University of St. Thomas
Anderson Parking Facility

LEED for New Construction V. 2.2

LEED Elements Assessment

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As the Anderson Parking Facility is a Stand Alone Parking Ramp it is not eligible for LEED Certification. However, in an effort to construct a more sustainable and green building the following LEED Elements were used at the Anderson Parking Facility. These concepts do not represent achieved credits, but represent the University of St. Thomas and Ryan Companies US, Inc. good faith effort to build a more sustainable facility. LEED Version 2.2 was used for this evaluation.

- **Sustainable Sites Perquisite 1** – Construction Activity Pollution Prevention
- **Sustainable Sites Credit 1** – Site Selection
- **Sustainable Sites Credit 4.1** – Alternative Transportation (Public Transportation Access)
- **Sustainable Sites Credit 5.1** – Site Development Protect or Restore Habitat
- **Sustainable Sites Credit 6.2** – Stormwater Design (Quality Control)
- **Sustainable Sites Credit 7.1** – Heat Island Effect(Non Roof)–Option 2
- **Sustainable Sites Credit 7.2** – Heat Island Effect - Roof
- **Sustainable Sites Credit 8** – Light Pollution Reduction
- **Water Efficiency Credit 1.2** – Water Efficient Landscaping
- **Materials and Resources Credit 2** – Construction Waste Management
- **Materials and Resources Credit 4.1** – Recycled Content
- **Materials and Resources Credits 5.1 & 5.2** - Regional Materials
- **Innovation in Design Credit 2** – LEED Accredited Professional
LEED Prerequisite
Sustainable Sites Prerequisite 1

A credit prerequisite is a condition or requirement that must be met before any project can be considered for LEED certification. In order to be LEED Certified a project must meet all prerequisites in the LEED for New Construction Handbook v. 2.2.

Prerequisite Intent
Reduce pollution from construction activities by controlling soil erosion, waterway sedimentation and airborne dust generation.

Prerequisite Requirements
Create and implement an Erosion and Sedimentation Control (ESC) Plan for all construction activities by doing the following:
- Prevent loss of soil during construction by stormwater runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse.
- Prevent sedimentation loss or storm sewer or receiving streams.
- Prevent polluting the air with dust and particulate matter.

Prerequisite Applied At Anderson Parking Facility
The Anderson Parking protected local stormwater systems, bodies of water, and rivers by successfully implementing an effective Erosion and Sedimentation Control Plan.

The photos below show the projects erosion control “socks” which prevent soils from running off the site in a rain event, as well as a stormwater sedimentation filter used to catch sedimentation at nearby stormwater manholes.

Pictures
Anderson Parking Facility
LEED Elements

**LEED Credit**
Sustainable Sites Credit 1 – Site Selection

**Credit Intent**
Avoid development of inappropriate sites and reduce the environmental impact from the location of a building on a site.

**Credit Requirements**
Do not develop buildings, hardscape, roads, or parking areas on portions of sites that meet any one of the following criteria:
- Prime Farmland as defined by the US Department of Agriculture
- Previously undeveloped land (Greenfield)
- Land that is habitat for federal or state threatened species
- Land within 100 feet of wetlands
- Previously undeveloped land within 50 feet of a body of water
- Land that before acquisition was previously a public park

**Credit Applied At Anderson Parking Facility**
The Anderson Parking Facility was not developed on any of the above sites. The facility replaced a potential heat island (tennis courts) and debris from the tennis court removal was recycled and thus diverted from local landfills.

The photos below show the tennis courts before construction and the parking facility nearing its completion.

**Pictures**
LEED Credit

Sustainable Sites Credit 4.1 – Alternative Transportation

Credit Intent

Reduce pollution and land development impacts from automobile use.

Credit Requirements

Locate project within ¼ mile of one or more stops for two or more public or campus bus lines usable by building occupants

Credit Applied At Anderson Parking Facility

The Anderson Parking is located within ¼ mile to both public and campus bus stops. The facility can allow for users to park at the facility and use public and campus transportation to other destinations. For example: a user could park at The Anderson Parking Facility in St. Paul and use public/campus transportation to travel to St. Thomas’ downtown Minneapolis Campus.

The pictures below show the UST Ramp and its proximity to Metro Transit bus stops as well as the major bus lines that run through St. Thomas.

Pictures
Anderson Parking Facility
LEED Elements

LEED Credit
Sustainable Sites Credit 5.1 – Site Development (Protect or Restore Habitat)

Credit Intent
Conserve existing natural areas and restore damaged areas to provide habitat and promote bio-diversity.

Credit Requirements
On previously developed or graded sites, restore or protect a minimum of 50% of the site area (excluding building footprint) with native or adapted vegetation.

Credit Applied At Anderson Parking Facility
The Anderson Parking Facility implements Sustainable Sites Credit 5.1 by specifying native and adapted vegetation in a “LEED Landscape Plan” (shown below). Examples of specified native and adapted plantings include:
- River Birch
- Autumn Blaze Maple
- Tiger Eyes Sumac
- Blue Muffin Viburnum
- Red Silver Miscanthus

Landscaping installation at the Anderson Parking Facility will begin in the Spring of ’09. The photo below shows the proposed “LEED Landscape Plan” for Spring ’09 installation.

