



## County Dome and Facility Improvements Study

Prepared for:  
Manitowoc County Department of Public Works  
Manitowoc, Wisconsin

Strang Project #2022011

June 30, 2022

811 East Washington Avenue, Suite 200 | Madison, WI 53703 | 608.276.9200  
W238N1610 Busse Road | Waukesha, WI 53188 | 262.875.6760  
[www.strang-inc.com](http://www.strang-inc.com)



**Table Of Contents**

Table Of Contents ..... i

Executive Summary ..... iii

I. PROJECT OVERVIEW ..... 1

    A. Project Justification ..... 1

    B. Project Team ..... 1

    C. Study Approach ..... 2

    D. Building Description ..... 3

    E. Historical Status ..... 3

    F. Project Schedule ..... 4

    G. Project Budgets ..... 4

II. CONDITION ASSESSMENT ..... 5

    A. Tower Architectural Condition Assessment ..... 5

    B. Interior Dome Architectural Assessment ..... 16

    C. Courthouse Exterior Windows Assessment ..... 18

    D. Limited Mechanical Condition Assessment ..... 20

III. WORK RECOMMENDATIONS ..... 23

    A. Tower ..... 23

    B. Interior Dome ..... 25

    C. Courthouse Windows ..... 26

    D. Heating Plant ..... 26

    E. Built-Up Air Handling Unit ..... 27

    F. Indoor Air Handling Unit ..... 27

IV. CONCEPTUAL ESTIMATES SUMMARY ..... 29

    A. Conceptual Estimates Comparison ..... 29

APPENDIX A. SCOPING DRAWINGS ..... A

APPENDIX B. CONCORD GROUP: CONCEPTUAL EXTIMATE BACKUP ..... B

APPENDIX C. JP CULLEN CONCEPTUAL ESTIMATE BACKUP ..... C

*Intentionally left blank.*

**Executive Summary**

**Study Summary**

The County Dome and Facility Improvements Study was commissioned to assist the Manitowoc County Department of Public Works (MCDPW) with project scope and budget considerations for the following five projects under consideration:

- Courthouse Tower Restoration and Repair – initiated due to concerns about the cladding weathertightness, loss of the glass dome, and degrading appearance.
- Atrium Interior Dome Restoration – exploring the requirements for restoring the dome to its original glazed condition.
- Courthouse Exterior Window Replacement – initiated due to concerns about increased maintenance, failure of the integral blinds, aesthetic concerns related to both the uneven fading of the anodized frames, and the reduced daylighting from the window height reduction to accommodate dropped ceilings when the windows were replaced in 1978. At that time, the new and existing transoms were set with opaque spandrel panels.
- VAV Box and Valve Replacement and Controls Modernization – initiated as these items have been maintained well beyond their expected service life.
- Main Courtroom Air Handling Unit Replacement – initiated as the chillers are currently being replaced, the existing AHUs are at a point where cyclical replacement is an option and having the entire system updated at the same time simplifies maintenance and scheduling/budgeting for future facility improvements.

Existing conditions for the non-HVAC projects were visually observed and assessed for deficiencies. For the HVAC projects, discussions were held with the MCDPW maintenance and operations staff about equipment performance and maintenance. Recommendations were provided and further developed as scopes of work which were then utilized for developing the conceptual cost estimates. The projects include some “discretionary” work which is best done as part of the overall scope to avoid later excessive costs and impacting completed work. Where conditions were difficult to ascertain or were hidden by construction, they were assumed to require work. This primarily applied to the Courthouse Tower where deficiencies were found to be worse than expected, broader reaching, and presenting a greater concern due to continuing and expanding deterioration attributable to water infiltration through the failing cladding.

Only four alternates within the projects were considered. The alternates for the Tower Restoration include reglazing the dome in lieu of using copper cladding, adding a lightning protection system, and replacing some of the existing exterior light fixtures with LED fixtures. The one alternate for the Atrium Interior Dome Restoration involved replacing the abandoned cornice lighting with a fiber optic system that would preclude the need for lamp replacement at the cornice.

**Schedule**

The proposed basic schedule is as follows:

- 2022: Project and funding approval, securing of funding.
- 2023: Develop design, produce construction documents, solicit bids over years end.
- 2024: Award work and begin construction
- 2025: Complete construction on two season work (Tower Restoration) or other work if split into phases.

**Budget**

Two teams were employed to develop conceptual cost estimates for each project. The Concord Group provided an opinion from the viewpoint of a construction consultancy that provides owners representation and project management and have adjusted their opinions for a first quarter 2024 construction start. JP Cullen (JPC) provided an opinion from the viewpoint of a large commercial construction company and actively solicited bids as if these were current active projects scheduled for the third quarter 2022. The JPC estimates were then escalated to the first quarter 2024 start using the 13.5% escalation estimated by the Concord Group. All three numbers include a recommended 10% contingency except for the Courthouse Tower, for which 15% is recommended. All numbers are rounded to the nearest dollar.

<b>Project</b>	<b>Concord Group</b>	<b>JP Cullen</b>	<b>JPC Adjusted</b>
Courthouse Tower Restoration	\$11,159,473	\$18,840,998	\$21,384,533
Atrium Interior Dome Restoration	\$2,168,491	\$1,330,086	\$1,509,648
Courthouse Exterior Window Replacement	\$5,122,765	\$1,587,562	\$1,801,882
VAV & Valve Replacement with Controls	\$1,516,807	\$1,120,150	\$1,271,371
Courtroom AHU Replacement with Controls	\$1,030,457	\$401,549	\$455,758

*Intentionally left blank.*

## I. PROJECT OVERVIEW

### A. Project Justification

This report was commissioned to assist the Manitowoc County DPW in establishing project scopes and budgets for the following five historic Manitowoc County Courthouse restoration and facility improvement projects:

1. Courthouse Tower Repair and Restoration:
  - a. The increasing copper cladding deterioration has resulted in increased water infiltration that has led to the deterioration of the structural clay tile walls backing up the copper cladding, and to significant corrosion of portions of the tower's structural steel frame. The project intent would be a refurbishment of the historic construction to best prepare the tower for the next 100 years.
  - b. The 1950 recladding of the glass dome with stainless steel and removal of original copper detailing and the continued loss of copper ornament has resulted in a distressed and less than proper appearance for a public building of its stature. The project intent would be to restore the tower to much of its original appearance where possible. The dome would be clad either in copper or glass, and the original dome lantern design would be reinstated and modified for safety upon approval from the Wisconsin State Historic Preservation Office (SHPO).
2. Courthouse Atrium Interior Dome Restoration:
  - a. To remove the stainless steel infill panels and reinstall textured glass panes and provide supplemental back lighting to restore the borrowed light function of the original dome design.
  - b. The ornamental lighting at the dome drum cornice has failed and was difficult to maintain. An alternate to replace this with a remote light sourced fiber optic system is proposed.
  - c. Water infiltration from the tower has damaged the plasterwork just under the dome and requires repair.
3. Courthouse Exterior Windows Replacement:
  - a. Originally replaced in 1978, the windows have begun to experience maintenance issues, particularly the failing of the integral blinds.
  - b. The dark bronze anodizing has faded to gold in areas that are continually exposed to the sun, resulting in a noticeable uneven appearance.
  - c. To accommodate dropped ceilings, window heights were reduced and transoms were introduced. These transoms, along with existing transoms elsewhere, were all provided with opaque infill panels.
4. VAV Box and Valve Replacement and Associated Controls Upgrade Variable Air Volume boxes (VAV), associated valves, and associated controls upgrades:
  - a. The VAV (Variable Air Volume) boxes and valves provide tempered fresh air to the various building spaces. They have greatly exceeded their designed service life and are due for replacement.
  - b. The existing pneumatic control system are outdated would be replaced with current industry standard Direct Digital Controls (DDC), a process already begun in parts of the building.
5. Replacement and improvement to the second floor Main Courtroom Air Handling Unit (AHU) and conversion of the pneumatic controls to DDC:
  - a. This equipment is reaching the end of its service life and its replacement would be a follow up to the in progress replacement of the chiller system and allow for better and more efficient separated climate control of the courtroom and the courtroom offices.
  - b. The existing pneumatic control system are outdated would be replaced with current industry standard Direct Digital Controls (DDC), a process already begun in parts of the building.

### B. Project Team

Owner: Manitowoc County

- Gerry Neuser, CDT, CCCA, Director, Manitowoc County Department of Public Works
- Craig Breit, Building and Grounds Supervisor, Manitowoc County Department of Public Works

Architect/Engineer: Strang Inc.

- Larry Barton, AIA, CEO
- Kevin Donahue, AIA, Senior Project Architect
- Jim Donovan, BIM Technician
- John Kolodzinski, DE, Director of Mechanical Engineering

#### Cost Estimation – The Concord Group

- Seamus Wallace, CPE, Assistant Director, Cost Management, The Concord Group

#### Cost Estimation – JP Cullen

- Jasun Berka, Project Manager
- Luis Belmontes Jr., Estimator

### C. Study Approach

The study was organized into the following three sequential parts:

#### Condition Assessment

A limited review of the tower, interior atrium dome, exterior windows were performed by means of visual observations from grade, the roof, and within the building itself, including the tower clerestory and dome, and the lantern on top of the dome. In addition, one panel of the interior atrium dome was temporarily removed with the generous assistance of the staff from Public Works.

As the HVAC systems were at or beyond the recommended operational life and the County was already seeking to replace them, no visual inspections were made. Rather, discussions with the Manitowoc County Public Works staff in charge of the operations and maintenance of the systems were held to understand the systems as well as noticed operating deficiencies and issues.

A review of existing documentation of the Manitowoc County DPW provided resources was also made:

- A review of Drone based photos of the tower lantern.
- A review of the December 4, 2013, Manitowoc County Courthouse Sheet Metal Survey by Renaissance Roofing.
- A review of the January 2008 Courthouse Dome Condition Assessment Report by Engberg Anderson.
- Review of historic photographs from the Manitowoc County Historical Society.
- Review of digital copies of the original 1905 C.H. Tegen Courthouse design and construction drawings.
- Review of the 1984 Heating, Ventilation, & Air Conditioning Projects - Courthouse, County Office Building, Expo Merchants Building construction drawings.

Following the visual observations and review of existing documentation, a review and assessment the conditions was made and discussed with Department of Public Works staff. See **Part II | Condition Assessment** for the assessment.

#### Work Recommendations

Recommendations to address the observed deficiencies were first developed in narrative form and then expanded as to create a Scope of Work which was then outlined on the Scope Drawings. These were then further refined following discussion and input from Department of Public Works staff. See **Part III | Work Recommendations** for the narrative and **Appendix A** for the Scope Drawings.

#### Conceptual Estimates

The Work Recommendations were provided to two different teams using different means and viewpoints to arrive at their opinion of cost for each project. The intent was not for them to compete but rather to provide the study a broader understanding of the work, what it would take to accomplish that work, and to identify specific critical labor and material costs that may impact the overall project budgets. The teams are:

- The Concord Group, a construction consultancy that specializes in owner's representation, project management, and cost estimating. They draw upon a variety of local and national construction cost data bases as well as their inhouse data base which is based upon their projects and the current trends encountered.
- JP Cullen, a \$400 million+ commercial construction company with experience in large historic restoration and adaptive reuse projects. Their estimate is set up as if bid today and is based upon their own current data base for self-performed work in conjunction with sub consultant partners and material suppliers with whom they are



familiar. As a result, they can provide an in-depth look into the efforts and costs to achieve the various tasks that make up each construction project.

See **Part IV | Conceptual Estimates Summary** for a comparison of the resulting estimates on a project by project basis.

