Adaptive Reuse: Creating a State-of-the-Art Collection Storage Facility

The Colorado Springs Pioneers Museum

June 2022
**Introduction**

Collections Management and Stewardship are central to museums’ missions across the country. Institutions, such as the Colorado Springs Pioneers Museum (CSPM), hold collections in the public’s trust and follow industry best practices to care for them. The American Alliance of Museums (AAM) recognizes collections stewardship and management as a core standard in evaluating institutions. A storage facility is an important part of this evaluation, without it; collections can be at risk to agents of deterioration. However, museums experience challenges in finding land or building facilities for their unique collections. Land prices are rising, and construction costs are increasing. With these challenging circumstances, institutions will not be able to build a new facility. Instead, museums will need to investigate existing structures and retrofitting them to the unique needs of their collections. The Colorado Springs Pioneers Museum’s (CSPM) Offsite Collection Storage Facility is one example of a successful adaptive reuse project—transforming a warehouse into a state-of-the-art collection storage facility.

At the base of the Colorado Rocky Mountains, Colorado Springs anchors the Pikes Peak region with nearly 500,000 residents.¹ The history of the region is emblematic of the major themes seen in the American West: Indigenous homelands for many millennia to the present day, vast and scenic landscapes, exploration and empire, conflict and forced removal, resource extraction and environmental degradation, aridity and engineering, and innovation. General William Jackson Palmer—a Philadelphia Quaker, Civil War veteran, and railroad entrepreneur—founded Colorado Springs in 1871. He was inspired by the immense natural beauty of the surroundings and had a vision for a new kind of city that would serve as an antidote to the problems of the industrial age, and avoid the excesses of typical nineteenth-century railroad towns. “My theory for this place,” Palmer wrote in 1871, “is that it should be made the most attractive place for homes in the west — a place for schools, colleges, literature, science, first-class newspapers, and everything that the above imply.” Historians see “Palmer’s fingerprints” nearly everywhere in the earliest days of the community. But from then on, Palmer largely retreated from direct involvement and left the business of the town largely to itself. With 150 years of rich, complex and diverse history, Colorado Springs has a unique story of its own.

Over the past fifty years, Colorado Springs has experienced tremendous population growth. The City of Colorado Springs PlanCOS states how “Colorado Springs could have well over 600,000 people, and El Paso County is expected to be home to almost 1,000,000 people by 2040.” With sustained growth, the city’s landscape has changed significantly including land use. Currently, only 11% of the land is zoned for office, business, and employment use. This limitation creates competition and thus higher costs. By focusing on an adaptive reuse project, the CSPM is able to continue expanding and caring for its extensive collection in a close proximity facility.
The CSPM has a rich history dating back to 1896 when the El Paso County Pioneers Association began collecting artifacts and stories of the Pikes Peak region. In 1937, the collection was placed in a museum, and was deeded to the city of Colorado Springs in 1941. Operating as the Colorado Springs Pioneers Museum, the institution is located in the historic 1903 El Paso County Courthouse and is accredited by the American Alliance of Museums (1992, reaccredited 2004 & 2019) with a mission, “... to build a lasting connection to the Pikes Peak region by preserving and sharing its cultural history.” This mission is accomplished by forging sustaining community partnerships to create innovative exhibits, meaningful educational outreach and in-reach, and professional care of the object and archival collection.

The CSPM’s collection is core to its work and comprises over 70,000 artifacts—ranging from artwork, ethnographic materials, and paleontological specimens—and over 6,000 cubic feet of archival materials, including manuscript collections, photographs, maps, blueprints and ephemera. The institution takes its collection care responsibilities seriously. Stewardship is one of the CSPM’s four core values outlined in its strategic plan, Vision 2023. The CSPM’s Policy Manual also sets the standards for collection storage for the organization. All objects and archival materials are examined for evidence of damage or pest infestation prior to being processed and rehoused for storage. Collection storage areas are regularly inspected, cleaned, and maintained. The Integrated Pest Management Policy includes monitoring all storage and collection areas, tracking any pest activity, and remedying any infestations without the use of harmful pesticides. Although these efforts mitigate risk, the CSPM’s biggest preservation challenge is how both facilities were constructed for other purposes.

