



**Designing Green Building Standards for the Ohio
Department of Rehabilitation and Correction (ODRC)**

Iris Borgert, Bang Liu, Nicholas Mollica, Abigail Ruehle, Grace Shisler, and Jack Sorce

School of Environment and Natural Resources, The Ohio State University

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Mr. Bruce Braine and Dr. Greg Hitzhusen

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Executive Summary

The Ohio Department of Rehabilitation and Correction (ODRC) is reimagining the way correctional facilities are designed to promote their mission “to reduce recidivism among those we touch” (Ohio Department of Rehabilitation and Correction, 2021). According to ODRC, recidivism is “any person returned to prison within 3 years of their release” (Ohio Department of Rehabilitation and Correction, 2021). Their plans for implementing green building designs in new projects reflect their commitment to their mission and sustainability efforts.

The team identified the following as our main research objectives:

- 1) Research Green Building Standards
- 2) Identify & Engage Key Stakeholders
- 3) Determine the Impact of ODRC Buildings
- 4) Propose ODRC Green Building Standards

We combined our research with ODRC’s vision to propose a unique set of Green Building Standards in a comprehensive scorecard format. The scorecard includes sixteen categories reflecting the sustainability and well-being goals of ODRC. Each category includes a list of credits weighted by individual points. The team determined point values based on research outcomes and established five different levels of achievement: Certified, Bronze, Silver, Gold, and Platinum.

Our final recommendations to ODRC include establishing specific parameters for each credit represented in the scorecard. Furthermore, the team encourages ODRC to include incarcerated individuals and staff perspectives when determining the criteria necessary for credit achievement.

Introduction

The team reflected on existing literature regarding sustainable construction and recidivism reports. The team used LEED and WELL building frameworks to address sustainability and well-being respectively within ODRC's Green Building Standards. This preliminary research guided the creation of our survey and motivated the team to observe current ODRC projects with a site visit.

The team identified that ODRC's Green Building Standards would affect incarcerated individuals at ODRC facilities the most. Therefore, we sent out a survey to members of the Ohio Reformatory for Women's (ORW) Horticulture Class and Green Team to understand the women's opinions on their current living conditions and recommendations for future buildings. We considered the responses and incorporated them into ODRC's Green Building Standards. The site visit gave us the opportunity to see ORW's LEED certified buildings. This site visit included an interview with three incarcerated members of the Green Team and expanded upon survey results, which provided insight when drafting ODRC's Green Building Standards.

The team evaluated ODRC's building impact through analyzing JadeTrack data. JadeTrack documents each correctional facility's electricity output, water usage, and waste. Baseline utility data determined areas of opportunity relative to ODRC's sustainability initiatives. These categories display important components in sustainable building design and shapes ODRC's Green Building Standards.

Background research coupled with results from the ORW survey and interviews revealed the importance of education in reducing recidivism. Therefore, the team added an additional category addressing education to ODRC's Green Building Standards. The final scorecard reflects the unique opportunities and limitations of correctional facilities in green building design.

Research Green Buildings Standards

The team used existing frameworks through both US Green Building Council LEED and International Well Building Institute WELL standards (U.S. Green Building Council, 2013; Delos, 2020), which we prioritized in the creation of new building standards for ODRC. To ensure a thorough research process, we collected data from other green building standards including EnergyStar compliance methods and US EPA recommended green building standards (Environmental Protection Agency, 2022; EnergyStar Portfolio Manager, 2021). Based on our examination of LEED and WELL standards, which can be seen in Appendices 2.1 and 2.2, we developed an initial list of standards that seemed most fitting for ODRC.

Reviewing Existing Literature on Sustainable Construction

We conducted research on existing sustainability campaigns within various domestic and internationally operated prisons. This included research focused on sustainable construction and design projects, as well as sustainability-integrated educational programming. The National Institute for Corrections funded the Green Corrections Project, which inspired the inclusion of not only sustainable construction and design, but educational programming and nature-based therapy (Connelly, 2021). We drew upon the Washington State Department of Corrections' Sustainability in Prisons Project (SPP) for examples of sustainable programming and functional green spaces. Their research revealed that 26% of individuals involved in SPP recidivated, compared to the general population at 34% (The Evergreen State College and Washington State Department of Corrections, 2020). ODRC utilizes their own programming as well as programming from Roots of Success (RoS), an "environmental literacy and work readiness program" (Roots of Success, 2016). RoS has several benefits including reducing recidivism, decreasing violence within correctional facilities, and increasing job prospects (Roots of Success, 2016). These statistics inspired the inclusion of sustainable construction and green programming within ODRC Green Building Standards.

Identify & Engage Key Stakeholders

Our main project partners, ODRC staff Cassidy Jenney and Robert Nauman, provided baseline data on the facilities, provided access to databases relevant to our project, and familiarized us with ODRC's priorities for this project. We identified our main stakeholders as ODRC organization, staff members, and incarcerated individuals.

Cassidy Jenney connected us with Jeremy Hyer and Todd Hager to further our knowledge on how ODRC pursues LEED and WELL standards. We learned that ODRC struggles to achieve LEED accreditation in transportation and water use, and WELL credits in air quality and sound prevention. We believe that these standards are relevant to the built environment, however, it is also important to foster relationships among the engaged stakeholders.

Conducting Survey of ODRC Occupants

We administered the survey, shown in Appendix 4, to 27 members of the Horticulture Class and 43 members of the Green Team at ORW. The survey consisted of two quantitative questions rating both subjective importance of WELL categories, as well as rating current conditions at ORW under the same categories. Healthy food, clean water, air quality, and green spaces scored the highest on average in terms of importance by ORW occupants. The top three aspects in terms of necessity for improvement at ORW included healthy food, green spaces, and noise management (Appendices 5.1 and 5.2). Participants were given the opportunity to respond to qualitative questions regarding existing and desired education programs. Qualitative responses showed overwhelming positive feedback in the value of community-building in current education programs, and an interest in education programs involving green programs/jobs, mental health, healthy community, and healthy foods. We considered these results when creating ODRC Green Building Standards by increasing scoring for nutrition, air quality, clean water, and community, and adding a new category for education.

Interview at ORW

We interviewed three incarcerated women involved in educational programs at ORW, which provided information that was in line with our survey results. We identified problem areas which included healthy foods, mental health, accessibility of educational programs, noise management, staff relations, and air quality. The combined survey and interview data helped us to develop scoring parameters based off the needs of incarcerated individuals. Most notably, the interview inspired us to include an education plan for all individuals and an orientation of available education opportunities.

Utilities Impact of ODRC Facilities

While researching the environmental and fiscal costs associated with ODRC, we focused solely on their 24 correctional facilities. We analyzed the facilities to identify strong and weak points, both between individual facilities and across all facilities. ODRC provided access to their utility portal JadeTrack, which we used to compile data on water, electricity, natural gas, and waste in a Microsoft Excel file. We created 5 different sheets in one excel file, one sheet each for water, electricity, natural gas, and waste, then a fifth sheet with a complete overview of each facility.

Our purpose for the JadeTrack data was to determine which areas accrue the most costs for ODRC, and which costs have the most potential for being lowered. To do this, we established a baseline for each of the four utility costs in terms of cost per square foot and cost per individual. If there was a relatively large deviation for this value, we can assume that there is a greater potential for cost and use mitigation. There was a

low deviation for natural gas and waste, which led us to believe that most ODRC facilities are already operating closer to their potential in these areas. On the other hand, the costs and usage of water varied greatly between facilities, which meant ODRC was in much more need for a unified standard aimed at reducing water usage (Appendix 3.1). This is evident in the water quality and efficiency category of the standards, which will be explained more in depth below. JadeTrack shows details on the amount of water use, the cost of water use, and whether each water usage is potable indoor/outdoor, well, or sewer water. We noticed that most of the variation comes from indoor potable water, which directly led to a required credit on reducing indoor potable water. An area where ODRC's utility tracking on JadeTrack falls short is the fact that ODRC does not meter individual buildings, which makes comparison between individual buildings impossible. This led to the inclusion of a requirement for individual building metering on our final ODRC Green Building Standards. This lack in metering also made us unable to quantitatively justify many of the standards in terms of cost savings, but we did establish baselines for each of utilities in terms of cost per square foot and cost per individual. These baselines will be provided to ODRC and should help them in the future in analyzing the success of the standards once they begin to be implemented.

To compare ODRC facilities to other correctional facilities throughout the country, we referred to site energy use intensity (site EUI), which is simply a measure of total utility footprint per square foot and is automatically tracked by JadeTrack. We used EnergyStar's database for making such comparisons. Although no correctional facilities registered with EnergyStar chose to make their utility information public, EnergyStar did

run a national median EUI study for various building types, which correctional facilities were included (Appendix 3.2). This study, which was most recently released in April 2021, found that the median site EUI¹ for prison/incarceration facilities was 69.9 kBtu/ft². JadeTrack lists the median site EUI across the 24 ODRC correctional facilities as 145.5 kBtu/ft². Although site EUI is a standardized index, EnergyStar's methods of data collection² make direct comparison slightly ineffective. Despite possible discrepancies, the research into EnergyStar and site EUI did yield the result that ODRC has room for improvement in utility management. On top of recommending metering for individual buildings, the group also made it a point to heavily weigh standards aimed at reducing utility usage.

Recommendations

The ODRC Green Building Standards

We combined criteria from the LEED Version 4 for Building Design and Construction scorecard (Appendix 2.1) and the WELL Certification v2 scorecard (Appendix 2.2) as a foundation for the sustainability and wellbeing portion of ODRC's Green Building Standards (U.S. Green Building Council, 2013; Delos, 2020). We took our knowledge of ODRC's sustainability goals and the results of our surveys and interviews to emphasize the categories that are the highest priority for ODRC. We created a framework that we

¹ It is worth noting that this study includes only facilities that report their utility information to EnergyStar, meaning that the facilities in the study are likely aimed at energy efficiency, and may not include random facilities that make no efforts at environmental efficiency.

