

Control Analysis of Norman Public Library Central

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INTRODUCTION AND PROBLEM

The Norman Public Library system recently built a new library in central Norman, Oklahoma to replace the old one. The new Norman Public Library Central shifted sites from south of Andrews Park to north of Andrews Park which allowed the library to maintain centrality in Norman near other community spaces like the police station, a post office, the Downtown Norman area, and the park with amenities such as walking and biking paths, an amphitheater, a skate park, and areas to play sports or spend leisure time outdoors. The new library was built by MSR Design and opened in the fall of 2019 (Reiger, 2020). Shortly after opening, the library closed due to COVID-19. Now, with the building reopened, visitors are free to come and go. Libraries are commonly found all over the United States and have shifted from places for housing books to places for local gatherings, places to read, study, conduct research, use local computers, and still places to learn. Because of their common functions, libraries sometimes act as an extension of a school for students to conduct research, meet for group projects, or use technologies not accessible in any other place. Libraries have an opportunity to utilize many different indoor control and technology systems to assist user functions and to improve the health, safety, and welfare of the visitors.

METHODOLOGY

A mix of primary and secondary data were gathered to for this study. Primary data included observations performed by the researcher on multiple days throughout the month of April in 2021 and a thorough analysis of their findings. Observation periods lasted anywhere from one to two hours. Secondary data included articles written by the design firm that built the library and other articles that highlighted the new project. These articles were found by searching the library on Google and then using links in the articles which led to more information about the

library build and design choices for the library. Qualitative methodologies were used in all circumstances.

RESEARCH

Many different indoor controls and technologies were identified in the library, as well as a few outdoor controls. These controls include lighting, acoustics, air quality, furniture selection and arrangement, material use, security, stormwater management, outdoor planting, COVID-19 measures, and returns on investment. Observations also included different user types and traffic, both indoor via people and outdoor via automobiles. Observations were recorded in the form of digital notes, which can be found in Appendix A.

Building use analysis

The hours of operation are Monday through Thursday from 9 am to 9 pm, Friday from 9 am to 8 pm, Saturday from 9 am to 5 pm, and Sunday from 1 pm to 6pm. The people who use the building are library staff, students, small family units, homeless people, people doing homework (like me), and some individuals browsing books. Traffic in this area has always been relatively light compared to immediate surrounding streets, but since the library has been built, traffic has increased. Typically, there are 3-5 cars using the road at the same time. This number increases when stopped by a train. A few students also use this area as a pickup place for their parents.

The library contains several rooms for community or private meetings as well as a meeting area solely for children and family use. Hopefully, these rooms will get more use once COVID-19 issues decline and the public feels comfortable using the spaces provided. On the first floor, there is a small bookshop. From observations, the bookshop appears to be old books from the library itself.

Indoor and Outdoor Lighting

The lighting inside is at a neutral level- not too dark and not excessively bright. The space relies heavily on the curtain walls for light. The east side of the building is made up mostly of curtain walls. To prevent the sun from beating down into the space, a glazed coating was attached to the windows. This glazing is hardly noticeable and does not disrupt views to the outdoors. On the first floor in the children's section are clerestory windows to allow some northern light into the space.

Throughout the library, there are several window box areas with different seating options to provide seclusion but also to give users views to the outdoors. However, during the observation period for the study, Norman was experiencing a rain season. In many places throughout the building, several small trashcans were scattered around to collect rainwater from leaks. There were also black trash bags along the curtain walls to cover a few leaking areas. Many of the above mentioned window boxes were blocked off with caution tape because of the leaking issues.

On the ceiling, there are skinny and long troffers, cove lighting, and a few can lights. The longer troffers serve as the main lighting over the bookshelves, but they also add interest to the space. The cove lighting is used to highlight architectural features and to define different areas within the library as most of the space is open concept. The can lights are strategically placed to highlight different artwork or areas of interest. In the workrooms, there are hanging troffers. The main stairwell uses lighting to create interest as well. Here the lighting is very angular and in a seemingly random arrangement. The lights in the restrooms are automatic, so after a certain amount of time not being used, they will turn off.

Acoustics

The acoustics in the main first floor area are not conducive for studying or reading. Many of the surfaces in this area are made of hard materials. The area is also high in foot traffic because it has the entrance, computer area, community shop, and children's area located in it. Most of the furniture in this area is made of hard materials as well except for a few seats next to some of the computer stations. However, once in the children's area, the acoustics improve. This area has lower ceilings and softer materials like carpet flooring, acoustic ceiling tiles, and soft furniture.