The 1903 El Paso County Courthouse, the CSPM’s main facility, is a National Register site consisting of four floors totaling approximately 51,000 square feet. The first floor is used for administration, mechanics, a research library/archives, object processing, collections storage, and exhibit preparation areas. The second and third floors house exhibits, programming space, collection storage, and the restored Division I Courtroom (Image 3). The fourth floor is dedicated to collection storage and bell tower access. Unlike a new facility, institutions in historic structures are required to balance the preservation needs of the building while mitigating the risk to collections. All onsite storage opportunities at the courthouse were maximized to the fullest extent possible without comprising historical structural integrity. Prior to the Sustainable Preservation Project, this location housed fragile artifacts that needed a stable environment.
In 1999, the Colorado Springs Museum Foundation (the Foundation) purchased a 14,000-square-foot offsite storage facility in close proximity to the Museum. The facility consists of two 7,000-square-foot sections which were separately constructed in the 1950s (Building 1) and the 1970s (Building 2) and are now joined by a common wall and door. Since the building’s purchase, the CSPM has worked for more than 10 years to turn this space into a state-of-the-art storage facility. The following excerpt from the General Conservation 2006 report, encapsulates the opportunity and challenges of this adaptive reuse project:

“The warehouse could be a state-of-the-art storage facility if it could be adequately outfitted to meet the needs of the museum. It has enough space to meet immediate needs and still more space can be gained by increasing the efficiency of the storage system. The building further could lend itself to high-density storage by adding compactors to make better use of the floor space. However, the use of the warehouse is limited by its lack of environmental control and its inability to protect collections from dust and pests.”

**HISTORY OF THE OFFSITE STORAGE FACILITY**

Prior to the purchase of the 14,000-square-foot offsite storage facility, the collection was housed in the courthouse and other locations around the city. Staff was concerned about the sustainability of managing collections’ security and care in multiple locations. When the building became available, the Foundation purchased it for the institution. As previously stated, the offsite storage facility was originally two separately constructed buildings joined by a common wall and doorway. Both buildings’ foundations are concrete slabs-on-grade. Six 14’ steel rolling doors

---

2 General Conservation Survey. The project was made possible by a grant provided through a cooperative agreement between the national organizations Heritage Preservation and the Institute of Museum and Library Services. Conservator Carl Patterson of the Denver Art Museum conducted the conservation portion of the assessment (see Appendix 7, report pgs. 16-17; 31-33).
originally provided access for truck deliveries. Building 2 is a prefabricated metal building structure with 2” x 6” infill walls and a stucco exterior. The facility contains three distinct areas: an insulated, heated and air conditioned portion used for Archival storage; an office space and processing area which generally houses new and backlog items; and a heated, high-ceiling warehouse section.

To determine the most critical improvements within the constraints of a small staff and limited budget, the CSPM conducted several architectural and collections assessments and determined to implement the following:

- In 2008, the CSPM Foundation finished paying off the debt to the offsite collection storage facility.
- In 2010, muslin dust covers were added to open shelving to protect artifacts from dust infiltration.
- In 2012, unused garage doors were sealed using spray foam around the parameter of the doors. This minimized windblown dust and pest infestations.
- In 2013, ShelfImage submitted a proposal and bid for compact shelving and space reconfiguration options.
- In 2013, 40% of the fluorescent lighting at offsite storage was replaced, switching from T12 to T8 bulbs and spotlights with LED bulbs.
- In 2013, cracks in masonry and cement floors were sealed with spray foam insulation.
- From 2014 to 2016, the museum conducted a complete inventory of the object collection in Building 2 to: 1) Assess the condition of the collection; 2) Determine the types of objects in the collection that are particularly sensitive to fluctuating temperature and humidity, and 3) Determine the size of the collection to plan for compact shelving.
- In 2016, LED security lighting was installed at the South and East sides of the offsite collection storage building.
- In 2017, after ongoing leaks were observed in the facility, the Foundation Board approved special funds for a new, insulated roof.
- In summer 2018, High Country Windows installed a 3M protective window tint on all exterior windows. This tint protects against light and UV damage but also ensures that if the windows are broken, the glass is held together, thereby increasing the security of the building. Blinds were also added as an additional effort to limit light.
- Also in summer 2018, textile racks were put in place in the office space in Building 2 which currently has both heat as well as air conditioning, thus creating a more stable environment. These textile racks will allow the museum to store 114 single-rolled textiles.
- In fall 2018, several sprinkler heads were replaced to better meet National Fire Protection Agency requirements. A new water gauge was also installed and a new QS&Y control valve to replace an old one that was leaking.
• In winter 2018, CSPM replaced and installed two garage doors with insulated doors and a pest-resistant bottom seal.
• In 2019, new compact shelving was acquired and installed to house its natural history, archaeology, and geology collections. We also received 7 Viking Cabinets from Denver Museum of Natural Science to house a variety of collection materials to expand storage capacity.