² EnergyStar prompts the user to input any value for square footage. JadeTrack uses the combined square footage of indoor spaces, while any other facility could input the total square footage of their facility (both indoor and outdoor), which could result in discrepancies.

believe will have the greatest impact in improving ODRC facilities and the wellbeing of stakeholders at ODRC sites. We believe that this new set of standards will be more effective in helping ODRC meet their goals compared to using LEED or WELL standards alone or in combination.

The scorecard includes 16 different sections. These categories have different 'credits' listed within the section's table. There is an available point value associated with each credit depending on its weight, with the lower-rated aspects having less impact on the overall score. When facilities are rated, the points are allotted in the green, yellow, and red columns which convey full, partial, and no credit accordingly. Therefore, while there is a '0' above each colored column, these would change based on the points scored in each column. Facilities must achieve 'Required' credits to accomplish any level of the ODRC Green Building Standards. Aggregate point valuation is scored out of a total of 435 possible awarded points. A system of five possible achievement levels is broken down into 'Certified (200-249),' 'Bronze (250-299),' 'Silver (300-349),' 'Gold (350-400),' and 'Platinum (400-435),' to encourage achievement and continued improvement across facilities. Point breakdown for achievement levels was loosely determined by point percentage equivalence based on the existing LEED and WELL certification achievement levels. Though most achievement levels operate with a 49-point threshold, the 'Platinum' achievement level has only a 35-point threshold to distinguish it as the highest accreditation.

Categories included within the final scorecard and relative point values from highest to lowest are seen in the table below.

Category	Score
Materials & Resources	42
Community	40
Energy & Atmosphere	40
Nourishment	38
Education	36
Air Quality	32
Innovation	31
Sustainable Sites	30
Thermal Comfort	25
Mind	24
Sound	21
Location & Transportation	21
Movement	19
Lighting	17
Water Quality & Efficiency	15
Regional Priority	4

Air Quality

0	0	0	Air Quality	32	
Y			Credit	Meet Thresholds for Particulate Matter	Required
Y			Credit	Meet Thresholds for Organic Gases	Required
Y			Credit	Meet Thresholds for Inorganic Gases	Required
Y			Credit	Meet Thresholds for Radon	Required
Y			Credit	Measure Air Parameters	Required
Y			Credit	Prohibit Indoor Smoking	Required
Y			Credit	Ensure Adequate Ventilation	Required
Y			Credit	Mitigate Construction Pollution	Required
Y			Credit	Minimum Indoor Air Quality Performance	Required
			Credit	Prohibit Outdoor Smoking	1
			Credit	Enhanced Indoor Air Quality Strategies	2
			Credit	Meet Enhanced Thresholds for Particulate Matter	3
			Credit	Meet Enhanced Thresholds for Organic Gases	1
			Credit	Meet Enhanced Thresholds for Inorganic Gases	1
			Credit	Increase Outdoor Air Supply	2
			Credit	Improve Ventilation Effectiveness	2
			Credit	Provide Operable Windows	1
			Credit	Manage Window Use	1
			Credit	Install Indoor Air Monitors	2
			Credit	Promote Air Quality Awareness	1
			Credit	Design Healthy Entryways	1
			Credit	Perform Envelope Commissioning	1
			Credit	Manage Combustion	1
			Credit	Manage Pollution and Exhaust	2
			Credit	Implement Particle Filtration	1
			Credit	Improve Supply Air	2
			Credit	Implement Ultraviolet Treatment for HVAC Surfaces	1
			Credit	Low-Emitting Materials	3
			Credit	Construction Indoor Air Quality Management Plan	1
			Credit	Indoor Air Quality Assessment	2

The 'Air Quality' category addresses indoor and outdoor air quality. This category compiles 23 credits from WELL and seven components from LEED. The thresholds for certain credits will be determined by ODRC in compliance with traditional WELL standards. ODRC may struggle with implementing 'Install Indoor Air Monitors' and 'Provide Operable Windows' due to security reasons, but the importance of access to fresh air was stated during our interview at ORW (Delos, 2020).

Community

0	0	0	Community	40
Y			Credit Facilitate Stakeholder Charrette	Required
Y			Credit Develop Emergency Preparedness Plan	Required
Y			Credit Select Project Survey	Required
Y			Credit Administer Survey and Report Results	Required
			Credit Utilize Enhanced Survey	1
			Credit Utilize Pre- and Post-Occupancy Survey	2
			Credit Implement Action Plan	1
			Credit Facilitate Interviews, Focus Groups and/or Observation	3
			Credit Promote Health Benefits	1
			Credit Offer On-Demand Health Services	2
			Credit Offer Sick Leave	1
			Credit Support Community Immunity	1
			Credit Promote Culture of Health	1
			Credit Establish Health Promotion Leader	1
			Credit Offer Workplace Breastfeeding Support	1
			Credit Design Lactation Room	1
			Credit Offer Childcare Support	1
			Credit Offer Bereavement Support	1
			Credit Promote Community Engagement	2
			Credit Provide Community Space	1
			Credit Promote Diversity, Equity, and Inclusion	3
			Credit Integrate Universal Design	1
			Credit Provide Emergency Resources	1
			Credit Provide Opioid Response Kit and Training	1
			Credit Support Emergency Resilience	1
			Credit Facilitate Healthy Re-entry	5
			Credit Establish Health Entry Requirements	1
			Credit Allocate Affordable Units	1
			Credit Disclose Labor Practices	1
			Credit Implement Responsible Labor Practices	2
			Credit Support Victims of Domestic Violence	2

The 'Community' category supports the well-being of individuals through stakeholder engagement and responses to health concerns. We pulled criteria directly from the WELL scorecard. We omitted several criteria to reflect ODRC's limitations and narrow scope including 'Provide WELL Feature Guide,' 'Promote Health-Oriented Mission,' 'Offer New Parent Leave', and 'Promote Business Continuity'. The team identified the survey and interviews as essential components in shaping this scorecard and therefore increased the point values of 'Utilize Pre- and Post-Occupancy Survey' and 'Facilitate Interviews, Focus Groups, and/or Observations'. 'Facilitate Healthy Re-entry' earns one point in the WELL standard; however, this credit is an important part of helping

incarcerated individuals re-enter society and avoid recidivism. Therefore, the team scored this credit at 5 points. The team identified the absence of ‘equity’ within the ‘Promote Diversity and Inclusion’ credit of the WELL scorecard. We therefore modified this credit to ‘Promote Diversity, Equity, and Inclusion’ to encourage equitable practices within the prison system.

Education

0	0	0	Education	36
Y			Credit Provide Educational Programming	Required
Y			Credit Career Counselors Available for Individuals	Required
			Credit Education Plan for All Individuals	3
			Credit Orientation of Educational Opportunities Upon Entry	3
			Credit Staff Participation in Programming	5
			Credit Counselors for Educational Programming	3
			Credit External Partnership Programming	3
			Credit Positive Awareness Campaign	3
			Credit Nutrition Education	3
			Credit Promote Education Engagement	4
			Credit Offer Mental Health Education for Staff	3
			Credit Provide Restorative Programming	3
			Credit Offer Substance Use Education	3

The team created an entire category addressing education as a unique aspect of the ODRC Green Building Standard. The overwhelmingly positive impact of education programs was visible through our survey and interview results, as well as confirmed through reviewing existing literature. While education is referenced in various credits from the WELL framework, they existed within categories focused on achieving other parameters. The team adopted credits from WELL that addressed an education component including nutrition, substance abuse, and mental health education. These credits were compiled into the ‘Education’ category and the allotted points for all were increased to reflect the category’s high rank. Additional credits were included in the category to address educational opportunity for both incarcerated individuals and staff.

Credits addressing education plans and orientation of incarcerated individuals upon entry were created to ensure equitable awareness of programs provided, which was a concern indicated through survey results.

Energy & Atmosphere

0	0	0	Energy & Atmosphere	40
Y			Credit Fundamental Commissioning and Verification	Required
Y			Credit Building-Level Energy Metering	Required
Y			Credit Fundamental Refrigerant Management	Required
			Credit Enhanced Commissioning	6
			Credit Optimize Energy Performance	18
			Credit Advanced Energy Metering	3
			Credit Demand Response	2
			Credit Renewable Energy Production	4
			Credit Enhanced Refrigerant Management	1
			Credit Green Power and Carbon Offsets	6

The 'Energy & Atmosphere' category addresses energy performance and emissions monitoring. The category was taken directly from the LEED scorecard under the same labelling. The category is scored out of 40 points and is among the highest scoring categories. Scoring modifications reflects prioritization of specific credits. Notably, the 'Optimize Energy Performance' credit has a total of 18 potentially accredited points, the highest weighted credit of the entire scorecard. Point valuation for this credit reflects a high incentive for energy optimization and continued improvement in environmental responsibility. While there are fewer credits in this category, credits are weighed heavily to incentivize enhanced energy performance through achievement of credits.