#### D. Building Description

The building is a beaux arts style rectangular three story stone structure with a central copper clad tower with a stainless steel clad dome and copper lantern. The four facades are both vertically and horizontally divided into a classical tripart system. Horizontally this consists of a rusticated brownstone basement base upon which sits the three story limestone body, which in turn is topped with a carved limestone entablature. Vertically, the facade is divided into fenestrated corners and a central projecting colonnaded entrance bay with 6 columns rising from a second floor balcony. Monumental stairs are centered on the primary east facade and secondary north and south facades. The less ornate west facade replaces the center colonnade with large, thick pilasters and omits the monumental stair and entry.

The building's structural system consists of loadbearing exterior and interior masonry walls, interior cast iron columns, and floors consisting of concrete topped clay tile flat arches between steel beams. The roof structure consists of a hipped steel framed roof infilled with a reinforced cindercrete deck. The tower is framed out by 8 steel columns and infilled with structural clay tile to form the backup walls for the copper cladding and ornamentation. The square tower is capped by an octagonal steel framed dome that originally was glazed but subsequently replaced with stainless steel panels and ribs in 1950.



Courthouse viewed from SE circa 1910.



Courthouse viewed from SE circa 2007.

#### E. Historical Status

The Manistowoc County Courthouse is a designated historic structure, listed on both the National and State Registers of Historic Places, and appears in the Wisconsin Historical Society's Architecture and History Inventory.

Historic Name: Manistowoc County Courthouse

WHS Architecture and History Inventory Reference Number: 16252

State & National Register Reference Number: 81000047

Property Location: 1010 S 8<sup>th</sup> Street, Manistowoc, Manistowoc Co., Wisconsin

Property Features:

- Year Built: 1906
- Period of Significance: 1900-1924
- Area of Significance: Architecture; Politics/Government

- Applicable Criteria: Event; Architecture/Engineering
- Historic Use: Government: Courthouse
- Survey Date: 1985
- Architectural Style: Classical Revival, Beaux Arts
- Resource Type: Building
- Architect: Christopher Tegen
- Builder: George Rickman & Sons Co.
- Cost: \$159,200

**Designations:**

- National Register Listing Date: 4/16/1981
- State Register Listing Date: 1/1/1989

**Number of Resources within Property:**

- Contributing Buildings: 1

As a listed historic structure owned by Manitowoc County, per State Statute, all work which may have an adverse effect on the historical property must be reported to the State Historic Preservation Officer (SHPO) for review. If the work is determined to have an adverse effect, per State Statute 44.40 (3), the SHPO "may require negotiations with the State agency to reduce such effects" or per State Statute 44.40 (4) "deny or impose conditions on a permit, license, authorization, variance". As such, all work should be developed in partnership with the SHPO and ultimately submitted for their review.

## F. Project Schedule

The project as conceived is based on the following schedule:

- Calendar Year 2022: Development of Project Scopes; Work Recommendations by Project based upon a visual condition assessment of existing conditions; Budget Development based upon construction cost estimates.
- Calendar Year 2023: Final Project Scope(s) established; Design Development and Construction Documentation based upon final Project Scope(s) and additional site investigations as may be warranted by Project Scope(s) and Design; start of Bidding.
- Calendar Year 2024: Bids Due, start of Construction.
- Calendar Year 2025: Pending Projects Scope(s) selected, construction may continue or mark the start of additional Project(s).

## G. Project Budgets

See Part IV | Conceptual Estimates Summary for a comparison of each team's opinion of cost for each project.

### PROJECT ALTERNATES

Two Project Scopes have Project Alternates. The Tower Restoration has three proposed alternates:

- With cladding the dome in copper as the base price, recladding it in glass will be considered an alternate.
- Replacing the existing 9 clerestory exterior light fixtures with energy saving LED fixtures.
- Adding a lightning protection system for the tower.

Atrium Interior Dome Restoration has one proposed alternate:

- Replace the abandoned bare bulb lighting system at the underside of the drum cornice with a fiber optic system. This system would provide a maintenance free fixture at the cornice and remote lighting sources to the attic where they would be readily accessible for maintenance.

### ECONOMIC FACTORS IMPACTING CONSTRUCTION COSTS

Significant extenuating factors are currently impacting construction costs and resulting in record inflation, protracted materials/products delivery schedules, and final project deliveries. The pre-pandemic construction labor shortage has been supplemented by post pandemic general labor shortages, supply chain challenges, transportation backlogs, and the price of fuel. While the cost spikes of some materials and products have begun to reduce, it must be noted that the increased annual rate of inflation which has already occurred, will not. Rather, the future annual rate of inflation will ultimately decrease. An additional factor to consider that will impact costs in 2023 is the scheduled renegotiation of labor agreements for several trade unions.

## II. CONDITION ASSESSMENT

### A. Tower Architectural Condition Assessment

#### INTENT

As the Tower needs to be made watertight and corrosion addressed, the County seeks to restore the tower by replicating the original copper cladding and ornamentation, possibly reglazing the dome per the original design, address structural repairs, replace the clerestory windows to emulate the original design but not be operable, and improve flagpole operability.

#### FLAGPOLE

##### Observations

A review of historic photos and the original construction drawings indicate that the building as originally designed and constructed did not have a flagpole. Per photographic evidence, the flagpole was added as part of the redesign of the dome lantern sometime before 1950. The flagpole itself is only accessible by use of a lift from grade and cannot be seen from the lantern.

The flagpole is a copper clad pole with either a wood or metal core construction and is topped with a copper sphere. The cladding of the pole is dented in places and polished from the flag, halyard, and rigging rubbing against it. The vertical seams of the copper cladding appear to be slightly pulled apart but it is difficult to confirm due to the distance.

The current rigging fittings appear to be either aluminum or stainless steel and face the southwest. The original fixed copper or bronze truck at the top of the pole is not used and the replacement rigging consists of a fixed pulley clamped to the pole at the top and a lanyard pulley at the base used to hold the halyard against the pole. As the flag is lowered, it hits the lanyard pulley and both flag halyard and lanyard pulley must be lowered as the flag cannot pass through the pulley. There is a stainless steel brake metal panel attached to the copper cornice over which the halyard and lanyard ropes are rigged. Remnants of a horizontal boom that might have held the rigging off the roof can still be seen attached to the roof. The ropes pass through eyehooks on the lantern guardrail and are tied off to the guardrail. The remaining length of rope is then wound around the top and bottom of the guardrail. A broken halyard cleat was observed on guardrail and fasteners holes for other halyards were noted on the east guardrail segment.