Over the past 10 years, these enhancements helped the CSPM improve its storage capacity. However, the poor environmental conditions of the building were a concern. The City of Colorado Springs Facilities and CSPM were limited in managing the temperature and humidity of the building. The CSPM staff utilized dataloggers to track these data points, however; they were not able to identify or address the conditions. City Facilities tend to found problems during routine maintenance which caused delays in finding and addressing the issues. Both the AAM Collections Stewardship and National Park Service Museum Handbook stress the importance of environmental controls for collections in storage. Referring to these best practices and standards, the AAM Site Committee Visit Report in 2019 stated that the lack of environmental controls in the offsite storage facility was a concern, and that “the needed upgrades remain the highest capital priority for the museum and its support organizations as well as the city government.”

The Sustainable Preservation at the Museum Offsite Storage Facility was a transformative project for the CSPM to improve the environmental conditions of the offsite storage facility by installing an efficient HVAC system with central digital controls and low-velocity fans. Generous funding from the National Endowment for Humanities Sustaining Cultural Heritage Collection Grant, the El Pomar Foundation, Inasmuch Foundation, the CSPM Foundation, John Ben Snow Foundation, the Edith Jackson Family Trust, and the Strake Foundation made this project possible.

Sustainable Preservation At the Museum Offsite Storage Facility

The CSPM is a mid-size organization with an operating budget of $1.3 million and a staff of 11 full-time positions and 4 part-time positions. The following staff represented the CSPM team during this project: Matt Mayberry, Museum Director and Project Director, Leah Davis Witherow, Curator of History, Caitlin Sharpe, Registrar, Hillary Mannion, Archivist, Steve Winters, Facilities Technician, Museum Technician, and a Collections Technician. This team has significant experience in collections management and construction projects. However, the CSPM still relied on the expertise of Plant Engineering and City of Colorado Springs Facilities to ensure the correct steps were taken for this project.

First, the three entities collaborated to create the final stamp construction drawings for the RFP bid process. Engineers reviewed the preliminary drawings and addressed several concerns, which included:
  - Re-routing proposed mechanical and ductwork installation to better protect collections and reduce the need to relocate them.
Extended the ductwork to connect Warehouse 3, a small room within Warehouse 2.
- Final design, location, and sizing of low-velocity destratification fans intended to improve environmental stability throughout the structure.
- Completion of demolition, mechanical, electrical, and plumbing plans.
- Working with Pikes Peak Regional Building Department to address specific code requirements related to existing building conditions. This particular item identified a new plumbing requirement (i.e. backflow prevention equipment and floor drain) that needed to be addressed in an acceptable and economical manner.

These drawings were completed in November 2020 and used for the RFP process. The CSPM and the City of Colorado Springs completed its RFP process in early 2021. Colorado Mechanical Systems was awarded the contract in March 2021 with a lower project budget. The CSPM used the opportunity to reevaluate its budget and determine how to effectively use these savings. Funds were reappropriated to provide more support in protecting the collection. A Collections Technician was hired to support the project by caring for, relocating and monitoring the collection during the project. The supply budget was increased to purchase additional 6 mil plastic sheeting, foam, tyvex and plastic to protect both collections being relocated and those left in place.

To prepare for construction, the CSPM collections team assessed the potential impact on artifacts housed in the offsite storage facility. This work included the installation of new compact shelving units that increased the capacity to relocate artifacts that may be vulnerable during construction. The collections staff also determined if collections would be suitable for deaccessioning based on the CSPM’s Collecting Policy. The Registrar identified objects in poor condition at the offsite facility. A collection assistant helped research the provenance of the objects. Objects identified for deaccessioning were presented to the Acquisitions Committee for approval.

The most common danger to museum collections is human interaction, and thus staff handle objects as little as possible. The offsite facility houses the CSPM’s larger collection items, such as furniture, machinery, architectural elements, archeological collections, natural history specimens, sculpture, mining, railroad, agricultural and industrial equipment. These artifacts are more complex to relocate due to their size. No artifacts were damaged during the construction process due to the preventative measures that were put in place.
During the planning process, the CSPM staff encouraged engineers to reevaluate the plans to reduce the number of artifact moves. The collections team assessed the potential impact of the artifacts in the space. Staff secured the collection by using foam, tyvex and plastic and wrapped the shelves in 6 mil plastic sheeting. The sheets protected the collection from potential dust and debris caused by construction.