Innovation

0	0	0	Innovation	31
			Credit Achieve Green Building Certification	10
			Credit Complete Health and Well-Being Programs	4
			Credit Propose Innovations	5
			Credit Carbon Inventory	3
			Credit Carbon Reduction Goal	3
			Credit Carbon Reduction	4
			Credit Carbon Neutral	2
			Credit LEED Accredited Professional	1

The innovation category focuses on existing green building accreditation services and carbon management. We pulled the credits 'Propose Innovations' and 'LEED Accredited Professional' from LEED's category for innovation, while the other six credits are from WELL. Even if ODRC moves away from LEED and WELL accreditation, we still believe having a LEED professional on the team is very beneficial. This professional would be able to offer expertise in what it takes to make a building as green and efficient as possible. The credits involving carbon are structured so that the facility can gain credit for varying levels of carbon mitigation. The first step is inventorying carbon, which is an important part of achieving carbon neutrality. The next step is setting goals for reducing carbon emissions. The credit for 'Carbon Reduction' is recommended to take the shape of some sort of yearly quota of carbon reduction, that can be set by ODRC as part of a carbon reduction goal. We recommend setting annual decreases in carbon emissions that can be monitored and achieved over a certain time frame that will eventually lead to carbon neutrality.

Lighting

0	0	0	Lighting	17
Y			Credit Provide Interior Lighting	Required
Y			Credit Provide Visual Acuity	Required
Y			Credit Meet Lighting for Day-Active People	Required
Y			Credit Provide Emergency Lighting	Required
			Credit Manage Glare from Electric Lighting	2
			Credit Implement Daylight Plan	3
			Credit Integrate Solar Shading	2
			Credit Conduct Daylight Simulation	3
			Credit Balance Visual Lighting	1
			Credit Enhance Color Rendering Quality	1
			Credit Manage Flicker	2
			Credit Enhance Occupant Controllability	2
			Credit Provide Supplemental Lighting	1

The 'Lighting' category addresses lighting quality within facilities. We chose 12 out of the 13 credits from WELL and added in the 'Required' 'Provide Emergency Lighting' credit to enhance safety measures. Although WELL scores the 'Light' category at 18 points, there are only two required categories which do not contribute to the category's score (Delos, 2020). Our 'Lighting' category has four 'Required' credits which lowers the score to 17 even with an additional category and boosted scores on certain credits. We granted an additional point to 'Implement Daylight Plan' and 'Conduct Daylight Simulation' to reflect on the survey results which signaled priority around facility lighting.

Location & Transportation

0	0	0	Location & Transportation	21
			Credit Sensitive Land Protection	3
			Credit High Priority Site	2
			Credit Surrounding Density and Diverse Uses	5
			Credit Access to Quality Transit	5
			Credit Bicycle Facilities	2
			Credit Reduced Parking Footprint	1
			Credit Green Vehicles	3

ODRC struggles to achieve traditional LEED standards in this category because of their location in rural areas and security protocols that limit access to transportation. For this reason, the category only makes up about 5% (21/435) of total points for our standards,

as opposed to the 15% (16/110) it accounted for in traditional LEED standards. The credit for 'Green Vehicles' had its point value increased on our standards, due to ODRC's stated goal at moving towards an electric fleet. The point value for 'Sensitive Land Protection' also increased in our standards, as we believe this is an important aspect for ODRC, given the increasingly vast land on which it operates. We recognize the importance of bicycle facilities and a reduced parking footprint, but ODRC faces difficulty in these areas due to the remote location of many facilities. We left these point values the same to encourage the establishment of bicycle facilities for both environmental sustainability and well-being of incarcerated individuals and staff.

Materials & Resources

0	0	0	Materials & Resources	42
Y			Credit Restrict Asbestos	Required
Y			Credit Restrict Mercury	Required
Y			Credit Restrict Lead	Required
Y			Credit Manage Asbestos Hazards	Required
Y			Credit Manage Lead Paint Hazards	Required
Y			Credit Manage Polychlorinated Biphenyl (PCB) Hazards	Required
Y			Credit Manage Exterior CCA Hazards	Required
Y			Credit Manage Lead Hazards	Required
Y			Credit Storage and Collection of Recyclables	Required
Y			Credit Provide a Construction and Demolition Waste Management Plan	Required
			Credit Assess and Mitigate Site Hazards	2
			Credit Select Compliant Interior Furnishings	2
			Credit Select Compliant Architectural and Interior Products	2
			Credit Limit VOCs from Wet-Applied Products	2
			Credit Restrict VOC Emissions from Furniture, Architectural and Interior Products	2
			Credit Select Products with Disclosed Ingredients	2
			Credit Select Products with Enhanced Ingredient Disclosure	1
			Credit Select Products with Third-Party Verified Ingredients	1
			Credit Select Materials with Enhanced Chemical Restrictions	1
			Credit Select Optimized Products	3
			Credit Implement a Waste Management Plan	1
			Credit Manage Pests	1
			Credit Improve Cleaning Practices	1
			Credit Select Sustainable Cleaning Products	2
			Credit Reduce Respiratory Particle Exposure	2
			Credit Address Surface Hand Touch	1
			Credit Building Life-Cycle Impact Reduction	5
			Credit Building Product Disclosure and Optimization - Environmental Product Declarations	2
			Credit Building Product Disclosure and Optimization - Sourcing of Raw Materials	4
			Credit Building Product Disclosure and Optimization - Material Ingredients	2
			Credit Construction and Demolition Waste Management	3

The 'Materials & Resources' category addresses the environmental health and safety of building materials and waste. The category combines parameters from both the 'Materials and Resources' section of the LEED scorecard and the 'Materials' section of the WELL scorecard. The category contains 30 separate credits, contributing to its high scoring. The category is the highest scoring of the entire scorecard, reflecting high prioritization of health and safety of materials. We increased credits pertaining to hazards and products within facilities to enhance environmental improvement.

Mind

0	0	0	Mind	24
Y			Credit Promote Mental Health and Well-being	Required
Y			Credit Provide Connection to Nature	Required
Y			Credit Provide Connection to Place	Required
Y			Credit Provide Substance Use and Addiction Services	Required
Y			Credit Limit Tobacco Availability	Required
			Credit Provide Tobacco Cessation Resources	2
			Credit Offer Mental Health Screening	2
			Credit Offer Mental Health Services	2
			Credit Offer Workplace Support	2
			Credit Support Mental Health Recovery	2
			Credit Develop Stress Management Plan	2
			Credit Support Healthy Working Hours	2
			Credit Provide Nap Policy and Space	1
			Credit Provide Restorative Space	3
			Credit Provide Nature Access Indoors	2
			Credit Provide Nature Access Outdoors	3
			Credit Provide Quality Views	1

Although mental health services did not receive a high level of importance in the survey results, we realized during our interview that more emphasis needed to be placed on these services. The team pulled the above credits from WELL's 'Mind' category and adjusted some of the scoring and 'Required' credits to reflect focus on improving mental health in facilities. Two additional credits, 'Provide Substance Use and Addiction Services' and 'Limit Tobacco Availability' were made 'Required' due to addictive tendencies in incarcerated individuals. Credits in WELL pertaining to education were transferred due to our inclusion of the separate educational component (Delos, 2020).

Movement

0	0	0	Movement	19
Y			Credit Provide Indoor Activity Spaces	Required
Y			Credit Provide Outdoor Physical Activity Space	Required
Y			Credit Offer Physical Activity Opportunities	Required
			Credit Provide Active Workstations	2
			Credit Provide Height-Adjustable Work Surfaces	2
			Credit Provide Support at Standing Workstations	1
			Credit Integrate Point-of-Decision Signage	1
			Credit Provide Self-Monitoring Tools	1
			Credit Implement an Ergonomics Program	1
			Credit Commit to Ergonomic Improvements	1
			Credit Support Remote Work Ergonomics	1
			Credit Support Visual Ergonomics	1
			Credit Promote Visible Stairs	2
			Credit Provide Cycling Infrastructure	2
			Credit Select Sites with Pedestrian-friendly Streets	2
			Credit Select Sites with Access to Mass Transit	2

The 'Movement' category includes parameters for infrastructure inside buildings in order to provide the greatest convenience for the incarcerated individuals. This category comes from the WELL standards with a total score of 19. We decided to omit 'Support Visual Ergonomics', 'Provide Height-Adjustable Work Surfaces' and 'Provide Support and Standing Workstations' from the 'Required' scoring, while 'Provide Chair Adjustability' was completely omitted due to low pertinence within a correctional facility. The team kept the scoring within the movement category except for 'Promote Visible Stairs.' We increased this credit one-point value to reflect the importance of safety.

Nourishment

0	0	0	Nourishment	38
Y			Credit Provide Fruits and Vegetables	Required
Y			Credit Address Food Allergens	Required
Y			Credit Label Sugar Content	Required
Y			Credit Accommodate Special Diets	Required
Y			Credit Label Food Allergens	Required
			Credit Limit Total Sugars	1
			Credit Promote Whole Grains	3
			Credit Optimize Food Advertising	1
			Credit Limit Artificial Ingredients	3
			Credit Promote Healthy Portions	2
			Credit Support Mindful Eating	2
			Credit Provide Meal Support	2
			Credit Implement Responsible Sourcing	5
			Credit Provide Gardening Space	3
			Credit Ensure Local Food Access	3
			Credit Limit Red and Processed Meats	2
			Credit Implement Food Management Plan	2
			Credit Measure Food Waste	4
			Credit Provide Opportunity for Stakeholder Feedback	2
			Credit Respond to Stakeholder Feedback	3

The team adjusted the 'Nourishment' category to reflect incarcerated individuals' concerns expressed in the surveys and interviews. In the WELL framework, 'Nourishment' is worth only 16 points for the entire category (Delos, 2020). However, in the ODRC Green Buildings Standards, the 'Nourishment' category ranks third overall with a score of 38 points. The team increased the points for all credits except 'Limit Total Sugars' due to 'Label Sugar Content' already being 'Required'. The highest scored credit in this category, 'Implement Responsible Sourcing', reflects the intersection of ODRC's goals for sustainability and wellness. The team added 'Implement Food Management Plan', 'Measure Food Waste', 'Provide Opportunity for Stakeholder Feedback', and 'Respond to Stakeholder Feedback' to increase ODRC's overall standards in relation to 'Nourishment' and address concern for consistent food waste at ODRC. ODRC is obligated to serve a full meal to incarcerated individuals, even if individuals do not wish to consume a part of their meal. Scoring 'Measure Food Waste' will encourage facilities to adopt this action and therefore make changes to the food

they serve by observing how much and what kind of food is being wasted. The team adjusted the points of 'Accommodate Special Diets' and 'Label Food Allergens' credits to 'Required'. This change requires ODRC to observe special diets for religious or personal reasons. The team omitted 'Promote Fruit and Vegetable Visibility', 'Provide Nutritional Information', 'Label Sugar Content', and 'Provide Meal Support' and moved 'Provide Nutritional Education' to the 'Education' category on our scorecard to better organize its credits.

