3.4 ENVIRONMENTAL STANDARDS

3.4.1 GENERAL

Clarkson expects its Design Teams to employ the industry's best management practices and recommend innovative technologies, balanced with those that are time honored and proven.

Clarkson University signed the American College and University Presidents' Climate Commitment, an initiative to promote sustainable development among institutions of higher education. As Clarkson takes steps towards its target of climate neutrality by 2050, it aims to educate its community in the process by integrating sustainability into its curricular and co-curricular activities. This includes showcasing innovative practices for the education of its students, as well as incorporating cutting edge research into its built environment.

The university strives to manage its economic and natural resources responsibly and sustainably. Clarkson expects its Design Teams to adhere to the spirit of these commitments and priorities in their design of Clarkson's buildings and renovations.

3.4.2 REGULATORY ISSUES

- Corps of Engineers Wetlands Delineation Manual - 1987
- EPA Wetland Regulatory Authority – Regulatory Requirements:
  http://water.epa.gov/lawsregs/lawsguidance/cwa/wetlands/regs_index.cfm

3.4.3 EFFICIENT AND LONG LASTING BUILDINGS

References:

- Clarkson Climate Action Plan: TBD

3.4.3.1 Goals and Objectives

Clarkson expects its Design Teams to integrate passive and active resource reduction strategies into the building design for optimal operations.

3.4.3.2 Direct Energy Consumption

In its Planned Climate Action Plan, Clarkson plans to commit to reducing its use of non-renewable electricity and natural gas per square foot of built space, and per full-time equivalent student, by 10% below 2006 levels by 2024—a major milestone on the path to climate neutrality.

3.4.3.2.1 Construction

- Clarkson seeks contractors that share our commitment to sustainability. It is the expectation that contractors operate according to that shared commitment, to continually improve, and to minimize their energy consumption during construction.
- The contractor shall have mechanisms in place to measure and report their metered utilities use during construction when the University is not paying for utilities.

- The Contractor shall divert no less than 50% of its construction waste from landfills on new construction projects and renovation projects over $4 million. For smaller projects he intent is to maintain this safe level but we do not ask for reports on it.

- The Contractor shall utilize low flow and energy efficient plumbing and lighting fixtures employed for temporary use throughout the project.

3.4.3.2.2 Design

- New buildings will aim to meet LEED Silver minimum qualifications for buildings and explore the feasibility of renewable energy production.

- New buildings and significant existing building renovations shall look to achieve at least a 20% energy reduction from ANSI/ASHRAE/IES 90.1 -2013.

- The Contractor shall bring to Clarkson’s attention any exposed inefficient practices within existing facilities for consideration.

- Clarkson's brand promise is to provide an exceptional educational experience that inspires innovation, fosters thought leadership, and cultivates success. As requested by the owner and where appropriate, provide signage, mechanisms, educational tools, and/or ambient devices to engage and educate building stakeholders about their building and their impact within the building. The Design Team shall ensure that these reporting systems are installed and compatible with the existing technology infrastructure and building systems.

3.4.3.2.3 Final Measurement and Verification: How Buildings Perform

- The building shall be commissioned before being occupied and a full report provided to the University.

3.4.3.2.4 Renewable Energy

- As an institution of higher learning, Clarkson has the responsibility to be a leader in the community. Clarkson has a voluntary renewable energy standard goal of power generated from renewable sources. Each project should consider its environmental impact. Current goals should be identified and, if applicable, be implemented where possible.

3.4.3.2.5 Controls Systems

- Building utilities must be measurable so that they can be managed and controlled. Clarkson encourages collaborative decision-making processes that seek win-win solutions, as opposed to pitting one criteria against another. Technical elements of the Design Manual are not intended to limit opportunities to emplace proven energy saving measures.

- Measure and report utilities (such as lighting, HVAC, chilled/hot water, and potable water) at the building level and additional levels as determined by the design. The Design Team shall ensure that these reporting systems are installed and compatible with the existing technology infrastructure and building systems.

- In order to conserve and measure progress, campus utilities and energy use must be tracked at the level of individual buildings—at the minimum, for metered utilities such as electricity, chilled/hot water,

natural gas, and potable water. The Design Team shall ensure that these reporting systems are installed and compatible with the existing technology infrastructure and building systems.