Artifacts still needed to be moved throughout the process. Objects were relocated to areas not impacted during construction, such as office areas and aisles that were closed off with caution tape. Staff carefully handled every object and tracked its location changes. The CSPM staff is pleased that all of the artifacts remained well cared for and in their current condition.

Colorado Mechanical Systems installed two rooftop units, two new humidification units, 6 de-stratification fans, two new water heaters, 500 feet of ductwork, and isolation valves to the water meter between June – December 2021. Originally scheduled for twelve weeks, the intermitted construction process was caused by the following reasons:

- COVID-19 impacted many industries across the country and the world. During the project, the contractors and subcontractors encountered labor shortages and supply chain delays caused by these unforeseen circumstances.
- When working on an adaptive reuse project, additional unanticipated construction projects might be required. The Engineer and Contractor determined the facility needed more power to accommodate the new system. Berwick Electrical, a subcontractor, installed a new wiring and electrical panels to support the HVAC. Pikes Peak Regional Building and City of Colorado Springs Fire Department both required additional projects to ensure the offsite storage facility was in compliance with building and fire codes. These projects include dilution tanks, fire alarm shutdown alarm system, and isolation values.

*Sustainable Preservation Project at the Museum Offsite Storage Facility* included installing digital controls for the system. Prior to this project, both the CSPM staff and the City of Colorado Springs Facilities were limited in managing the environmental controls. Johnson Controls collaborated with CSPM staff, Plant Engineering, and City Facilities to set goals, install sensor, and design the digital control interface. The setpoints are set a temperature goal of 69 and relative humidity of 35 with some variance allowed. This work allows both the CSPM and City
Facilities to remotely monitor the environmental conditions and alter setpoints as needed. The staff was trained on this system in order to ensure they are able to anticipate problems and more efficiently determine solutions to protect the collection.

Creating a Stable Environment

Colorado Springs is situated in a B5 climate zone; winters are cold and summers are hot. Outside temperature can fluctuate by 50 degrees or more in a 24-hour period. Sudden storms increase the internal humidity by 60% in just a few hours. Damaging flood, hail, wind, and snow have become annual realities in recent years. The region’s average humidity ranges from 40-52%, but it is not unusual for the reading to drop to single digits for extended periods, especially during the winter months.

The CSPM staff utilized data loggers to track the temperature and relative humidity (RH) in the offsite storage facility. These graphs from Winter and Summer 2021 demonstrate how the

![Graph of temperature and humidity over time]

outside environment significantly impacted the facility’s environmental conditions. For Winter 2021, Warehouse 1 (Photo 7) averaged RH of 9 to 26 and temperatures of 63° to 67° F; Warehouse 2 (Photo 8) averaged RH of 12 to 26 and temperatures of 54° to 66° F.
For Summer 2021, Warehouse 1 (Photo 9) averaged RH of 18 to 50 and temperatures of 65° to 72°F, while Warehouse 2 averaged (Photo 10) RH of 20 to 50 and temperatures of 66° to 68°F. As mentioned previously, Colorado encounters sudden storms in both of these seasons. Without climate control, these outside seasonal changes caused the RH and temperatures to significantly fluctuate which is concerning for collections care.
Collections need a stable environment based on the outside environment. The Mountain West and High Desert environment require different averages compared to the southeast. The goal for climate control is to maintain consistency of 60 temperature and 35 relative humidity. Compared to these goals, the offsite storage facility’s environmental conditions were poor and unstable.

The HVAC system went live beginning in December 2021. Between December 2021 and February 2022, the CSPM staff already noticed changes in the building’s environmental conditions as the temperature and humidity started to normalize. Appendix 1 shows the graphs and data for Warehouse 1 and 2 between January 2021 to June 2021 and January 2022 to June 2022.
2022. The fans started distributing the air produced by the new system throughout the entire facility. By providing adequate ventilation throughout the space, the new system minimizes stagnant air pockets which can allow mold and mildew to thrive. The fans also distribute the humidity and different temperatures to help maintain environmental levels. This system also started monitoring and adjusting the climate conditions based on the setpoints defined by the CSPM staff and City Facilities. These changes improved the environmental conditions of the building and are illustrated in the data for Winter and Summer 2022.