Picture
LEED Credit
Sustainable Sites Credit 6.2 – Stormwater Design – Quality Control

Credit Intent
Reduce or eliminate water pollution by reducing impervious cover, increasing on-site infiltration, eliminating sources of contaminants, and removing pollutants from stormwater runoff.

Credit Requirements
Implement a stormwater management plan that reduces impervious cover, promotes infiltration and captures and treats the stormwater runoff from 90% of the average annual rainfall using best management practices (BMP’s).

BMP’s used to treat runoff must be capable of removing 80% of the average annual post development total suspended solids load based on existing monitoring reports.

Credit Applied At Anderson Parking Facility
The Anderson Parking Facility achieves stormwater quality control by using underground tanks to capture and treat stormwater runoff through filters in the Parking Ramp’s Baysaver Bayfilter System. This insures that stormwater runoff is not contaminated once it leaves the site.

The Pictures below show the Anderson Parking Facility’s Baysaver Bayfilter system being installed as well as section view of the Baysaver Sand Filter System.

Pictures
LEED Credit
Sustainable Sites Credit 7.1 – Heat Island Effect (Non Roof)

Credit Intent
Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat.

Credit Requirements

Option # 2
Place a minimum of 50% of parking spaces under cover (defined as underground, under deck, under roof, or under a building).

Credit Applied At Anderson Parking Facility
The Anderson Parking Facility minimizes heat island effect by complying with Option # 2 by placing over 80% of its parking spaces either underground or under the cover of parking decks. Minimizing heat islands provides enhanced comfort for building occupants and reduces heating and cooling costs.

Calculations: (% of Shaded Spaces) = (Shaded Spaces) / (Total Spaces)
(% of Shaded Spaces) = 750 / 886
(% of Shaded Spaces) = 84%

The photos below show the shade provided by the parking decks and the scissors ramp design. The decks allow the shaded parts of the ramp to remain cooler rather than a standard asphalt parking lot. Ramp users also benefit from their vehicles staying cooler as a result of the majority of parking spaces located under parking decks.

Pictures
LEED Credit

Sustainable Sites Credit 7.2 – Heat Island Effect (Roof)

Credit Intent

Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat.

Credit Requirements

Use roofing materials having a Solar Reflectance Index (SRI) equal or greater than 78 for a minimum of 75% of the roof surface.

Credit Applied At Anderson Parking Facility

The Anderson Parking Facility minimizes heat island effect (roof) by using White-Coated Gravel on a Built-Up Roof which achieves an SRI of 79. The Anderson Parking Facility does not meet the required 75% to achieve the credit. However, the reflective gravel will still help reduce cooling loads and heat island effects.

Solar Reflectance Index (SRI) is a measurement of a material’s ability to reject solar heat.

Calculations:

\[
\begin{align*}
\text{\% of SRI-78 Roof Area} &= \frac{\text{SRI-78 Roof Area}}{\text{Total Roof Area}} \\

&= \frac{1301 \text{ sq. ft.}}{2102 \text{ sq. ft.}} \\

&= 61.8\%
\end{align*}
\]

The photos below are taken from the tower crane at the Anderson Parking Facility showing the White-Coated Gravel on the Built-Up Roofing System.

Pictures
LEED Credit

Sustainable Sites Credit 8 – Light Pollution Reduction

Credit Intent

Minimize light trespass from the building and site, reduce sky-glow to increase night sky access, improve nighttime visibility through glare reduction, and reduce development impact on nocturnal environments.

Credit Requirements

Interior Lighting
All non emergency lighting shall be automatically controlled to turn off during non-business hours.

Exterior Lighting
Only light areas as required for safety and comfort. Do not exceed 80% of the lighting power densities for exterior areas and 50% for building facades and landscape features.

Credit Applied At Anderson Parking Facility

The Anderson Parking Facility utilizes both interior and exterior controls to comply with SS Credit 8 – Light Pollution Reduction. The Parking Facility is designed so that little to no light is spilled over into the surrounding community. Exterior lighting on the Parking Facility utilizes “full cut off fixtures,” meaning light only shines where it is needed for comfort and safety and is “cut off” from shining elsewhere. This is especially important when the Observatory is in use, insuring that the night sky has maximum viewing ability.

Below is an example of a photometric map for the Parking Facility which is used in the design of the lighting system.

Pictures
LEED Credit

Water Efficiency Credit 1.1 – Water Efficient Landscaping

Credit Intent

Limit or eliminate the use of potable water, or other natural surface or subsurface water resources available on or near the project site, for landscape irrigation.

Credit Requirements

Reduce potable water consumption for irrigation by 50% from a calculated mid summer baseline case.