Regional Priority

0	0	0	Regional Priority	4	
			Credit	Regional Priority: Specific Credit	1
			Credit	Regional Priority: Specific Credit	1
			Credit	Regional Priority: Specific Credit	1
			Credit	Regional Priority: Specific Credit	1

The 'Regional Priority' category in the ODRC Green Building Standards is identical to the section of the LEED scorecard. This section addresses geographically specific environmental concerns. For ODRC, this includes specific facility sites and will change between regions.

Sound

0	0	0	Sound	21	
Y			Credit	Label Acoustic Zones	Required
			Credit	Provide Acoustic Design Plan	1
			Credit	Limit Background Noise Levels	3
			Credit	Design for Sound Isolation at Walls and Doors	1
			Credit	Achieve Sound Isolation at Walls	2
			Credit	Achieve Reverberation Time Thresholds	2
			Credit	Implement Sound Reducing Surfaces	4
			Credit	Provide Minimum Background Sound	1
			Credit	Provide Enhanced Speech Reduction	1
			Credit	Specify Impact Noise Reducing Flooring	1
			Credit	Meet Thresholds for Impact Noise Rating	3
			Credit	Provide Enhanced Speech Intelligibility	1
			Credit	Implement a Hearing Health Conservation Program	1

The 'Sound' category is compiled of 13 WELL credits from the 'Sound' category. We decided that some credits should be scored higher to reflect the survey results. Results showed us that noise management was an important parameter for incarcerated individuals. However, correctional facilities cannot commit fully to minimizing noise for safety reasons. Even though noise management was a key point of contention, we did not scale up the credit scores substantially due to safety precautions in correctional facilities. The team decided that the credit 'Provide Acoustic Design Plan' was not necessary to require and 'Prioritize Audio Devices and Policies' could be omitted in a correction facility environment.

Sustainable Sites

0	0	0	Sustainable Sites	30
Y			Credit Construction Activity Pollution Prevention	Required
Y			Credit Site Assessment	Required
			Credit Site Development - Protect or Restore Habitat	5
			Credit Open Space	3
			Credit Rainwater Management	3
			Credit Heat Island Reduction	4
			Credit Light Pollution Reduction	3
			Credit Tenant Design and Construction Guidelines	5
			Credit Provide Functional Green Spaces	5
			Credit Enhance Outdoor Natural Aesthetics	2

The 'Sustainable Sites' category addresses concerns during and beyond the construction period. This section comes from the LEED standards and has a total score of '30'. We added the 'Site Assessment' to the 'Required' scoring, and incorporated 'Tenant Designs and Construction Guidelines', 'Provide Functional Green Spaces' and 'Enhance Outdoor Natural Aesthetics' to the parameters. The team increased the total score of the LEED category by 20 points. The original range of 'Sustainable Sites' in the LEED framework was '1' to '2' points, however, the team increased the values for the

credits to '2' to '5' points for each parameter. This category offers the opportunity to address sustainability with the introduction of a new build. Therefore, the team found it necessary to incentivize environmentally friendly actions.

Thermal Comfort

0	0	0	Thermal Comfort	25	
Y			Credit	Provide Acceptable Thermal Environment	Required
Y			Credit	Monitor Thermal Parameters	Required
			Credit	Survey for Thermal Comfort	3
			Credit	Provide Thermostat Control	2
			Credit	Provide Personal Cooling Options	1
			Credit	Provide Personal Heating Options	1
			Credit	Allow Flexible Dress Code	1
			Credit	Implement Radiant Heating	2
			Credit	Implement Radiant Cooling	2
			Credit	Monitor Thermal Environment	3
			Credit	Manage Relative Humidity	2
			Credit	Provide Windows with Multiple Opening Modes	1
			Credit	Manage Outdoor Heat	1
			Credit	Avoid Excessive Wind	1
			Credit	Support Outdoor Nature Access	5

'Thermal Comfort' is a category of WELL that we left largely unchanged in our standards. Incarcerated individuals and ODRC staff deserve the same right to thermal comfort as any other population in their living and working environments. The 'Allow Flexible Dress Code' credit is slightly restricted in this context, but for these standards it simply means the ability to wear something warmer when it is cold or cooler when it is warm. 'Windows with Multiple Opening Modes' is partially restricted in this context, but the availability of fresh air was recognized as important from our surveys and interviews. 'Survey for Thermal Comfort' is an important credit to have, as it offers incarcerated individuals and staff the chance to have a formal say in the thermal conditions of their living and working environment. The structure of such surveying would be left up to ODRC, but feedback on thermal comfort in some capacity is valuable. We sharply increased the point value of 'Support Outdoor Nature Access', due to stated desires

from the interview, and stated goals of ODRC to incorporate access to nature as part of mental health services.

Water Quality & Efficiency

0	0	0	Water Quality & Efficiency	15	
Y			Credit	Verify Water Quality Indicators	Required
Y			Credit	Meet Chemical Thresholds	Required
Y			Credit	Meet Thresholds for Organics and Pesticides	Required
Y			Credit	Monitor Chemical and Biological Water Quality	Required
Y			Credit	Implement Legionella Management Plan	Required
Y			Credit	Outdoor Water Use Reduction	Required
Y			Credit	Indoor Water Use Reduction	Required
Y			Credit	Building-Level Water Metering	Required
Y			Credit	Ensure Drinking Water Access	Required
			Credit	Meet Thresholds for Drinking Water Taste	1
			Credit	Assess and Maintain Drinking Water Quality	3
			Credit	Promote Drinking Water Transparency	1
			Credit	Design Envelope for Moisture Protection	1
			Credit	Design Interiors for Moisture Management	1
			Credit	Implement Mold and Moisture Management Plan	2
			Credit	Enhance Bathroom Accommodations	1
			Credit	Support Effective Handwashing	1
			Credit	Implement Safety Plan for Non-Potable Water Capture and Reuse	2
			Credit	Cooling Tower Water Use	2

All credits for this section come from the WELL framework except 'Cooling Tower Water Use,' 'Outdoor Water Use Reduction,' and 'Indoor Water Use Reduction' which come from LEED. The team made 'Outdoor' and 'Indoor Water Use Reduction' 'Required' for the ODRC Green Building Standard to improve ODRC's water efficiency. The team increased points for 'Assess and Maintain Drinking Water Quality' and 'Implement Mold and Moisture Management Plan' in response to survey and interview results stressing 'Clean Water' as second most important. While the score of this section is significantly lower than other categories, the 'Required' standards fully address the health factors of clean water.

Recommendations for Implementation of the ODRC Green Building Standards

We recommend the formal adoption and implementation of our proposed Green Building Standards. All categories represented within the final scorecard are necessary to achieve the goals set forth by ODRC, though measures taken to achieve scorecard credits are to be determined by ODRC. To ensure that they score future builds along the same guidelines, it is imperative that ODRC finalize these specific parameters. The team recommends a certification system that awards various levels of achievement based upon points allotted. This certification system will give ODRC benchmarking capabilities to track their progress in future years. The team plans to remain in connection with ODRC partners to discuss formal naming and trademarking of the proposed ODRC Green Building Standards.

Conclusion

Through extensive research, as well as engaging internal stakeholders, we drafted a unique set of Green Building Standards aimed at improving living conditions at ODRC facilities, an essential component in reducing recidivism. Through this report, ODRC will understand the process of drafting the Green Building Standards and take into consideration our recommendations for implementation. This report also addresses aspects such as providing healthier foods, building partnerships with external stakeholders, using data to justify environmental building standards, and incorporating surveys and interviews to implement human-oriented standards. ODRC can apply direct feedback from its residents who are most directly affected by building design. This showcases ODRC's dedication to their mission and highlights how Ohio correctional

facilities can trailblaze green building standards by considering incarcerated individuals and addressing sustainability. Overall, this project benefits both ODRC and the School of Environment and Natural Resources (SENR) through collaborative networking opportunities and utilizing progressive ideas among student-led research groups.