During the Winter and Summer 2022 seasons, the data now shows a more gradual change in RH and temperature. For Winter 2022, Warehouse 1 averaged the RH of 26 to 32 and the temperature of 66°F to 69°F (Photo 11); Warehouse 2 averaged the RH of 22 to 28 and a temperature of 70°F (Photo 12). For Summer 2022, Warehouse 1 averaged the RH of 32 to 38 and a temperature of 66°F to 69°F (Photo 13); Warehouse 2 averaged the RH of mid-30s and a temperature of 67. (Photo 14). Based on best practices from AAM and NPS, these readings are closer to traditional environment requirements. Although the seasons still cause fluctuations, they have less of an impact and are more gradual compared to the data for Winter and Summer 2021 data.

![Photo 13- Warehouse 1, May 20 - June 15, 2022](image)
Photo 12 - Warehouse 2, February 15 - March 10, 2022

Photo 8 - Warehouse 2, May 20 - June 15, 2022
Before this project, City Facilities and CSPM were limited in monitoring the building’s environment. Best collection care practices require museum staff to focus their efforts on proactively monitoring storage conditions. Since the offsite storage facility is separate from the main facility, digital controls were listed as a priority in this project. Both groups needed to be able to access the controls from another location. Johnson Controls collaborated with CSPM staff and City Facilities to install the location sets, design the digital control interface, and set up remote access. With the ability to consistently monitor environmental controls, the CSPM and City Facilities can anticipate problems and determine solutions more efficiently in order to continue creating a steady environment.

**The CSPM’s Future**

After 10 years of enhancements, the CSPM Board of Directors and staff feel that the institution is at a critical turning point in its 125-year history. The CSPM wants to attract more visitors by expanding exhibit gallery space and increasing programming activities. This transformative project is moving this vision forward.

In addition to stewardship, storytelling and respect are two of CSPM’s core values outlined in its strategic plan. Both of these values emphasize how the Museum is a community storyteller and how we believe that our community includes multiple perspectives and viewpoints. Guided by these values, the CSPM is committed to developing exhibits and programs that reflect the complexity and diversity of the Pikes Peak region.

To uphold these efforts, the CSPM is collecting more artifacts and archival materials to ensure the collection mirrors our community. However as mentioned previously, both the main courthouse and offsite facility were limited. This adaptive reuse project increased the institution’s storage capacity by 25%. Previously, sensitive materials could not be moved to offsite due to the lack of climate control. Now, materials are able to be moved permanently from the main facility to offsite because of the improved conditions and thus increase the footprint of the courthouse’s storage spaces. The next step would be to install compact shelving in order to improve storage efficiency and future sustainability.

After completing a capital project in the offsite storage facility, the CSPM will be installing an upgraded, energy-efficient HVAC system in the historic 1903 El Paso County Courthouse in the next couple of years. This capital project aims to improve stability in the temperature and relative humidity readings; to increase energy efficiency; enhance the visitor’s experience and to expand exhibit gallery space for the first time since 1979. For this upcoming project, the CSPM staff will be changing its approach by implementing the following strategies in order to ensure the project’s success:
- **Increasing Contingency Budget and Timeline:** Capital Projects are expensive and time-intensive. The *Sustainable Preservation Project* was unique because the proposal was under the original budget, however; the institution still experienced unforeseen costs. In addition, the timeline was significantly delayed due to the intermittent construction work. CSPM staff recommends for other institutions include these contingencies in their planning process.

- **Connecting with Experts:** The CSPM is owned and operated by the City of Colorado Springs. This public-private partnership allows CSPM staff to request for guidance from other departments during this project. For example, City Facilities was part of the project. The City of Colorado Springs Facilities HVAC supervisor, provided insight into the best ways to monitor and track environmental controls. This guidance was critical in the project’s success. When looking into these types of projects, we recommend for institutions to look at their connections. These relationships can help provide guidance in insight into project’s planning and implementation.

- **Protecting Collections:** Due to the savings in the budget, the CSPM was able to increase its fund for its preventative efforts. The CSPM hired a Collections to consistently monitor the collection during the construction process. As mentioned previously, the courthouse is separate from the offsite storage facility. CSPM staff consistently divided their time between the two facilities. By having an experienced position dedicated to this project, the CSPM staff ensured the collection was protected throughout the entire construction process. Additional materials were needed to wrap shelves and artifacts to ensure the collection was protected.