The acoustics on the second and third floors are at a comfortable study and reading level. The ceiling tiles are acoustical, and carpet flooring further soaks up extra noise. There are floor air vents next to the curtain walls that generate white noise. There is enough background sound to not feel extremely silent, but also peaceful enough to feel private and an area where you could study or read. The trains passing by are heard but are not a great disturbance sound wise. The trains contribute further to the white noise. However, when the trains pass by, the third floor vibrates a small amount, which could be slightly distracting.

Air Quality

Air quality appears to be well. Throughout all floors there are floor air vents that can be opened and closed depending on the user's preference. There are no unpleasant odors or smells at the time of the observations. This may partially be due to the requirements of wearing masks. Thermal comfort was neutral. Thermostats read 70 degrees. The humidity levels were also good. On rainy days it does not feel humid inside.

Furniture Selection and Arrangement

The first floor entry area has limited furniture. A small section near the south entrance has some hard seating options in the form of café style tables and chairs. The first floor entrance

area also had a few scattered window seats. In the computer section of the first floor, there were ergonomic chairs located at each computer. Some soft chairs were also provided next to a few of the computer stations. In the children's area, there were many soft seating groups that overlooked the bookshelves. These would be great to be used by parents or guardians waiting for children to make book selections. Some soft seating for children was also provided in the window nook areas. The meeting room in the children's section had a variety of fun and enticing seating options for children. However, during every visit this room was not in use, so it is unclear how the children interacted with this space.

On the second floor, there were mostly 2-4 person seating groups. Within the bookshelves area, the chairs were faced towards the curtain walls. The tables are coffee table height, more for reading or lounging rather than doing work. There were also a few tables that doubled as bookshelves. Visitors could pull out the stools and sit on them, but during one observation it was noticed that one elderly lady standing at the table reading rather than sitting. There were a few computers that were also at lower height tables with short stools, as well as some collaboration tables similar. There is a bar around the main stairs, but because of COVID-19, there was limited seating in that area. This made that area less used because sitting there would make a person feel exposed and out of place. At the east end of the second floor are a few tall tables to sit at on tall stools. On the east wall are private workrooms that are open to the public. These rooms contain a table, television, and four chairs. The area could be used for group meetings or isolated study or work time. Near the stairs were nooks to add another variety of seating. This area was closer to booth seating. A small table was provided in this space, but the table barely came above the seat cushion, so pulling it close to do work from was not an option.

The third floor was very similar to the second floor. All the same furniture typologies

could be found in this space with an additional outdoor area and traditional library section. The small outdoor area contained four tables and multiple chairs at these table. While the area was covered, it was not pleasant to use during rainy weather. The traditional library section housed Oklahoma history books as well as genealogy books for research. This area had old wooden tables and traditional chairs commonly found in older libraries particularly on university campuses.

Material Use

In the entrance area of the library, a tile flooring covers the ground. The walls are a dark grey brick material, and the back wall is a warm wood. Clerestory windows line the west wall as well. The ceiling is a metal sheet with a linear design. The main stairwell is wrapped in a similar metal. The main stairwell also serves as learning stairs that are made with the same warm wood seen on the back wall. One small seating area is carpeted to define a separate space.

The children's section is carpeted with acoustic ceiling tiles. The walls are a mix of painted gyp and curtain walls. This area of the first floor is much softer than the entrance area and creates a more inviting and safer environment for the children.

On the second floor the flooring is carpet tiles and interior walls are gyp. A brick material defines an emergency stairwell. 3-form is used in one section to define boundaries of an informal meeting space. Paint is used minimally to highlight a feature wall with library history on it. The outside walls are mainly curtain walls that overlook downtown Norman. The ceiling is mainly ACT with a few drop-down gyp areas. It also undulates in form, which creates more interest and movement within the space. There is a gyp perimeter ceiling that signals more private areas.

The third floor is very similar to the second floor. It also has acoustical ceilings, glass curtain walls, and the brick material highlighting the stairwell. In addition, the third floor

Oklahoma history and genealogy area is made of a warm colored wood. The wood assists with acoustics in that area and creates a defined, private space that feels established and calming.

Security and Safety

In the entrance of the library is a central reception area that has a clear view of both the north and south entrances. The nearby computer space also has a manned reception area that works as a secondary security point. In the children's area, there is another librarian working the check-out desk as well as a staff member in an office with a window view of the children's bookshelves. On the second and third floors, there are more reception librarian areas that have views of most of the space.