Halyards rubbing on dome and pulled taught to edge of cornice.



Halyards tied around guardrail. Note rusted anchors for missing cleat on rail.

**Assessment**

- The condition of the copper cladding of the flagpole likely requires replacement.
- The makeup and condition of the structural core of the flagpole is unknown. This should be further explored during any work on the lantern.
- The original truck at the top of the flagpole is abandoned and may not be functional and may not be repairable.
- The replacement flag rigging system faces the prevailing window from the southwest. As a result, the flag and halyards tending to wrap around the flagpole, typical of such systems.
- The replacement rigging system is incomplete, resulting in damage to the building as the halyards rub against the copper dome and the stainless steel brake metal panel installed over the cornice. This type of system typically requires a horizontal boom or standoff at the base of the dome to always hold the halyards off the building.
- The halyard and lanyard are tied off directly to the copper clad guardrail in a neat manner but is unsightly from grade and may be damaging the guardrail cladding copper cladding and framing by adding undo stress on the guardrail.
- Access to the flagpole is via a steel ladder, though the narrow compression ring at the top of the dome framing, and through a small access hatch that takes up a large portion of the lantern floor. The operator of the lanyards cannot see the flag or flagpole from the lantern. As a result, raising and lowering the flag is a minimum of a two person operation, with at least one person to operate both lanyard and halyard while an observer below indicates where the flag is in relation to the top of the pole.

**Items for Consideration**

- The existing copper or bronze truck may be able to be repaired and reused.
- Change the flagpole to either stainless steel or painted steel and omit the copper cladding.
- Completely redesigning the flagpole and rigging system along with the lantern roof as part of the recladding of the tower. See further discussion in the Considerations portion of Copper Cladding section below.
- Remove the flagpole from the lantern dome and return the lantern to the original design. There is historical precedence for this as the building as originally designed did not have a flagpole on top of the lantern. A more accessible but suitable symbolic and dignified location maybe in front of the main entry where flag ceremonies could also be performed.

**COPPER CLADDING****Observations**

The review of the Tower's copper cladding existing conditions was performed by means of firsthand observations and photography from grade, from the promenade, and from the lantern in addition to reviewing previous drone photographs and the Sheet Metal Survey by Renaissance. In general, numerous pinholes, open joints, improper exposed ferrous fasteners, and missing fastener caps were observed. Copper cladding at the lantern has numerous open seams and failing joints. There are tears in the skyward faces of various copper elements and numerous applied ornaments and pressed ornamental pieces are loose or missing. Two missing 'S' brackets from the panels above the clerestory entablature were found stored in the clerestory. A missing guardrail spindle at the lantern deck was found stored in the interstitial space between the lantern deck and the top of the structural framing compression ring. The wood frame of the spindle appears to have been held in place by one or two finishing nails at either end. The patched ceiling of the lantern is sagging and appears to be wedged in place with wood at the top of the columns.

At the dome base and clerestory below, numerous corroding ferrous fasteners were observed inside and out, as what was seen in the previous survey photos. From inside the dome, the brake metal armature supporting corners was found to be heavily corroded or to have failed. The galvanized steel armature for the dome drum appears in serviceable shape but exhibits varying amounts of surface corrosion. These may not be original to the building given the change in the types of fasteners (square vs. hexagonal) and materials (painted vs. galvanized iron vs. copper or bronze).

When compared to the historic photographs and historic construction drawings, the lantern roof, skirt at the base of the lantern, ornament on top of the entablature, and cladding and ornament around the clerestory windows appear to be simplified versions of the originals or wholly unrelated designs.



Original clerestory copper ornament circa 1915. Note missing swag above right window.



May, 2022: Extensive missing ornament and the simplified window frames of the 1950s repairs.

#### Assessment

- The copper cladding and is at the end of its serviceable life and requires complete replacement.
- The observation and assessments made in the previous condition reviews of the copper cladding were readily confirmed in this review of existing conditions. These include:
  - Lack of continuous backing for skyward surfaces resulting in deformation, cracks and tears, open joints.
  - Missing anchorage caps, corrosion of and staining from exposed ferrous anchors.
  - Worn and failed solder joints
  - Worn and failed copper cladding.
- Water infiltration through the failing cladding has impacted various structural elements, armatures, and fasteners. Unfortunately, many of the most vulnerable areas and surfaces are hidden from view by construction and cannot be assessed unless opened or the element fails in a manner that exposes the damage.
- The current visual appearance of the tower is a much simplified version of the original and does not fully reflect the design and craftsmanship of the original. This includes the salvaged bracket stored in the clerestory. It is a simple boxed out version of what historic photos show to be originally made with stamped sides.

#### Items for Consideration

- **Lightning Protection System:** Currently there is minimal combustible material on the tower. When providing continuous solid backing for skyward surfaces, dimensional lumber and plywood sheathing are required which will introduce more flammable material to the tower. In addition, protection of the history and current proposed reinvestment in the restoration of the tower should be considered. A full lightning protection system should be considered.
- **Design of the Lantern and Lantern Roof:** Consideration needs to be given as to which lantern design should be incorporated into the restoration. The options are:
  - The original historic design consisted of a colonnade surmounted by conical roof and a small cap, no flagpole or guardrail. Fall protection tie-offs must be provided in lieu of the guardrail.
  - Maintain the current design and add a rigging boom that is structurally anchored to the lantern structure.

- A hybrid design that blends the original conical roof with the flagpole, add a structurally secured rigging boom, and provide the guardrail. This would need to be approved of by the State Historic Preservation Office (SHPO) as it is a deviation from the two established historic designs, thereby creating a potential false historical narrative.
- Redesign the dome and flagpole to allow for the flagpole to extend partway into the lantern and an opening or roof hatch to be building in the dome. This would also need SHPO approval and may prove technically difficult as well as expensive.
- Coordinate recladding of tower with cladding of the dome in either glass or copper. In either scenario copper ribs need to be replicated to restore the original appearance of the dome.