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Appendices

Appendix 1: ODRC Green Building Standards Scorecard

1.1 – The Air Quality category of ODRC Green Building Scorecard:

0	0	0	Air Quality	32
Y			Credit Meet Thresholds for Particulate Matter	Required
Y			Credit Meet Thresholds for Organic Gases	Required
Y			Credit Meet Thresholds for Inorganic Gases	Required
Y			Credit Meet Thresholds for Radon	Required
Y			Credit Measure Air Parameters	Required
Y			Credit Prohibit Indoor Smoking	Required
Y			Credit Ensure Adequate Ventilation	Required
Y			Credit Mitigate Construction Pollution	Required
Y			Credit Minimum Indoor Air Quality Performance	Required
			Credit Prohibit Outdoor Smoking	1
			Credit Enhanced Indoor Air Quality Strategies	2
			Credit Meet Enhanced Thresholds for Particulate Matter	3
			Credit Meet Enhanced Thresholds for Organic Gases	1
			Credit Meet Enhanced Thresholds for Inorganic Gases	1
			Credit Increase Outdoor Air Supply	2
			Credit Improve Ventilation Effectiveness	2
			Credit Provide Operable Windows	1
			Credit Manage Window Use	1
			Credit Install Indoor Air Monitors	2
			Credit Promote Air Quality Awareness	1
			Credit Design Healthy Entryways	1
			Credit Perform Envelope Commissioning	1
			Credit Manage Combustion	1
			Credit Manage Pollution and Exhaust	2
			Credit Implement Particle Filtration	1
			Credit Improve Supply Air	2
			Credit Implement Ultraviolet Treatment for HVAC Surfaces	1
			Credit Low-Emitting Materials	3
			Credit Construction Indoor Air Quality Management Plan	1
			Credit Indoor Air Quality Assessment	2

1.2 – The Community category of the ODRC Green Building Standards:

0	0	0	Community	40
Y			Credit Facilitate Stakeholder Charrette	Required
Y			Credit Develop Emergency Preparedness Plan	Required
Y			Credit Select Project Survey	Required
Y			Credit Administer Survey and Report Results	Required
			Credit Utilize Enhanced Survey	1
			Credit Utilize Pre- and Post-Occupancy Survey	2
			Credit Implement Action Plan	1
			Credit Facilitate Interviews, Focus Groups and/or Observation	3
			Credit Promote Health Benefits	1
			Credit Offer On-Demand Health Services	2
			Credit Offer Sick Leave	1
			Credit Support Community Immunity	1
			Credit Promote Culture of Health	1
			Credit Establish Health Promotion Leader	1
			Credit Offer Workplace Breastfeeding Support	1
			Credit Design Lactation Room	1
			Credit Offer Childcare Support	1
			Credit Offer Bereavement Support	1
			Credit Promote Community Engagement	2
			Credit Provide Community Space	1
			Credit Promote Diversity, Equity, and Inclusion	3
			Credit Integrate Universal Design	1
			Credit Provide Emergency Resources	1
			Credit Provide Opioid Response Kit and Training	1
			Credit Support Emergency Resilience	1
			Credit Facilitate Healthy Re-entry	5
			Credit Establish Health Entry Requirements	1
			Credit Allocate Affordable Units	1
			Credit Disclose Labor Practices	1
			Credit Implement Responsible Labor Practices	2
			Credit Support Victims of Domestic Violence	2

1.3 – The Education category of the ODRC Green Building Standards:

0	0	0	Education	36
Y			Credit Provide Educational Programming	Required
Y			Credit Career Counselors Available for Individuals	Required
			Credit Education Plan for All Individuals	3
			Credit Orientation of Educational Opportunities Upon Entry	3
			Credit Staff Participation in Programming	5
			Credit Counselors for Educational Programming	3
			Credit External Partnership Programming	3
			Credit Positive Awareness Campaign	3
			Credit Nutrition Education	3
			Credit Promote Education Engagement	4
			Credit Offer Mental Health Education for Staff	3
			Credit Provide Restorative Programming	3
			Credit Offer Substance Use Education	3

1.4 – The Energy & Atmosphere category of the ODRC Green Building Standards:

0	0	0	Energy & Atmosphere	40
Y			Credit Fundamental Commissioning and Verification	Required
Y			Credit Building-Level Energy Metering	Required
Y			Credit Fundamental Refrigerant Management	Required
			Credit Enhanced Commissioning	6
			Credit Optimize Energy Performance	18
			Credit Advanced Energy Metering	3
			Credit Demand Response	2
			Credit Renewable Energy Production	4
			Credit Enhanced Refrigerant Management	1
			Credit Green Power and Carbon Offsets	6

1.5 – The Innovation category of the ODRC Green Building Standards:

0	0	0	Innovation	31
			Credit Achieve Green Building Certification	10
			Credit Complete Health and Well-Being Programs	4
			Credit Propose Innovations	5
			Credit Carbon Inventory	3
			Credit Carbon Reduction Goal	3
			Credit Carbon Reduction	4
			Credit Carbon Neutral	2
			Credit LEED Accredited Professional	1

1.6 – The Lighting category of the ODRC Green Building Standards:

0	0	0	Lighting	17
Y			Credit Provide Interior Lighting	Required
Y			Credit Provide Visual Acuity	Required
Y			Credit Meet Lighting for Day-Active People	Required
Y			Credit Provide Emergency Lighting	Required
			Credit Manage Glare from Electric Lighting	2
			Credit Implement Daylight Plan	3
			Credit Integrate Solar Shading	2
			Credit Conduct Daylight Simulation	3
			Credit Balance Visual Lighting	1
			Credit Enhance Color Rendering Quality	1
			Credit Manage Flicker	2
			Credit Enhance Occupant Controllability	2
			Credit Provide Supplemental Lighting	1

1.7 – The Location & Transportation category of the ODRC Green Building Standards:

0	0	0	Location & Transportation	21
			Credit Sensitive Land Protection	3
			Credit High Priority Site	2
			Credit Surrounding Density and Diverse Uses	5
			Credit Access to Quality Transit	5
			Credit Bicycle Facilities	2
			Credit Reduced Parking Footprint	1
			Credit Green Vehicles	3

1.8 – The Materials & Resources category of the ODRC Green Building Standards:

0	0	0	Materials & Resources	42
Y			Credit Restrict Asbestos	Required
Y			Credit Restrict Mercury	Required
Y			Credit Restrict Lead	Required
Y			Credit Manage Asbestos Hazards	Required
Y			Credit Manage Lead Paint Hazards	Required
Y			Credit Manage Polychlorinated Biphenyl (PCB) Hazards	Required
Y			Credit Manage Exterior CCA Hazards	Required
Y			Credit Manage Lead Hazards	Required
Y			Credit Storage and Collection of Recyclables	Required
Y			Credit Provide a Construction and Demolition Waste Management Plan	Required
			Credit Assess and Mitigate Site Hazards	2
			Credit Select Compliant Interior Furnishings	2
			Credit Select Compliant Architectural and Interior Products	2
			Credit Limit VOCs from Wet-Applied Products	2
			Credit Restrict VOC Emissions from Furniture, Architectural and Interior Products	2
			Credit Select Products with Disclosed Ingredients	2
			Credit Select Products with Enhanced Ingredient Disclosure	1
			Credit Select Products with Third-Party Verified Ingredients	1
			Credit Select Materials with Enhanced Chemical Restrictions	1
			Credit Select Optimized Products	3
			Credit Implement a Waste Management Plan	1
			Credit Manage Pests	1
			Credit Improve Cleaning Practices	1
			Credit Select Sustainable Cleaning Products	2
			Credit Reduce Respiratory Particle Exposure	2
			Credit Address Surface Hand Touch	1
			Credit Building Life-Cycle Impact Reduction	5
			Credit Building Product Disclosure and Optimization - Environmental Product Declarations	2
			Credit Building Product Disclosure and Optimization - Sourcing of Raw Materials	4
			Credit Building Product Disclosure and Optimization - Material Ingredients	2
			Credit Construction and Demolition Waste Management	3

1.9 – The Mind category of the ODRC Green Building Standards:

0	0	0	Mind	24
Y			Credit Promote Mental Health and Well-being	Required
Y			Credit Provide Connection to Nature	Required
Y			Credit Provide Connection to Place	Required
Y			Credit Provide Substance Use and Addiction Services	Required
Y			Credit Limit Tobacco Availability	Required
			Credit Provide Tobacco Cessation Resources	2
			Credit Offer Mental Health Screening	2
			Credit Offer Mental Health Services	2
			Credit Offer Workplace Support	2
			Credit Support Mental Health Recovery	2
			Credit Develop Stress Management Plan	2
			Credit Support Healthy Working Hours	2
			Credit Provide Nap Policy and Space	1
			Credit Provide Restorative Space	3
			Credit Provide Nature Access Indoors	2
			Credit Provide Nature Access Outdoors	3
			Credit Provide Quality Views	1

1.10 – The Movement category of the ODRC Green Building Standards:

0	0	0	Movement	19
Y			Credit Provide Indoor Activity Spaces	Required
Y			Credit Provide Outdoor Physical Activity Space	Required
Y			Credit Offer Physical Activity Opportunities	Required
			Credit Provide Active Workstations	2
			Credit Provide Height-Adjustable Work Surfaces	2
			Credit Provide Support at Standing Workstations	1
			Credit Integrate Point-of-Decision Signage	1
			Credit Provide Self-Monitoring Tools	1
			Credit Implement an Ergonomics Program	1
			Credit Commit to Ergonomic Improvements	1
			Credit Support Remote Work Ergonomics	1
			Credit Support Visual Ergonomics	1
			Credit Promote Visible Stairs	2
			Credit Provide Cycling Infrastructure	2
			Credit Select Sites with Pedestrian-friendly Streets	2
			Credit Select Sites with Access to Mass Transit	2

1.11 – The Nourishment category of the ODRC Green Building Standards:

0	0	0	Nourishment	38
Y			Credit Provide Fruits and Vegetables	Required
Y			Credit Address Food Allergens	Required
Y			Credit Label Sugar Content	Required
Y			Credit Accommodate Special Diets	Required
Y			Credit Label Food Allergens	Required
			Credit Limit Total Sugars	1
			Credit Promote Whole Grains	3
			Credit Optimize Food Advertising	1
			Credit Limit Artificial Ingredients	3
			Credit Promote Healthy Portions	2
			Credit Support Mindful Eating	2
			Credit Provide Meal Support	2
			Credit Implement Responsible Sourcing	5
			Credit Provide Gardening Space	3
			Credit Ensure Local Food Access	3
			Credit Limit Red and Processed Meats	2
			Credit Implement Food Management Plan	2
			Credit Measure Food Waste	4
			Credit Provide Opportunity for Stakeholder Feedback	2
			Credit Respond to Stakeholder Feedback	3