Many tag readers are used to separate non-public areas from the rest of the library. There are cameras mounted on the ceilings. Standard fire alarm systems are in place, and for safety measures, many exit signs can be easily located throughout the space. There is one large main staircase, and at least two other staircases that could be accessed by the public in case of an emergency.

Stormwater Management

The Pioneer Library System also employed Ten X Ten Studio to design all the landscaping of the site. As part of the landscaping plan, Ten X Ten Studio included a stormwater management system as part of the efforts to become LEED Silver certified (Ten X Ten Studio, 2020). This stormwater system includes bioswale medians, a green roof, and created wetlands that serve as passive irrigation areas. The bioswale medians are found throughout the parking lot area. The green roof is located above the first floor children's area and can be viewed from the second and third floor southern windows. The created wetlands are found throughout the property and are filled with native Oklahoman plants (Ten X Ten Studio, 2020). These passive

outdoor controls help guide stormwater to be used in a positive way that ultimately gives back to the beauty of the site.

Outdoor Planting

As mentioned above, a green roof was incorporated into the design of the space. The green roof not only gives green square footage back to the space, but it also speaks to the inspiration of the building: the prairie lands and plateaus found throughout Oklahoma (Ten X Ten Studio, 2020). In addition, all the plants found on the site are native to Oklahoma and speak to the resilience of the Oklahoma landscapes (Ten X Ten Studio).

COVID-19 measures

The library controls to support healthy practices include propping open doors, touchless bathroom accessories, removal of some seating, a mask requirement, visible hand sanitizer locations, and asking users to limit their stay to one hour or less.

Return on Investment

While aesthetics may not be an explicit indoor control, well executed design choices can encourage visitors to continue to return to the library and could encourage them to use the provided study and community spaces in the future, thus boosting the local use and awareness of the library. Particularly, the sculpture outside the entrance of the building draws people into the space. The sculpture was done by Paul Cocksedge and is entitled “Unbound” (MSR Design, 2021). It mimics pages from a book exploding into the air. Another aesthetic choice was the grand learning stairs in the entrance of the building. They also provide large group seating where a small lecture could occur. Third, the design choices in the children’s area will keep the children wanting to come back. In this area, the scale of the space is shifted down to match that of children. The reading nooks are climbable and feel like personal caves for the children to

explore. In addition, the carpet pattern is interesting and colorful, which would further draw in the attention of the children.

Throughout all the bookshelves are updated technologies that allow visitors to look up different books that may be of interest to them. There are also self-checkout stations that allow for a streamlined process of entering and exiting the library. These added systems not only reduce touch in the time of virus-conscious people, but it also typically allows for better user experiences. If the visitors are not comfortable using the self-checkout, there are still stations that are manned by the library staff.

DESIGN RECOMMENDATIONS

While this library is more up-to-date with design features than older buildings, there are still some things that could be done to increase user wellbeing within the space. Firstly, adding explanations of design features goes a long way because it educates the users on the space they are interacting with. When this is successfully executed, users become more knowledgeable on how to use the space to its full potential. Secondly, the building is currently pursuing LEED Silver certification. To fully enhance the wellbeing of the users, it is also recommended to pursue WELL standards because the WELL standards are focused on the wellbeing of the occupants in addition to the sustainability of the site.

It is clear from observation that the curtain walls used on most of the east and south façade have a leaking issue. This was very evident on the first and second floors. Since this is a newer building, it seems that the glass was either not installed properly or incurred some damages. Either way, the architects and contractors should be notified of this issue.

Technical controls are not highlighted throughout the space, but evidence of them can be seen. On the third floor, there is a visible light switch that allows the staff to control the lighting

from one location. The ease of fitting all the controls in one area can encourage staff members and general lighting practices to reduce energy wasted in the space. Another lighting control source was motion censored lights. However, these only appeared to be used in the restrooms. Using these in other areas of the building could reduce wasted energy.

While it is likely that the air inside the library was clean and free of anything harmful, there was no way to tell. Again, highlighting different controls used in the building could inform occupants on these issues and help put their minds to ease. In fact, if it is something the occupants had never considered before, it could encourage them to return to the space.

In general, the furniture selections throughout the space were up-to-date and it is clear the designers considered many different seating postures in the design. In addition to these small furniture groupings, the space could add mobile working stations. These stations could include moveable marker boards, mobile television stands, more outlet poles, and other innovative furniture to encourage collaboration. Becoming a community center was one of the goals for the new library, so this seems like an appropriate addition (MSR Design, 2021).