**STAINLESS STEEL CLADDING**

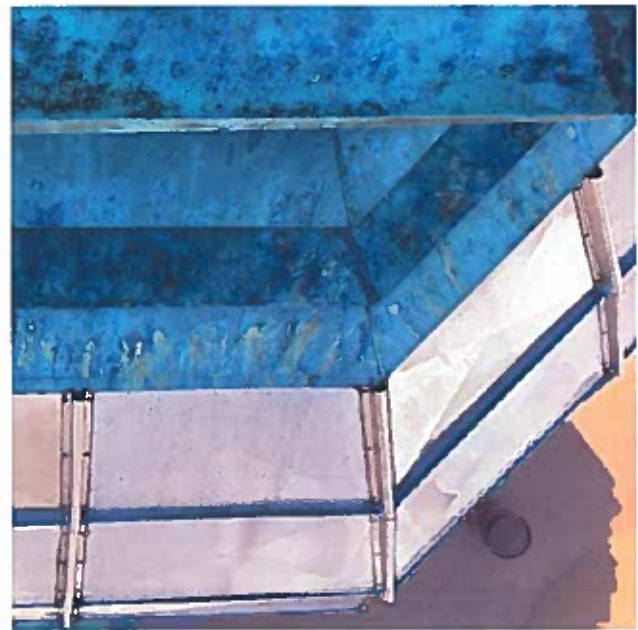
**Observations**

The stainless steel cladding replaces the original prismatic glass and the copper ornamental vertical ribs and horizontal joint covers. It consists of large panels applied in a shingled manner to promote runoff being drained down and out, which are held in place by applied vertical ribs and horizontal joint covers, both simplified versions of the original design. This whole assembly is secured to the original copper clad glazing iron armature using exposed stainless steel bolts. The regularly spaced bolt locations on the exterior speak to prefabrication of the stainless steel while angled and somewhat random penetration of the armature indicate the holes were then field drilled through the existing structure.

The tops of the vertical rib are partially open to the sky and able to collect some runoff from the copper lantern skirt above. Sealant has been applied to the fasteners and joints between the ribs and panels at several locations on the upper more horizontal portions of the dome. At the horizontal joint covers the upstream joints collect particulate runoff. Weepholes at the downstream side of the cover joints appear to be the source of much of the soiling and staining of the stainless steel panels. Water infiltration through the upstream edge of the horizontal joint covers is drained out through a series of weep holes at the underside of the joint covers.



Stainless steel panels and ribs of the 1950s repairs.



Note the open tops of the stainless steel ribs.

**Assessment**

- The stainless steel, although somewhat soiled and stained, appears in good condition.
- The effectiveness of the shingling of the stainless steel panels as executed is questionable given damage seen to the dome armatures and interior framing.
- The partial open tops of the vertical ribs are introducing a limited but regular amount of runoff into the ribbing from the copper lantern skirt just above. Depending on the amount of shingled overlap and its ability to fully cover the armature and structure below, this condition is likely leading to some corrosion of the armature and dome structure. Given this runoff washes across the copper lantern skirt, additional corrosion from galvanic action is possible.

The full extent of corrosion to the armature and dome structure can only be assessed following the complete removal of the stainless steel cladding and the armature copper wrapping.

- The light but noticeable staining on the panels appears to emanate from the weepholes at the underside of the horizontal ribs covers. Presumably the particulate collecting at the upper side of the horizontal joint covers eventually overflows the cover or works its way through the skyward joint and weeps out at the underside of the cover.

#### Items for Considerations

- If the intent is to maintain the current stainless steel cladding, it should be further reviewed and observed from inside during heavy rain to confirm weaknesses in the design and then modified to eliminate these shortcomings to the greatest extent possible.
- The current cladding is not historic or sympathetic to the character of the original design. Since the stainless steel cladding would need to be at least temporarily removed to address final assessment, repair, and priming and painting of the dome structure and support armature, it is well work while to review the cost of reglazing the dome or at least replacing the stainless steel with copper panels and copper ribs designed to replicate the original copper ribs.
- The 2008 exploratory removal of a stainless steel panel was unable to provide insight into the original means to secure the glazing to the armature. A group of four contiguous panels around a single rib/upper and lower row is likely required. Additionally, design/engineering consultants with experience in restoration of known examples of glass domes/conservatories of the same era should be engaged during the design phase.
- If reglazing the dome is considered, the following requirements will need to be met:
  - Safety glazing is code required. Given the height, laminated glass may preferable over tempered glass even though the dome is not occupied.
  - As prismatic glass the thickness and size of the or the original is not available, careful consideration of alternatives to replicate the original appearance is warranted as clear glass would not be acceptable. Patterned glass or laminated glass with a patterned interlayer should be considered.
  - Design of a suitable anchorage system meeting current wind load requirements.
  - The development of profiles to create an approximate replication of the original copper ribs and horizontal joint covers based on historic photographs and original construction drawings.

## STRUCTURE AND BOOK TILE INFILL

### Observations

#### Clerestory:

The courthouse tower consists of a steel structural skeleton, infilled with structural clay tile and brick to form walls. It is supported by solid masonry piers in the attic which are connected by three side-by-side steel I-beams that form the lintel supporting the thickened brick base wall of the tower. This base wall supports both the tower and the inner side of the steel and cindercrete promenade deck that encircles the base of the tower. A few randomly spalled bricks were observed as were a few holes cut into the brick. There is some efflorescence and water staining on the walls. The steel framed cindercrete promenade deck was reinforced from the underside with heavy timber beams and thickened plywood decking to help support the weight of work during the 2009 balustrade and roof restoration as the structural capacity of the deck was unknown. While the cindercrete deck showed signs of past water infiltration, no signs of new water infiltration on the reinforcement were observed.