Collection Stewardship is very important to the Colorado Springs Pioneers Museum. By focusing its efforts on adaptive reuse, the institution continues its commitment to preserving its collection for future generations. CSPM Board of Directors and staff believe more institutions will look towards adaptive reuse projects, and will continue work towards our state-of-the-art facility.
APPENDIX 1:

Offsite Storage Facility Temperature and Relative Humidity Data

- Warehouse 1 Data – Prior to HVAC Installation 2021 1 - 2
- Warehouse 2 Data – Prior to HVAC Installation 2021 3 - 4
- Warehouse 1—Post HVAC 2022 5 - 6
- Warehouse 1 – Post HVAC 2022 7 - 8

Staff used environmental data provided by Onset HOBO UX100-023 Temperature and Humidity w/ External Sensor as the new digital controls do not have the same rate of logging. The new controls only log conditions once an hour whereas the Hobo loggers offer a dynamic logging each minute. To see the best comparisons, staff used the same method of recording the environmental conditions. The compared trends vary slightly in terms of dates, but allow us to see general month trends during select times of year. Unfortunately, data is limited as the system has only run since December 2021, so we have only experienced winter and the first part of summer. This summer has also been unusually dry and hot and the winter only had a few days with extremely severe weather. True trends and the overall impact will be more evident once at least a year has passed. To allow for the most direct comparison, staff compared the previous year of 2021 to the current year but have access to data from 2019 and 2020 to have an idea of general environmental trends at offsite prior to the installation of the HVAC.
WAREHOUSE 1 DATA – PRE-HVAC INSTALLATION 2021

Graph 1: January 14, 2021 to February 13, 2021

Temp, 58 to 68, average closer to 62 to 66. RH 11 thru 22

Graph 2: February 15, 2021 to March 17, 2021

Temp, 63 to 67. RH ranged from 9 to 26.
Graph 3: May 1 to May 31, 2021

Temp, 65 to 72, RH 18 - 50, with huge spikes due to weather.

Graph 4: June 1, 2021 to July 1, 2021

Temp 64 to 80, Averaging usually from 72 to 80. RH, 22 to 52, average 25 to 50.
WAREHOUSE 2 DATA—PRE-HVAC INSTALLATION 2021

Graph 1: January 14, 2021 to February 13, 2021

Temp range from 62 to 68, RH from 11 to 17.

Graph 2: February 15 to March 17, 2021

Temp, 54 to 66 with regular spikes down to the lower 60s/upper 50s. RH, 12 to 26.
Graph 3: May 1 to May 31, 2021

Temp, 66 to 68, RH varies from 20 to 50 with significant spikes (up to a high humidity and rapidly back down).

Graph 4: June 1 to July 1, 2021

Temp, 66 to 78, RH 21 to 54 with numerous spikes.
WAREHOUSE 1 DATA – POST HVAC 2022

Graph 1: January 22, 2022 to February 15, 2022

Temp, 66 to 70, RH 22 to 36, closer to 28 to 32 on average.

Graph 2: February 15, 2022 to March 10, 2022

Temp, 65 to 71, but averaging closer to 66 to 69. RH 18 to 36 but averaging closer to 26 to 32.

Graph 3: April 28, 2022 to May 20, 2022
Temp, 65 to 71, but averaging 67 and 69. RH 19 to 42, but mostly averaging from 30 to 38. This month had extremely dry conditions and high heat which impacted humidity, a problem with the humidifier, and a significant snow storm (which spiked the humidity up to 42) so the conditions were impacted by numerous factors.

Graph 4: May 20, 2022 to June 15, 2022

Temp, 65 to 71, averaging 66 to 69. RH, 29 to 47, mostly ranging from 32 to 38. Frequent spikes in RH due to weather.

WAREHOUSE 2 DATA – POST HVAC 2022
Graph 1: January 22, 2022 to February 15, 2022

Temp, 70 to 73, RH 16 to 30, but average closer to 22 to 28.

Graph 2: February 15, 2022 to March 10, 2022

Temp, 68 to 72, averaging 70. There was a range in humidity this month as we the filter needed to be changed on both humidifiers in addition to weather events. RH range from 14 to 31, but averaging closer to 22 to 28.

Graph 3: April 28, 2022 to May 20, 2022

Temp, 70 to 73, RH 16 to 30, but average closer to 22 to 28.
Temp, 66 to 71, averaging 68 to 70. RH 18–39, average closer 28 to 38. This month had extremely dry conditions and high heat which impacted humidity, a problem with the humidifier, and a significant snow storm (which spiked the humidity up to 42) so the conditions were impacted by numerous factors.

Graph 4: May 20, 2022 to June 15, 2022

65 to 71, mostly averaging from 67 to 70, RH from 23 to 50, mostly ranging from 32 to 45 with several periods of time with relative stability in the mid-30s.