MSR Design mentions in their brief about the building design that the upper two floors have been positioned to maximize sunlight harvesting. However, there is no mention to how this is being harvested and to what benefit. Therefore, it would be in the best interest of the building design to add solar panels to turn the sun into usable energy for the site.

CONCLUSION AND FUTURE OPPORTUNITIES

The new Norman Public Library Central is a well-designed building that utilizes modern indoor controls and technology to enhance the user experience and user wellbeing. As part of the Norman Forward project, the site and building promote sustainability and healthy practices. Limitations to this research included time, accessibility, and equipment limitations. The study

was only conducted in the month of April, so more seasons and climates should be observed. As an observer, the researcher only had access to the public spaces. No data was recorded in staff spaces or spaces that were closed due to COVID-19. Lastly, observational equipment was limited to digital notes and photographs. More sophisticated equipment could measure lighting luminance, temperature consistency, air quality, and if the stormwater draining is functioning as intended.

Future opportunities could be gaining access to the staff areas, measuring quantitative data, conducting interviews or surveys, and determining if the outdoor controls are functioning as intended. In addition, interviews could be conducted with MSR Design and Ten X Ten Studio to understand the full intent of the original building. This could then be compared to how the building is actually functioning. Finally, research should be done to see whether the building is on track to accomplish LEED Silver certification.

CITATIONS

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APPENDIX A

Visit 1: April 14, at 3 pm. I first went to the second floor and found a place to sit down. In my initial glance around the space, there were not many seating options at a comfortable working height. The built in desk around the stairs was void of chairs except for two. The lack of seating made it feel awkward and it felt exposed. The place I ended up seating had a slightly larger table but was still too short to work at comfortably. While I sat here, a father and son were in the area searching for a book. Once they made their selection, they found a self-checkout alcove with ease and were both pleasantly surprised by this addition. Shortly after, a train went by. I wanted to be here when a train came by, so that was great. The noise pollution was surprising low. I had no headphones on, so I could definitely hear it, but it was no louder than buses rolling by on the street. It was more like white noise. This is partially due to the fact that this particular railroad crossing has a no horn sign, and the one right before it is an overpass, so again, no need to blow the horn. This was less of a disturbance than I thought it would be.

Visit 2: April 15, at 11:30 am. I started by walking through the downstairs so I could get a head count of people in the library. I went and got something from the vending machine, so I did not look so weird. There were about 3 people using computers today, mostly elderly people. There was one larger family that walked in right ahead of me and were talking to the receptionist. They were headed for the kid's section. There were probably about 10 of them. I then took the elevator upstairs. There is nothing fancy about the elevator except for it lists what is on

each floor, so you can look at that before determining which floor to go to. I went up to the third floor to use a study room. There was one couple outside in the balcony area. One study room was occupied by an adult and student, and I passed one elderly lady reading a magazine. There was one man here searching for a specific book using that technology. Then there was one more person using the stair alcove that was bench seating. The lady in charge of this area today is way more mobile than the lady yesterday. She keeps walking by me. I may not be able to stay longer than an hour today. I will check the second floor on my way down. There is also one small family of three exploring the research/Oklahoma history area as well as two women in their late 30s early 40s. One of them was showing the other around the library. There have also been two trains that have gone by today. I was again impressed with how little noise they make inside the building. When I had headphones by, if I had not been looking at it, I would have never noticed it was there. Today is an overcast day once again, so I cannot observe any sun factors. However, I did notice today that the east windows have a glazing coat on them, most likely to protect users from the morning sun.

Visit 3: April 26, at 9:30 am. Today walked quickly around the first floor and observed a few janitorial staff finishing their jobs as well as a few maintenance men. I am not sure what they were working on though. There were several family units in the children's area today, at least four different families. This area was buzzing with more activity than usual. The computer lab area was pretty much deserted, there were only two guys working there. The second floor was occupied by staff members who were hanging out

and talking to each other. There were two girls in their 20's parusing books. There was a man most likely in his late 30's sitting in one of the rocking chairs that was angled towards the curtain wall windows. He was reading. There was one woman in one of the study rooms. There was also an older lady looking at books on the shelves. I observed this from one of the small furniture groupings along the curtain wall. While I was working there, two girls who appeared to be in college came and sat at one of the tall tables to work on homework. The third floor was quiet. One lady was working at the librarian counter. There were no people looking at books on this floor. However, there was one mom and her two kids in one of the study rooms and a man in the other study room. Other than that, the place was quiet today. The views to campus were very nice today.