The clerestory portion of the tower rises above the promenade deck level to the underside of the dome floor and consists of steel columns partially embedded in structural clay tile infill walls. The columns are cross braced by a lower and upper level of horizontal beams spanning the open interior, as well as diagonal beam and tension rod bracing. Just below the lower level of beams and centered in each of the structural clay tile walls, a large aluminum barometric relief damper has been cut into the wall. The masonry below the louvers is water stained and there are some limited areas of efflorescence. Just above this level are the clerestory's four facades, each containing three large, monumental windows. A heavy gauge wire mesh debris screen containing remnants of past window breakage is supported by the lower level of cross bracing beams. A narrow wood framed walkway on top of the screen provides access from the stair to the exterior promenade via access doors set in the west elevation's center window. Wood planks provide movable temporary access as needed.

The tower steel is painted black and may be an original coating applied during construction as there are only limited signs of paint on the adjacent masonry infill. The coating is thin and failing. Mild surface corrosion is visible sporadically at the lower steel but becomes increasingly more extensive and severe further up the clerestory. From an area just below the upper level of horizontal bracing through the column attachment to the dome trusses and to the underside of the dome

floor deck, the exposed steel columns, the dome trusses, and horizontal bracing connections are covered in heavy surface corrosion. This also occurs on portions of the embedded steel beams supporting the clay tile ceiling in the corners of the clerestory. These areas originally supported the now missing corner spheres at the base of the dome drum. The extent of corrosion on the embedded portions of the steel columns and beams could not be observed.



Interior of clerestory. Note structural clay tile, steel columns, wood bracing of windows, wood catwalk, and debris screen over lower cross bracing. The ship ladder in the center leads to the dome.



View of the clerestory just below the debris screen. Limited efflorescence and spalling brick indicate a minimum amount of water infiltration of the past 100 years. Note barometric pressure louver below center window.

There is extensive water staining and efflorescence on the clay tile along the ceiling in the corners and adjacent to the columns. Several spalled structural clay tiles, some with mortar repairs, were observed. Some tile between the closely spaced columns and windows appear loose. At the lower portion of the walls, the structural clay tile infill shows only limited staining and efflorescence. No cracks in the units or mortar joints were observed at these locations. Numerous thru wall anchors attached to sheet metal anchor plates are from previous repairs to the exterior cladding.





Ship ladder to dome. Note dome floor deck and joists.



Water staining and efflorescence on structural clay tile walls and corner ceiling.



Extensive water staining and efflorescence of structural clay tile. Note heavy corrosion of steel column supporting dome truss



Broken infill tile between window and steel column.

The clerestory is capped by the dome floor trusses and deck, likely added as part of the 1950 repair work. It consists of steel joists and corrugated metal decking, topped with a hot mopped felt roof. Supplemental galvanized structural steel has been added where needed to connect the joists to the tower framing. The dome floor structure and deck show only limited surface corrosion, likely the result of condensation rather than a leak in the roofing layer above.

A steep steel ship ladder provides access from the clerestory to the dome floor above. Adjacent to it is the remnant of the original steel ladder to the dome lantern currently provides improvised access to a suspended wood gangplank to the return air duct at the top of the interior dome as well as supporting the winch for the atrium chandelier. Both elements have been

painted over time, but at the rungs and treads the coating has predictably worn off. Only mild general surface corrosion was noticed.

Dome & Lantern:

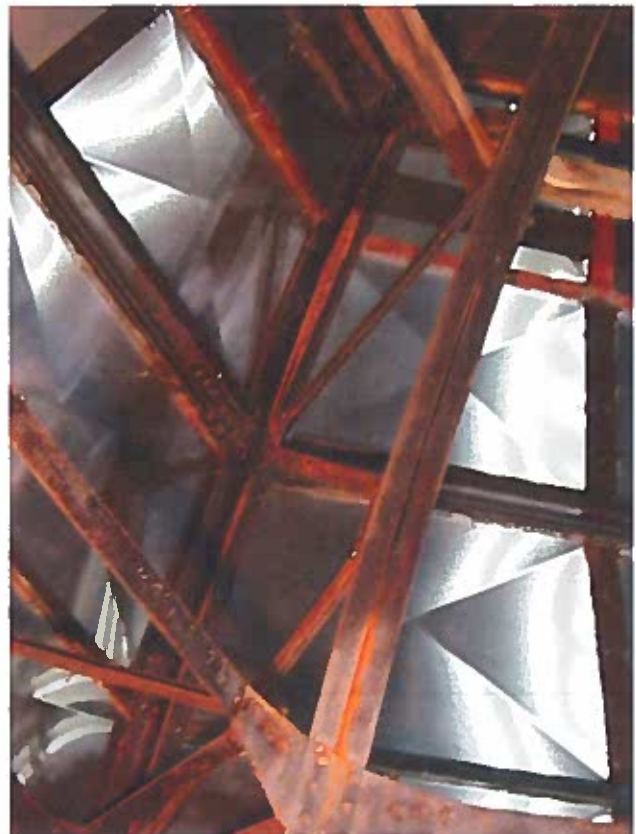
The dome structural framing consists of a series of eight curved trusses with horizontal secondary trusses and steel members providing cross bracing. At the top of the dome the trusses converge on a compression ring through which the top portion of the original ladder to the lantern still provides access. The ladder, which has light to moderate surface corrosion, stops approximately 2' short of the lantern deck, requiring one to grab the edges of the roof hatches curb to pull oneself up to the lantern deck. The steel columns of the lantern structure rise from the top of the dome trusses to form the 8 columns of the lantern and are tied together by structural iron/steel framing of the lantern roof. A photo from the Renaissance Sheet Metal Survey shows the framing may be from original conical lantern roof but with wood framing applied to form out the curve of the current dome. The flagpole base is also visible but its composition cannot be determined.

The coating on the visible structural steel of the dome and lantern is thin and heavily compromised. Mild surface corrosion can be seen on most surfaces. Of greater concern are the concentrated areas of intense corrosion located about three quarters of the way up on all the trusses. Two of the eight trusses have extensive delamination of the steel angle top chords while the other six exhibit minimal to heavy surface corrosion. Corrosion on the various elements of the trusses continues downstream of these locations. The condition of the lantern framing is hidden within the lantern construction and could not be observed.