1.12 – The Regional Priority category of the ODRC Green Building Standards:

0	0	0	Regional Priority	4
			Credit Regional Priority: Specific Credit	1
			Credit Regional Priority: Specific Credit	1
			Credit Regional Priority: Specific Credit	1
			Credit Regional Priority: Specific Credit	1

1.13 – The Sound category of the ODRC Green Building Standards:

0	0	0	Sound	21
Y			Credit Label Acoustic Zones	Required
			Credit Provide Acoustic Design Plan	1
			Credit Limit Background Noise Levels	3
			Credit Design for Sound Isolation at Walls and Doors	1
			Credit Achieve Sound Isolation at Walls	2
			Credit Achieve Reverberation Time Thresholds	2
			Credit Implement Sound Reducing Surfaces	4
			Credit Provide Minimum Background Sound	1
			Credit Provide Enhanced Speech Reduction	1
			Credit Specify Impact Noise Reducing Flooring	1
			Credit Meet Thresholds for Impact Noise Rating	3
			Credit Provide Enhanced Speech Intelligibility	1
			Credit Implement a Hearing Health Conservation Program	1

1.14 – The Sustainable Sites category of the ODRC Green Building Standards:

0	0	0	Sustainable Sites	30
Y			Credit Construction Activity Pollution Prevention	Required
Y			Credit Site Assessment	Required
			Credit Site Development - Protect or Restore Habitat	5
			Credit Open Space	3
			Credit Rainwater Management	3
			Credit Heat Island Reduction	4
			Credit Light Pollution Reduction	3
			Credit Tenant Design and Construction Guidelines	5
			Credit Provide Functional Green Spaces	5
			Credit Enhance Outdoor Natural Aesthetics	2

1.15 – The Thermal Comfort category of the ODRC Green Building Standards:

0	0	0	Thermal Comfort	25
Y			Credit Provide Acceptable Thermal Environment	Required
Y			Credit Monitor Thermal Parameters	Required
			Credit Survey for Thermal Comfort	3
			Credit Provide Thermostat Control	2
			Credit Provide Personal Cooling Options	1
			Credit Provide Personal Heating Options	1
			Credit Allow Flexible Dress Code	1
			Credit Implement Radiant Heating	2
			Credit Implement Radiant Cooling	2
			Credit Monitor Thermal Environment	3
			Credit Manage Relative Humidity	2
			Credit Provide Windows with Multiple Opening Modes	1
			Credit Manage Outdoor Heat	1
			Credit Avoid Excessive Wind	1
			Credit Support Outdoor Nature Access	5

1.16 – The Water Quality & Efficiency category of the ODRC Green Building Standards:

0	0	0	Water Quality & Efficiency	15
Y			Credit Verify Water Quality Indicators	Required
Y			Credit Meet Chemical Thresholds	Required
Y			Credit Meet Thresholds for Organics and Pesticides	Required
Y			Credit Monitor Chemical and Biological Water Quality	Required
Y			Credit Implement Legionella Management Plan	Required
Y			Credit Outdoor Water Use Reduction	Required
Y			Credit Indoor Water Use Reduction	Required
Y			Credit Building-Level Water Metering	Required
Y			Credit Ensure Drinking Water Access	Required
			Credit Meet Thresholds for Drinking Water Taste	1
			Credit Assess and Maintain Drinking Water Quality	3
			Credit Promote Drinking Water Transparency	1
			Credit Design Envelope for Moisture Protection	1
			Credit Design Interiors for Moisture Management	1
			Credit Implement Mold and Moisture Management Plan	2
			Credit Enhance Bathroom Accommodations	1
			Credit Support Effective Handwashing	1
			Credit Implement Safety Plan for Non-Potable Water Capture and Reuse	2
			Credit Cooling Tower Water Use	2

1.17 – The Point Breakdown of ORDC Green Building Standard Certification Levels:

0	0	0	TOTALS	Possible Points: 435
			Certified: 200-249, Bronze: 250-299, Silver: 300-349, Gold: 350-400, Platinum: 400-435	

Appendix 2: LEED and WELL Checklists

2.1 - LEED version 4 for Building Design and Construction (BD+C):

			Cred	Integrative Process	1
0	0	0	Location and Transportation		16
			Cred	LEED for Neighborhood Development Location	16
			Cred	Sensitive Land Protection	1
			Cred	High Priority Site	2
			Cred	Surrounding Density and Diverse Uses	5
			Cred	Access to Quality Transit	5
			Cred	Bicycle Facilities	1
			Cred	Reduced Parking Footprint	1
			Cred	Green Vehicles	1
0	0	0	Sustainable Sites		10
			Cred	Construction Activity Pollution Prevention	Required
			Cred	Site Assessment	1
			Cred	Site Development - Protect or Restore Habitat	2
			Cred	Open Space	1
			Cred	Rainwater Management	3
			Cred	Heat Island Reduction	2
			Cred	Light Pollution Reduction	1
0	0	0	Water Efficiency		11
			Cred	Outdoor Water Use Reduction	Required
			Cred	Indoor Water Use Reduction	Required
			Cred	Building-Level Water Metering	Required
			Cred	Outdoor Water Use Reduction	2
			Cred	Indoor Water Use Reduction	6
			Cred	Cooling Tower Water Use	2
			Cred	Water Metering	1
0	0	0	Energy and Atmosphere		33
			Cred	Fundamental Commissioning and Verification	Required
			Cred	Minimum Energy Performance	Required
			Cred	Building-Level Energy Metering	Required
			Cred	Fundamental Refrigerant Management	Required
			Cred	Enhanced Commissioning	6
			Cred	Optimize Energy Performance	18
			Cred	Advanced Energy Metering	1
			Cred	Demand Response	2
			Cred	Renewable Energy Production	3
			Cred	Enhanced Refrigerant Management	1
			Cred	Green Power and Carbon Offsets	2
0	0	0	Materials and Resources		13
			Cred	Storage and Collection of Recyclables	Required
			Cred	Construction and Demolition Waste Management Planning	Required
			Cred	Building Life-Cycle Impact Reduction	5
			Cred	Building Product Disclosure and Optimization - Environmental Product Declarations	2
			Cred	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
			Cred	Building Product Disclosure and Optimization - Material Ingredients	2
			Cred	Construction and Demolition Waste Management	2
0	0	0	Indoor Environmental Quality		16
			Cred	Minimum Indoor Air Quality Performance	Required
			Cred	Environmental Tobacco Smoke Control	Required
			Cred	Enhanced Indoor Air Quality Strategies	2
			Cred	Low-Emitting Materials	3
			Cred	Construction Indoor Air Quality Management Plan	1
			Cred	Indoor Air Quality Assessment	2
			Cred	Thermal Comfort	1
			Cred	Interior Lighting	2
			Cred	Daylight	3
			Cred	Quality Views	1
			Cred	Acoustic Performance	1
0	0	0	Innovation		6
			Cred	Innovation	5
			Cred	LEED Accredited Professional	1
0	0	0	Regional Priority		4
			Cred	Regional Priority: Specific Credit	1
			Cred	Regional Priority: Specific Credit	1
			Cred	Regional Priority: Specific Credit	1
			Cred	Regional Priority: Specific Credit	1
0	0	0	TOTALS		Possible Points: 110
Certified: 40 to 49 points, Silver: 50 to 59 points, Gold: 60 to 79 points, Platinum: 80 to 110					

2.2 - WELL Certification v2 scorecard:

SOUND			
Y	?	N	
			<input type="checkbox"/> P SOU Sound Planning
			<input type="checkbox"/> SMP Community Sound Mapping
			<input type="checkbox"/> PLN Planning for Acoustics
			<input type="checkbox"/> ORD Noise Ordinance
			<input type="checkbox"/> NLV Noise Level Limit
			<input type="checkbox"/> HEA Hearing Health Education
0	0	0	TOTAL OPTIMIZATIONS

MATERIALS			
Y	?	N	
			<input type="checkbox"/> P HWM Hazardous Waste Management
			<input type="checkbox"/> WST Waste Stream Management
			<input type="checkbox"/> REM Site Remediation and Redevelopment
			<input type="checkbox"/> CRE Construction Remediation
			<input type="checkbox"/> ODS Outdoor Structures
			<input type="checkbox"/> PES Landscaping and Pesticide Use
			<input type="checkbox"/> HAZ Hazard Communication
0	0	0	TOTAL OPTIMIZATIONS

MIND			
Y	?	N	
			<input type="checkbox"/> P AMH Access to Mental Health Services
			<input type="checkbox"/> CRI Mental Health Crisis Support
			<input type="checkbox"/> ABU Substance Abuse and Addiction Services
			<input type="checkbox"/> ARK Substance Abuse and Addiction Services for At-Risk Populations
			<input type="checkbox"/> ALC Alcohol Environment
			<input type="checkbox"/> RDR Responsible Driving
			<input type="checkbox"/> IPV Support for Victims of Interpersonal Violence
			<input type="checkbox"/> SGR Integration of Streetscape Greenery
			<input type="checkbox"/> CHI Outdoor Child Play Spaces
			<input type="checkbox"/> GRE Restorative Green Spaces
			<input type="checkbox"/> BLU Restorative Blue Spaces
			<input type="checkbox"/> BLT Restorative Built Spaces
			<input type="checkbox"/> SCE Preservation of Scenic Views
0	0	0	TOTAL OPTIMIZATIONS