3.4.3.3 Energy Efficiency Standards

As part of Clarkson's overall energy plan, energy efficiency standards have been adopted for the purchase of new equipment. Generally, the standards meet or exceed federal ENERGY STAR guidelines and specifications for energy efficiency. Due diligence must be completed by the Constructor to ensure that energy efficient products are used where feasible.

3.4.3.3.1 Energy Saving Performance Contract (ESPC)

- Clarkson is currently planning on replacing existing plumbing and lighting fixtures under an ESPC. The Design Team shall specify products that meet or exceed the efficiencies of these fixtures.

3.4.3.3.2 Water Efficiency

Clarkson strives to be a responsible steward of its water resources and to lower its consumption.

- The Design Team shall evaluate and integrate innovative technologies to address the challenges of harvesting, storing, reclaiming, and reusing its water resources. Design Teams may need to collaborate with and address concerns of local governing authorities in certain locations and situations.

- Water use in new buildings and existing building renovations shall be 30% below the Energy Policy Act of 1992 standards. Therefore, all new construction and existing building renovations shall have water efficient fixtures and products installed, such as low-flow faucets, showerheads, toilets (waterless toilets are not permitted), and appliances.

3.4.4 SUSTAINABLE SITES

References:

- Sustainable Sites Initiative (SITES)

- The Design Team shall utilize passive design strategies to create resource efficient buildings and to address important issues such as site impact, connectivity, water quality, and habitat protection.

3.4.4.1 Goals and Objectives

3.4.4.1.1 Site Development

Design Consultants must honor Clarkson's land use plans by showcasing—and restoring, where possible—the innate and historical features of the landscape. Consequently, before new buildings are constructed on campus, Clarkson asks its Design Teams to assist in determining whether the program utilizes space in the most effective way.

- Reuse or regenerate developed sites and/or underutilized land assets over green field sites. Consider the redevelopment of poorly used sites, including creating new open spaces, or reviving existing open spaces, to promote a sense of community with people and nature.

- Build close to existing infrastructure to minimize the need for tertiary development. For example, minimize utility runs. If infrastructure is not present, consider other sites.

- Choose building renovations over new construction. Consider solutions other than new construction to meet organizational and operational needs.
- Preserve special, protected, endangered, and critical habitats.

3.4.4.1.1.1 Siting to Encourage Energy Savings

The Design Team shall design its facilities to maximize the benefits of the building's location and orientation. Some examples include:

- Minimize energy use by using solar gain or shading to the maximum extent possible.
- Utilize natural ventilation techniques.
- Maximize views and spaces for peaceful contemplation by capitalizing on the surrounding natural beauty.

3.4.4.1.1.2 Hardscape

- The design team will encourage the use of materials that will reduce the heat island effect.
- Where possible, use generous shade tree plantings on streets and paved areas. The use of light-colored reflective materials will also contribute to cooler summertime temperatures, potentially saving on air conditioning costs and countering the effects of climate change. Within LEED certification, solar PV can also be considered to reduce heat island effects.

3.4.4.1.1.3 Lighting (energy efficient fixtures; reduced light pollution)

- Street and site lighting shall be designed to minimize light pollution while providing a safe and attractive civic environment.
    - Use glare shields and light angles to reduce potential glare into the nighttime sky.
    - Specify energy efficient and solar powered exterior lights to reduce energy consumption.
    - Use LED streetlights with 100% cutoff range and LED lights in pedestrian areas.
    - Consider directing exterior lights at items that will not reflect that light back up to the sky. For example, direct lights towards greenscape rather than towards light-colored exterior surfaces that will reflect the light back up to the sky.

3.4.4.1.1.4 Transportation Support Systems

Clarkson is working on transportation infrastructure improvements as well as educational outreach and expects the Design Team to design and plan Clarkson's facilities in support of these efforts. This includes the provision of:

- A sufficient pedestrian network around campus and connecting to surrounding communities. This concept also includes other non-motorized modes of transportation, as applicable.
- Adequate biking facilities such as bike racks, lockers, and showers for bicyclists.

- Connections to existing or planned bicycle and mass transit plans from area transportation providers.
- Opportunities to utilize carpool, vanpool, and/or alternative fueled vehicles.
- Access and education about virtual interaction and technology opportunities, such as video conferencing, within or close to the building to minimize need for additional travel.