The dome floor roofing layer shows signs of deterioration more from age than use. While exposed to temperature fluctuations, it is protected from precipitation and UV by the stainless steel cladding of the dome.



Dome structural trusses connect to a compression ring at top of dome. Note ladder to lantern through ring.



Past leaks have not only corroded the trusses but have also begun to push apart the members.

Cladding Armature:

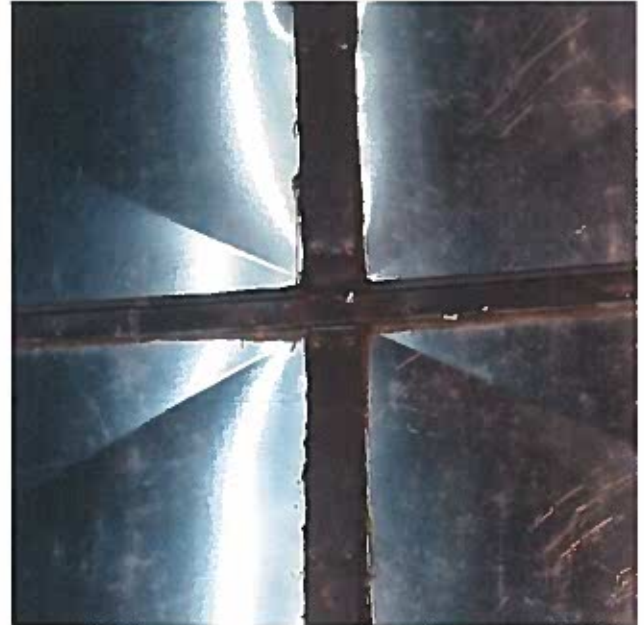
The armature supporting the dome cladding consists of a separate copper wrapped iron or steel vertical and horizontal framework connected back to the roof trusses by means of a series of metal brackets standing off the curved outer chords of the dome trusses. The framing aligns with the dome cladding's vertical ribs and horizontal stainless steel joint covers.

How the original glass was secured to the armature is unknown. Mild to heavy surface corrosion is visible on the unclad ends of the armature framing and on the support brackets at many locations. Most of the armature framing is wrapped in copper and is not visible for observation. Two colors of copper cladding were noticed, a greenish black, likely the original copper cladding, and a reddish brown likely from subsequent repairs.

The armature for the copper clad dome drum consists of galvanized steel members and sheets. Wood flooring was used to provide continuous support the skyward faces. The galvanized sheet metal has mostly rusted away and the galvanized steel members also have some surface corrosion.



Copper clad metal armature originally supported the dome glazing.



While it is unknown how the glass was secured, the stainless steel panels were field drilled and thru-bolted.

### Assessment

#### Clerestory:

- The visible steel structure within in the clerestory along with the ship ladder to the dome and the remaining portion of the original access ladder require repainting to protect them from corrosion. The existing coating is inadequate and has surpassed its useful life and may also contain lead.
- The visible heavy steel corrosion at the top of the clerestory points to long term water infiltration. The condition of the embedded steel is unknown and can only be assessed by a closeup inspection and ultimately removal of the clay tile covering. There is concern about the unknown condition of the steel embedded within the structural clay tile infill and its impact on the structural framing's overall capacity. The conditions should be observed during prolonged rain events to determine if water infiltration is actively occurring, allowing the deterioration of the steel and masonry to continue and intensify. If infiltration is occurring, action should be taken sooner rather than later as structural stability issues will inevitably result.
- The structural clay tile and brick infill up to the upper level of cross bracing requires some attention in the form of resetting tile and pointing joints at the narrow areas between window openings and the adjacent columns. Areas above this are of greater concern selective replacement in addition to repair, resetting, or repointing is required.
- Several barometric relief vent louver blades appear stuck open and may contribute to water infiltration.
- The use of the bottom half of the original lantern access ladder for anchoring the chandelier winch to is awkward and places an unintended load on the ladder.
- The dome floor joists, metal deck, and the ship ladder to the dome appear to be in serviceable condition with only mild surface corrosion and repainting needing to be addressed.

#### Dome & Lantern:

- The visible steel structure within in the dome and on the remaining portion of the original access ladder require repainting to protect them from corrosion. The existing coating is of minimal protection and at the end of its useful life, and it may contain lead.
- Most of the observed corrosion is likely the result of minor leaks and condensation, however a full removal of the cladding of the dome would be required to determine the full extent of corrosion and damage.
- The upper area of the curved trusses is an area of concern given the corrosion has resulted in the delaminating and rust jacking of the back to back curved steel angle top chords of at least two trusses (facing the southwest). In addition to loss of sound cross section, the rust jacking of the top cords out of plane, although minimal at this point, could create unaccounted for additional stresses on the trusses and deformation of the dome if allowed to continue. If the leaks are active, the continued corrosion and rust jacking would result in expanded and accelerated deformation, resulting in additional leaks. A review of photos from the 2008 Engberg Anderson report could not determine if the damage has increased. The damage at these two trusses will require structural repairs. The remaining 6 trusses would need to be further inspected following the removal of the dome cladding to determine if structural repairs are required.
- The condition of the lantern structure could largely could not be directly determined as it is hidden within the cladding. Based on the Renaissance Sheet Metal Survey photo, there is likely extensive corrosion, possibly requiring replacement of that steel framing.
- The hot mopped dome floor, although likely 70 years old, still performs well given its limited exposure to precipitation and UV. Should the dome be restored, this roofing should be replaced.

#### Cladding Armature:

- While most of the observable corrosion on the cladding armature is surface corrosion, additional observations following the removal of the dome cladding, and ultimately the copper cladding on the armature would be required. If they are to be reused, all will require cleaning, repainting, and recladding. Some elements may require replacement due to extensive corrosion or damage from the stainless steel through bolting.

