASS/MULCH</td>
<td><em>FESCUE SP.</em> (P. SEASON PERMETS)</td>
<td>SEEDS/GRASS</td>
</tr>
<tr>
<td></td>
<td><em>DOUBLE GROUND HARDWOOD MULCH</em></td>
<td>MULCH</td>
</tr>
<tr>
<td>ANNUALS</td>
<td><em>COLEUS SP.</em></td>
<td>COLEUS</td>
</tr>
<tr>
<td></td>
<td><em>BEGONIA SP.</em></td>
<td>BEGONIA</td>
</tr>
<tr>
<td></td>
<td><em>VIOLA SP.</em></td>
<td>PANSIES</td>
</tr>
<tr>
<td></td>
<td><em>CALZANOULA SP.</em></td>
<td>MARIGOLDS</td>
</tr>
<tr>
<td></td>
<td><em>SALVIA SPLENDENS</em></td>
<td>RED SALVIA</td>
</tr>
<tr>
<td>FERENIALS</td>
<td>DAFDOIL SPECIES</td>
<td></td>
</tr>
<tr>
<td>GROUNDCOVERS</td>
<td><em>JASMINIUM ASIATICUM</em></td>
<td>ASIATIC JASMINE</td>
</tr>
<tr>
<td></td>
<td><em>LIRIOPE MURGARI</em></td>
<td>BIG BLUE LILYTurF</td>
</tr>
<tr>
<td></td>
<td><em>COTONEASTER DAMMERI</em></td>
<td>BEARBERRY GOTOONEASTER</td>
</tr>
<tr>
<td>SHRUBS</td>
<td>*ACORDA JAPONICA 'GOLD DUST'</td>
<td>JAPANESE AUCUBA</td>
</tr>
<tr>
<td></td>
<td><em>ELAEAGNUS F UNGENS</em></td>
<td>THORNY LABRAGNUS</td>
</tr>
<tr>
<td></td>
<td><em>EUONYMUS ALATUS</em></td>
<td>BURNING BUSH</td>
</tr>
<tr>
<td></td>
<td>*LEX CORNUTA 'BURFORDI NANA'</td>
<td>DWIGHT BURFORD HOLLY</td>
</tr>
<tr>
<td></td>
<td>*LEX CORNUTA 'CAKISSA'</td>
<td>CARISGA HOLLY</td>
</tr>
<tr>
<td></td>
<td><em>RAPHIOLEPSIS INDICA</em></td>
<td>INDIAN HAWTHORN</td>
</tr>
<tr>
<td></td>
<td><em>LEX OLSINA</em></td>
<td>INOBERY HOLLY</td>
</tr>
<tr>
<td></td>
<td>*LEX VOMITORIA 'NANA'</td>
<td>DWIGHT VAUPAT HOLLY</td>
</tr>
<tr>
<td></td>
<td><em>LIGUSTRUM JAPONICUM</em></td>
<td>WAX LEAF LIGUSTRUM</td>
</tr>
<tr>
<td></td>
<td><em>KALOSILA LATIFOLIA</em></td>
<td>MOUNTAIN LAUREL</td>
</tr>
<tr>
<td></td>
<td><em>LONICERUM CHINENSIS</em></td>
<td>CHINESE PRUNIE BUSH</td>
</tr>
<tr>
<td></td>
<td>*PRUNUS LAURUSUSIUS 'OTTO LUYKEN'</td>
<td>OTTO LUYKEN LAUREL</td>
</tr>
<tr>
<td></td>
<td><em>RHODODENDRONAZALEA SP.</em></td>
<td>RHODODENDRONS/ AZALEAS (ALL SPECIES)</td>
</tr>
<tr>
<td>TREES</td>
<td><em>ACER RUBRUM 'RED SUNSET'</em></td>
<td>RED SUNSET MAPLE</td>
</tr>
<tr>
<td></td>
<td><em>ACER RUBRUM 'OCTOBER GLORY'</em></td>
<td>OCTOBER GLORY MAPLE</td>
</tr>
<tr>
<td></td>
<td><em>ACER PALMATUM</em></td>
<td>JAPANESE MAPLE</td>
</tr>
<tr>
<td></td>
<td><em>CORONUS KOURSA</em></td>
<td>KUSA DOGWOOD</td>
</tr>
<tr>
<td></td>
<td><em>CORONUS MAS</em></td>
<td>CORONELIAN CHERRY DOGWOOD</td>
</tr>
<tr>
<td></td>
<td><em>CORONUS FLORIDA</em></td>
<td>FLOWERING DOGWOOD</td>
</tr>
<tr>
<td></td>
<td><em>ILEX 'NELLS STEVENS'</em></td>
<td>NELLS STEVENS HOLLY</td>
</tr>
<tr>
<td></td>
<td><em>LAGERSTROMIA X FAUREI</em></td>
<td>TUSCARA CRIPPE MYRTLE</td>
</tr>
<tr>
<td></td>
<td>*PRUNUS SERRULATA VAR. 'KWANZAN'</td>
<td>KWANZAN CHERRY</td>
</tr>
<tr>
<td></td>
<td><em>QUERCUS PHILLOS</em></td>
<td>WILLOW OAK</td>
</tr>
<tr>
<td></td>
<td><em>QUERCUS CLAUDIA</em></td>
<td>JAPANESE BLACK OAK</td>
</tr>
<tr>
<td></td>
<td><em>GINKO BILoba</em></td>
<td>GINKO TREE</td>
</tr>
<tr>
<td></td>
<td><em>TBUSA CAROLINA INANNA</em></td>
<td>CAROLINA HEMLOCK</td>
</tr>
</tbody>
</table>

Illustration 6
Illustration 7

- Newspaper/Feedy Container
- Rock Wall 4' High
- Typical Screening Device