3.4.4.1.1.5 Storm water Management

- Refer to NYS Department of Environmental Conservation and US Environmental Protection Agency for technical and regulatory information concerning Storm Water Management.
- The Design Team shall evaluate and integrate innovative technologies where applicable to address the challenges of harvesting, storing, reclaiming, and reusing its water resources. Design Teams may need to collaborate with and address concerns of local governing authorities in certain locations and situations.
- Clarkson's preference is to have more pervious than impervious surfaces on campus. Where possible, Clarkson encourages aquifer replenishment by allowing water to filter slowly into the groundwater table. Where feasible, use open channel storm drainage and vegetated swales for storm water conveyance instead of pipes.

3.4.4.1.2 Habitat and Wildlife Protection

Clarkson University is committed to employ strategies to efficiently use its land resources for development; promote a pedestrian and bicycle friendly campus; and strategically preserve its woodlands, wetlands, and waterways to maintain the campus image and provide for ecological diversity. Clarkson encourages a park concept and retention of natural species and habitat. The Design Teams shall emphasize the natural beauty of its woodlands, wetlands, and waterways while following Clarkson's landscaping requirements, see Chapter 4, DIV32 Site Improvements.

3.4.5 OCCUPANT ENGAGEMENT AND WELL-BEING

Clarkson's top priority is to provide students with a transformational learning experience that supports their growth as individuals, scholars, and professionals. In addition, Clarkson's brand promise is to provide an exceptional educational experience that inspires innovation, fosters thought leadership, and cultivates success. It is Clarkson's intent to educate its community on the challenges and opportunities for fostering a sustainable world.

- Design Teams shall look to provide interactive signage, mechanisms, tools, and/or ambient devices to engage the Clarkson community in the sustainability dialogue and help them to understand the impacts of their individual and collective actions.
- All spaces shall support occupant comfort and wellbeing, as well as a healthy, enjoyable environment in which its occupants thrive.

3.4.5.1 Indoor Environmental Quality

- The design Team shall design to minimize the energy consumption of its systems while maintaining comfort and wellness for building occupants. Clarkson wants to ensure that the appropriate amount of outdoor air is brought into its building systems to maintain a comfortable and healthy environment.

- For indoor air quality, comply with ANSI's ventilation standards. Refer to Section 3.3.1 – HVAC Systems for the appropriate ventilation standards for each type of room. Refer to ASHRAE 55 for thermal comfort.

- Construction cleanup and pre-occupancy cleaning must be coordinated with Clarkson's project manager to ensure the use of low toxicity products, equipment and techniques.

- The Design Team shall promote wellness activities for building occupants. This may include the design of certain elements such as clearly identified, aesthetically pleasing, easily accessible staircases for occupants to use instead of elevators; walking trails or connections; or areas for quiet contemplation and meditation

3.4.6 MATERIALS AND RESOURCES

Clarkson values innovative solutions from its Design Teams to help lessen the impact throughout a building's life cycle—from construction, to purchasing, to disposal, and remediation. As technology advances in this dynamic field, Clarkson's ultimate goal is to be a zero waste institution.

3.4.6.1 Renovation over new build

- The Design Team will evaluate and consider creative reuse and/or recycling of existing building materials. This may include, but is not limited to, salvaging materials and repurposing existing products.

- For new construction and existing building renovations, Clarkson strives for a minimum 50% construction diversion rate. Contractors shall provide proof of their construction diversion for projects that fall into his catagory.

3.4.6.2 Recycling Infrastructure

- The Design Team shall ensure each building occupant has easy, convenient access to a recycling collection site and that each common area, trash room, or lobby has enough designated space for a recycling center that accommodates all the streams of recycling collected at Clarkson.

- For every trash receptacle, a recycling receptacle shall be co-located with it.

3.4.6.3 Purchasing

- Preferences may be given to goods produced in NYS, goods or services or construction provided by NYS person, firms, or corporations. Preference may also be given to businesses that are small, women-owned, and minority-owned businesses. Clarkson strives to support the local economy and local businesses.

- Vendors offering take-back programs for packaging or spent products should also be favored. When possible specify and purchase products that:

    - Minimize packaging.
    - Use recycled content.
    - Use materials that minimize or have no off gassing (with a strong preference for those that do not off-gas at all)
    - Minimize use of toxic chemicals throughout their lifecycle. Use lighter Materials to minimize energy/transportation costs.
    - Use local materials, local vendors.
    - Are organically derived or have biodegradable waste streams.
    - Minimize water use.
    - Minimize energy use.
    - Minimize energy and paper use in procurement/contract management measures.
    - Minimize deliveries, minimize removal from campus.