COMMUNITY			
Y	?	N	
			<input type="checkbox"/> P VIS Community Visioning
			<input type="checkbox"/> HIA Health Impact Assessment Screening
			<input type="checkbox"/> HII Health Impact Assessment Implementation
			<input type="checkbox"/> SOC Social Spaces
			<input type="checkbox"/> PUB Public Spaces
			<input type="checkbox"/> SAN Sanitation
			<input type="checkbox"/> CHW Community Health and Well-Being
			<input type="checkbox"/> CHR Community Health Resilience
			<input type="checkbox"/> PRI Access to Primary Health Care
			<input type="checkbox"/> EDU Educational Opportunity
			<input type="checkbox"/> HOU Fundamental Housing Quality
			<input type="checkbox"/> EQU Housing Equity and Affordability
			<input type="checkbox"/> DIG Digital Connectivity
			<input type="checkbox"/> ENG Civic Engagement
			<input type="checkbox"/> PRE Preservation and Rehabilitation
			<input type="checkbox"/> CEL Celebration of Place
			<input type="checkbox"/> ART Public Art
			<input type="checkbox"/> SAF Community Confidence
			<input type="checkbox"/> POC Post-Occupancy Surveys
0	0	0	TOTAL OPTIMIZATIONS

INNOVATION			
Y	?	N	
			<input type="checkbox"/> GND Green Rating Systems
			<input type="checkbox"/> INP Planning for Health
			<input type="checkbox"/> INV Innovate WELL
			<input type="checkbox"/> WLP WELL Accredited Professional
0	0	0	TOTAL OPTIMIZATIONS

CERTIFIED BUILDINGS			
#REF!			Points from health/wellness certified buildings (max 30)
#REF!			Points from green certified buildings (max 10)
#REF!			TOTAL POINTS FROM CERTIFIED BUILDINGS (MAX 30)

AIR			
Y	?	N	
			<input type="checkbox"/> P AQU Fundamental Air Quality
			<input type="checkbox"/> SMK Smoking Ban
			<input type="checkbox"/> SMO Outdoor Smoking Ban
			<input type="checkbox"/> LTA Long-Term Air Quality
			<input type="checkbox"/> LTE Enhanced Long-Term Air Quality
			<input type="checkbox"/> STA Short-Term Air Quality
			<input type="checkbox"/> STE Enhanced Short-Term Air Quality
			<input type="checkbox"/> SEP Pollution Source Separation
			<input type="checkbox"/> PRK Parking Restrictions
			<input type="checkbox"/> LEV Low Emission Vehicles
			<input type="checkbox"/> AED Air Quality Education
0	0	0	TOTAL OPTIMIZATIONS

LIGHT			
Y	?	N	
			<input type="checkbox"/> P LMP Lighting Master Plan
			<input type="checkbox"/> LCS Lighting Control Schedule
			<input type="checkbox"/> EMI Community-wide Emittance Caps
			<input type="checkbox"/> LCT Obtrusive Light Control
			<input type="checkbox"/> LTR Light Trespass Mitigation for Sleep
			<input type="checkbox"/> SVI Visibility Facilitation
			<input type="checkbox"/> RLI Right-Of-Way Lighting
			<input type="checkbox"/> LEX Lighting for Exteriors
			<input type="checkbox"/> MLI Mass Transit Lighting
0	0	0	TOTAL OPTIMIZATIONS

WATER			
Y	?	N	
			<input type="checkbox"/> P WQT Drinking Water Quality
			<input type="checkbox"/> WAD Public Water Additives
			<input type="checkbox"/> PWT Periodic Water Quality Testing
			<input type="checkbox"/> WQD High Quality Drinking Water
			<input type="checkbox"/> WAC Drinking Water Access
			<input type="checkbox"/> FAC Sanitary Facilities Provision
			<input type="checkbox"/> WFS Water Feature Sanitation
			<input type="checkbox"/> LEG Legionella Control
			<input type="checkbox"/> SWA Stormwater Management
			<input type="checkbox"/> OVF Overflow Water Management
0	0	0	TOTAL OPTIMIZATIONS

MOVEMENT			
Y	?	N	
			<input type="checkbox"/> P MIX Mixed-Use Development
			<input type="checkbox"/> MNP Movement Network Planning
			<input type="checkbox"/> WAK Walkability
			<input type="checkbox"/> PED Pedestrian-Scale Design
			<input type="checkbox"/> PDS Enhanced Pedestrian Environments
			<input type="checkbox"/> CYC Cyclist Infrastructure
			<input type="checkbox"/> BPK Bicycle Parking
			<input type="checkbox"/> CYS Enhanced Cyclist Environments
			<input type="checkbox"/> BSH Community Bicycle Share
			<input type="checkbox"/> TRA Mass Transit Infrastructure
			<input type="checkbox"/> TRN Mass Transit Support
			<input type="checkbox"/> WAY Community Wayfinding
			<input type="checkbox"/> PAS Physical Activity Spaces
			<input type="checkbox"/> PRG Activity Programming
			<input type="checkbox"/> PET Pet Support
0	0	0	TOTAL OPTIMIZATIONS

NOURISHMENT			
Y	?	N	
			<input type="checkbox"/> P SUP Supermarket Access
			<input type="checkbox"/> FRU Fruits and Vegetables
			<input type="checkbox"/> HFO Healthy Food Procurement
			<input type="checkbox"/> FAD Food Advertising
			<input type="checkbox"/> NED Nutrition Education
			<input type="checkbox"/> AGR Urban Agriculture I, Provision
			<input type="checkbox"/> AGP Urban Agriculture II, Promotion
			<input type="checkbox"/> FAF Food Affordability
			<input type="checkbox"/> FSE Food Security
			<input type="checkbox"/> FSA Public Food Inspection Information
			<input type="checkbox"/> BRE Breastfeeding Support
0	0	0	TOTAL OPTIMIZATIONS

THERMAL COMFORT			
Y	?	N	
			<input type="checkbox"/> P EXT Extreme Weather Warnings
			<input type="checkbox"/> HET Urban Heat Adaptation: Community Support
			<input type="checkbox"/> HPE Urban Heat Adaptation: Public Education
			<input type="checkbox"/> CLD Urban Cold Adaptation: Community Support
			<input type="checkbox"/> CPE Urban Cold Adaptation: Public Education
			<input type="checkbox"/> HIM Urban Heat Island Mitigation
			<input type="checkbox"/> VEG Urban Vegetation and Green Spaces
			<input type="checkbox"/> WAT Urban Water Bodies
			<input type="checkbox"/> SUN Personal Sun Exposure
0	0	0	TOTAL OPTIMIZATIONS

Appendix 3: JadeTrack Data

3.1 - Screen capture of excel sheet detailing utility cost per square foot and per individual, as well as averages, range of significance, standard deviation, and standard error. The image also shows the site EUI for each of the facilities as shown on JadeTrack:

Name	Year Built	Site EUI	Pop	Sq Ft	Water	Electricity	Nat Gas	Waste	Water	Electricity	Nat Gas	Waste	Total
Allen Oakwood Correctional - AOCI	1988	240.3	1,525	548,354	1.67	0.89	0.51	0.15	642.46	343.38	196.81	59.42	1245.29
Belmont Correctional - BeCI	1995	170.6	2,025	410,258	1.33	1.69	0.49	0.18	220.19	279.73	81.22	29.14	613.97
Chillicothe Correctional - CCI	1929	192.1	2,343	773,491	1.48	0.93	0.8	0.13	497.77	314.28	269.59	42.34	1127.32
Correctional Reception Center - CRC	1987	106.6	1,655	464,435	1.72	0.86	0.45	0.16	533.9	266.47	140.58	48.73	992.87
Dayton Correctional - DCI	1987	356.8	695	267,172	0.59	1.08	0.43	0.18	223.89	408.32	164.11	69.91	868.51
Grafton Correctional - GCI	1988	143.2	1,683	416,995	2.75	1.5	0.6	0.17	736.41	402.38	159.94	45.65	1349.4
Lebanon Correctional - LeCI	1960	153.7	3,384	526,463	0.46	0.77	0.66	0.11	132.44	222.08	188.99	32.07	577.58
London Correctional - LoCI	1924	121.2	1,800	847,933	1.44	0.59	0.41	0.09	596.65	245.13	169.18	36.72	1050.21
Lorain Correctional - LorCI	1990	87	1,029	467,919	0.49	0.84	0.3	0.15	220.09	376.64	135.7	67.51	801.72
Madison Correctional - MaCI	1966	180.8	1,656	549,495	1.54	0.61	0.6	0.14	438.69	172.54	169.25	41.07	824.44
Mansfield Correctional - ManCI	1990	137.5	2,438	578,499	0.98	0.97	0.64	0.21	251.99	251.45	166.07	54.34	726.65
Marion Correctional - MCI	1957	180.6	1,994	586,632	1.79	0.72	0.59	0.08	472.07	190.97	155.42	19.76	841.4
Noble Correctional - NCI	1996	133.3	4,682	385,712	2.01	1.45	0.46	0.23	334.48	245.36	78.33	38.78	701.1
Northeast Reintegration - NERC	1988	117.2	449	148,314	1.11	1.18	0.44	0.15	443.81	468.01	176.35	58.76	1149.81
Ohio Reformatory for Women- ORW	1951	116.2	2,109	615,426	1.56	0.72	0.42	0.27	436.29	201.03	116.43	76.13	832.85
Ohio State Penitentiary - OSP	1998	83	432	487,102	0.24	0.92	0.24	0.1	249.84	969	253.81	101.53	1575.68
Pickaway Correctional - PCI	1984	118.9	1,778	594,620	2.81	1.5	0.4	0.14	969.86	517.96	137.04	47.26	1676.97
Richland Correctional - RiCI	1998	153.8	2,508	376,950	4.07	1.34	0.64	0.37	632.72	208.6	98.89	56.88	1003.51
Ross Correctional - RCI	1987	126	1,940	576,365	1.45	0.85	0.5	0.15	492.29	290.35	169.59	51.33	1006.51
Southeastern Correctional - SCI	1980	171.8	1,406	465,751	1.16	0.69	0.63	0.1	385.56	231.66	208.75	32.58	861.13
Southern Ohio Correctional - SOCF	1972	153.5	1,120	878,660	0.04	0.55	0.54	0.09	27.98	427.64	415.44	67.52	939.8
Toledo Correctional - ToCI	2000	147.9	636	477,741	0.81	1.08	0.41	0.08	511.13	678.01	254.98	51.35	1497.85
Trumbull Correctional - TCI	1992	155.8	1,444	367,050	1.22	0.97	0.69	0.15	344.53	273.84	195.55	42.23	859.18
Warren Correctional - WCI	1989	140.7	953	348,936	0.32	0.66	0.58	0.22	103.8	213.1	185.68	69.72	574.08
Averages		153.6875			1.376667	0.973333	0.517917	0.158333	412.4517	341.5804	178.6542	51.69708	987.4096
Range (+/-)		21.71479			0.356974	0.125415	0.050938	0.026145	85.22752	70.54079	27.54784	7.026943	
ST DEV		54.28696			0.892434	0.313537	0.127344	0.065362	213.0688	176.352	68.8696	17.56736	
St Error					0.178487	0.062707	0.025469	0.013072	42.61376	35.2704	13.77392	3.513472	
Median EUI		145.55											