Reductions shall be attributed to any combination of the following items:

- Plant Species Factor (Applies to UST)
- Irrigation Efficiency (Applies to UST)
- Use of Captured Rainwater (Applies to UST)
- Use of Recycled Wastewater (Not Applied)
- Use of Water Conveyed by a Public Agency (Not Applied)

Credit Applied At Anderson Parking Facility

The Anderson Parking Facility achieves water efficient landscaping by using water from an underground well located on the UST campus which captures and collects rainwater for use in irrigation. This insures that no potable water is used in the irrigation of the Parking Facility landscaping. The Parking Facility also utilizes plant species factor, meaning that the species of plants specified in the LEED Landscape Plan require less water than typical plantings. Lastly, the Parking Facility uses drip irrigation in planting areas to achieve higher irrigation efficiency. Drip irrigation insures less water is wasted in over watering and irrigation runoff. All of these factors help the facility to achieve a high water efficiency.

Landscaping installation at the Anderson Parking Facility will begin in the Spring of ’09.
LEED Credit
Materials and Resources Credit 2 – Construction Waste Management

Credit Intent
Divert construction and demolition debris from disposal in landfills and incinerators. Redirect recyclable recovered resources back to the manufacturing process. Redirect reusable materials to appropriate sites.

Credit Requirements
Recycle and/or salvage at least 50% of non-hazardous construction and demolition. Develop and implement a construction waste management plan that at a minimum identifies the materials to be diverted from disposal and whether the materials will be sorted on site or commingled.

Credit Applied At Anderson Parking Facility
The Anderson Parking Facility successfully implemented a construction waste management system to recycle 68% of all construction waste produced during construction. The materials selected to be recycled include: metals, concrete, sheetrock, cardboard, and wood. Ryan Companies US, Inc. partnered with Shamrock disposal to achieve 68% of construction waste recycled or diverted from local landfills.

Below are the reported total statistics from the project for the construction waste management plan.

<table>
<thead>
<tr>
<th></th>
<th>Number of Loads</th>
<th>Yards</th>
<th>Pounds of Const. Waste</th>
<th>Pounds Recycled</th>
<th>Material Recycled %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total:</strong></td>
<td>52</td>
<td>1540</td>
<td>612,900</td>
<td>418,140</td>
<td>68%</td>
</tr>
</tbody>
</table>
Anderson Parking Facility
LEED Elements

**LEED Credit**
Materials and Resources Credit 4.1 – Recycled Content

**Credit Intent**
Increase demand for materials with recycled content thereby reducing impacts from extraction & processing of virgin materials.

**Credit Requirements**
Use materials with recycled content such that the sum of post consumer content plus one-half of pre-consumer content constitutes at least 10% of the total value of materials on the project.

**Credit Applied At Anderson Parking Facility**
The Anderson Parking Facility achieves Materials and Resources Credit 4.1 by using over 14% recycled materials (based on cost). The majority of recycled content can be found in the steel reinforcing used to hold up the concrete parking decks in which 83% of the steel used was recycled. Recycled content was also used in the concrete used to pour the decks themselves. See calculations below:

Total Materials Cost (Divisions 2-10) : $3,789,773.00
Total Recycled Materials Cost : $538,557.87

% of Recycled Materials = (Total Recycled Content Cost) / (Total Materials Cost)
% of Recycled Materials = $538,557.87 / 3,789,773.00
% of Recycled Materials = 14.2%

The pictures below show the steel reinforcing covered with a protective coating in place before being covered with concrete, as well as the concrete with recycled content being poured over the reinforcing.

**Pictures**
LEED Credit
Materials and Resources Credit 5.1 & 5.2 – Regional Materials

Credit Intent
Increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the use of indigenous resources and reducing the environmental impacts resulting from transportation.

Credit Requirements
Use building materials or products that have been extracted, harvested, or recovered as well as manufactured, within 500 miles of the project site for a minimum of 20% (based on cost) of the total materials value (Divisions 2-10 CSI Format).

Credit Applied At Anderson Parking Facility
The Anderson Parking Facility achieves both Materials and Resource Credits 5.1 & 5.2 by obtaining over 31% of materials based on cost from within a 500 miles radius. The majority of the regional materials come from the concrete used for the decks of the ramp and the pre-cast concrete used for the exterior skin of the ramp. Regional materials also come the steel reinforcing used to hold up the parking decks. See calculations below:

Materials Cost (Divisions 2-10) : $3,789,773.00
Regional Materials Cost : $1,198,542.00

Percent of Regional Materials = (Regional Materials Cost) / (Materials Cost)
Percent of Regional Materials = $1,198,542 / 3,789,773.00
Percent of Regional Materials = 31.6%

The pictures below show the pre-cast concrete being installed and the level 2 concrete deck being poured. Both of which were used to achieve Regional Materials Credit 5.1 & 5.2.

Pictures
LEED Credit

Innovation & Design Process Credit 2 – LEED Accredited Professional

Credit Intent

To support and encourage the design and integration required by a LEED for New Construction green building project and to streamline the application and certification process.

Credit Requirements

At least one principal participant of the project team shall be a LEED Accredited Professional (AP).

Credit Applied At Anderson Parking Facility

Mark Welch was the Senior Project Manager for the Anderson Parking Facility. Mark attained his LEED Accreditation while working on the Anderson Parking Facility and played a key role in helping apply LEED Elements to the Parking Facility.