3.2 - Partial screencap of the EnergyStar report on median site EUI. The value for prison/incarceration is highlighted.

Broad Category	Primary Function	Further Breakdown (where needed)	Source EUI (kBtu/ft ²)	Site EUI (kBtu/ft ²)	Reference Data Source - Peer Group Comparison
Healthcare	Ambulatory Surgical Center		138.3	62.0	CBECs - Outpatient Healthcare
	Hospital	Hospital (General Medical & Surgical)*	426.9	234.3	Industry Survey
		Other/Specialty Hospital	433.9	206.7	CBECs - Inpatient Healthcare
		Medical Office*	121.7	51.2	CBECs - Medical Office
		Outpatient Rehabilitation/Physical Therapy	138.3	62.0	CBECs - Outpatient Healthcare
		Residential Care Facility	213.2	99.0	Industry Survey
		Senior Living Community*	213.2	99.0	Industry Survey
	Urgent Care/Clinic/Other Outpatient	145.8	64.5	CBECs - Clinic/Outpatient	
Lodging/Residential	Barracks*		107.5	57.9	CBECs - Dormitory
	Hotel*		146.7	63.0	CBECs - Hotel & Motel/Inn
	Multifamily Housing*		118.1	59.6	Fannie Mae Industry Survey
	Prison/Incarceration		156.4	69.9	CBECs - Public Order and Safety
	Residence Hall/Dormitory*		107.5	57.9	CBECs - Dormitory
	Residential Care Facility		213.2	99.0	Industry Survey
	Senior Living Community*		213.2	99.0	Industry Survey
	Single Family Home		N/A	None Available	
	Other - Lodging/Residential		143.6	63.6	CBECs - Lodging

Appendix 4: Survey Administered to Horticulture Class and Green Team at ODRC

This survey is part of an on-going research project conducted by students within the School of Environment and Natural Resources at The Ohio State University. Results of this survey will guide further research on the creation of a green building standard within ODRC facilities.

(Term Question) How long have you been an occupant of ODRC _____

How long is your expected occupancy? _____

1. Rate these livelihood aspects from "1" to "12." "1" being most important to you and "12" being least important to you.

- ___ Air Quality
- ___ Clean Water
- ___ Healthy Food
- ___ Facility Lighting (e.g. how much the lighting may overwhelm you)
- ___ Opportunity for Physical Activity (e.g. walking, exercise, etc.)
- ___ Green spaces (e.g. access to green spaces and the quality of green spaces)
- ___ Noise Management (e.g. the volume of noise)
- ___ Communication of safety hazards (is personal health and safety prioritized)
- ___ Mental health services (how does your environment contribute to occupant mental health)
- ___ Healthy Community and community engagement (within ODRC facilities and among residents)

Please provide any further reasoning for these ratings.

2. Rate each aspect from "0" to "100." "0" meaning non-existent actions to achieve such standards and "100" meaning that the standards are fully sufficient.

- ___ Air Quality
- ___ Clean Water
- ___ Healthy Food
- ___ Facility Lighting (e.g. how much the lighting may overwhelm you)
- ___ Healthy Food

- ___ Opportunity for Physical Activity (e.g. walking, exercise, etc.)
- ___ Green spaces (e.g. access to green spaces and the quality of green spaces)
- ___ Noise Management (e.g. the volume of noise)
- ___ Communication of safety hazards (is personal health and safety prioritized)
- ___ Mental health services (how does your environment contribute to occupant mental health)
- ___ Healthy Community and community engagement (within ODRC facilities and among residents)

What would increase your rating for specific aspects?

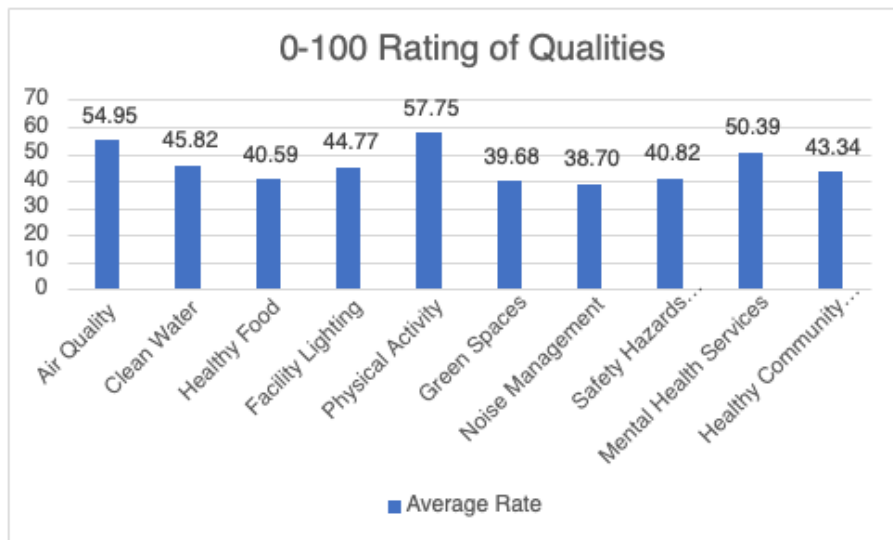
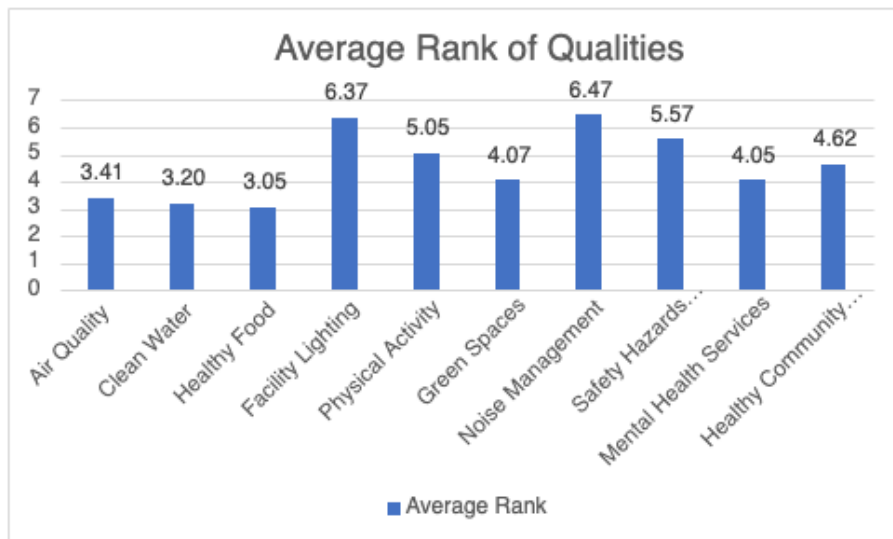
3. From these aspects above, what would you like to learn more about through formal learning programs?

4. Please list what learning programs you have participated in with ODRC.

- 5. Do you believe these programs have helped you be more thoughtful in your day to day living experience? _____(YES/NO)
- 6. Do you believe these programs have helped foster a sense of community within ODRC facilities? _____(YES/NO)
- 7. Please provide any suggestions that would benefit your living experience outside of previously mentioned categories

Appendix 5: Survey Responses from ODRC Incarcerated Individuals

5.1 - Charts of Quantitative Survey Responses



5.2 - Quantitative Results of First and Second Round Survey

	Air Quality	Clean Water	Healthy Food	Facility Lighting	Opportunity for Physical Activity	Green Spaces	Noise Management	Communication of Safety Hazards	Mental Health Services	Healthy Community and community engagement
Question 1										
Horticulture Class Average	2.96	2.74	2.72	5.63	4.11	4.07	5.26	4.33	3.93	4.26
Green Team Average	3.41	3.20	3.05	6.37	5.05	4.07	6.47	5.57	4.05	4.62
Average of all Surveys	3.19	2.97	2.88	6.00	4.58	4.07	5.86	4.95	3.99	4.44
Question 2										
Horticulture Class Average	34.75	40.38	25.67	44.08	48.50	39.83	40.75	38.04	42.29	39.38
Green Team Average	54.95	45.82	40.59	44.77	57.75	39.68	38.70	40.82	50.39	43.34
Average of all Surveys	44.85	43.10	33.13	44.43	53.13	39.76	39.73	39.43	46.34	41.36