#### **Items for Considerations**

- Testing of the coating on the metal should be performed to determine if lead is present. While the tower would likely need to be tented or contained as part of the normal paint removal blasting process, the presence of lead would require specially certified contractors and continued air quality testing around the site during the removal process.
- A metallurgical analysis of the steel may be warranted to determine its composition and structural qualities, and any special requirements for welding should welded repairs be required.
- Review of atmospheric conditions in the attic and clerestory space to determine if venting for temperature and humidity control of the entire attic and clerestory is adequate and if there are additional issues that should be addressed. A review could include wireless temperature and humidity monitoring of both spaces along with an exterior located monitor and a courthouse atrium located control monitor. The review should last a minimum of one calendar year to ensure an understanding of conditions during all seasons.
- Additional inspection of tower's structural steel, the glazing armature, and structural clay tile will be required following the removal of the copper and stainless steel cladding. Limited areas of the structural clay tile will need to be undertaken to further investigate and inspect corrosion and damage to steel currently embedded in the structural clay tile infill.
- Provide a more secure and safer access to the return air duct/dome grille. This could be addressed as part of the Atrium Interior Dome Restoration.
- Replace the wood gangway from the stairs to the Promenade access doors on the west elevation with a steel purpose built catwalk with code conforming guardrails.
- Extend a purpose built steel catwalk with code conforming guardrails to include access to the complete perimeter of the clerestory to provide safe and quick access to the windows and walls.
- Provide electrical service with convenience outlets and work lights at clerestory and dome levels.
- Perform any repairs to the existing debris screen.

### **CLERESTORY WINDOWS AND DOORS**

#### **Observations**

The clerestory level windows consist of three half round topped monumental windows on each of the four clerestory elevations. Per historic photos and the original construction drawings, the original windows consisted of the fixed half round sunburst window on top of a window with a pair of vertically stacked 6 over 6 (side windows) and 8 over 8 (center windows) true divided single glazed sashes. The bottom sash was fixed and the upper sash operated on a horizontal pivot. Per historic photographs, and as was typical of the era, the wood frames were erected first and the infill walls were built

around them. A pair of painted aluminum access doors centered in bottom sash of the west elevation center window provides access to the promenade and courthouse roof.

The half round sunburst windows appear to be the original painted wood windows, and largely contain the original prismatic glass. The exterior brown paint and glazing compound is failing and the sills appear to be heavily weathered. The light grey paint on the interior is thin and worn with only some flaking observed. The wood appears dry but remarkably well preserved if original.



The clerestory windows; the half round sunburst windows are original with original glass.



The frame and muntins of the original sunburst windows are thicker than the replacement sash below.



Access from clerestory to promenade deck.

The stacked sash windows consist of dimensional lumber frames and either painted aluminum or wood replacement sash with true divided single glazed frosted glass. All replacement sashes are non-operable and reinforced with 2x4 bracing on the interior. The wood replacement sash muntins are thinner and shallower than those of the half round windows, and are likely easily damaged considering the collection of broken glass and muntins seen on the wire mesh debris screen. The exterior paint has failed, resulting in weathering of the wood.

The pair of painted aluminum promenade access doors are narrow as they are sized to fit within the muntin pattern of the windows. They are in good condition but could use new perimeter gaskets and an adjustment to the throw bolts that secure the doors closed. A painted steel stair with handrails provides the transition between the interior access level and the lower exterior promenade level.

#### Assessment

- The existing sunburst windows may be able to be restored and the old growth wood used in them is far more robust and rot resistant than commercially fast grown wood that is standard today. Given the inaccessibility of their location and need for continued cyclical maintenance, replacement is a more viable long term solution.
- The frames and fixed stacked sash windows do not match each other and do not match the profiles of the frame, sash, and muntins of the fan/sunburst windows. The wood frames and sash need a complete refinishing if not complete replacement.
- From a distance, the frosted appearance of the stacked sash glazing is slightly more obscuring than that of the original prismatic glass still in the sunburst sash. Given the glass shards inside, switching to a laminated or tempered glass may reduce breakage.
- The operable upper sash of the clerestory windows may have been part of a rudimentary air circulation system. Operable courthouse windows drew in air, circulated up through the interior dome and out the tilt windows of the clerestory by means of the chimney effect produced by the height of the clerestory. This would have supplemented exterior wall vent shafts noted on the original drawings.

#### Items for Considerations

- The original exterior paint color of the windows is unknown but samples may be found on the original frame and sash of the sunburst windows. In an absence of evidence, a brown to match the adjacent copper would be a reasonable selection.
- A full replacement of all windows (sunburst and stacked sash) is appropriate. Returning the upper sash to a fixed pivot would not be required but the appearance of the sunburst window over the stacked 6 over 6 and 8 over 8 sash would need to be maintained. In addition, the profiles of the frame, trim, sash, and muntins of the sunburst sash should be used as the basis for the profiles of the new windows.
- If full window replacement is pursued, consider copper clad ("Kalamein") wood windows. Aluminum or steel framed or clad windows are not appropriate due to the potential for galvanic damage from the surrounding copper. Painted wood windows require monitoring and cyclical maintenance and the standard pine wood available today, despite protective coatings and impregnations with preservatives, does not perform as well as old growth wood or specific species with inherent decay resistance found in the heartwood. Given the inaccessible location and lack of regular monitoring due to the location, a painted wood window is not appropriate. Being set into a masonry opening may present challenges given that masonry stays wet for longer periods and a wood frame may need additional protection. Acetylated wood may be an option as it was used on the Minnesota State Capital Restoration where many of the large operable windows were replaced.
- Reglaze the windows with safety glass, either tempered or laminated, for the increased strength and safety.
- Prismatic glass the thickness and size of the original is not available and clear glass is not acceptable. Use of a lightly frosted or custom pinstripe printed PVB interlayer or applique may simulate the slightly obscuring appearance of the original glass. It is also filters out 95% of UV, resulting in less fading/deterioration of materials.

## B. Interior Dome Architectural Assessment

### INTENT

The County wishes to consider the possibility of restoring the Courthouse's atrium interior dome to reincorporate glass per the original design and provide appropriate supplemental backlighting.

### INTERIOR DOME

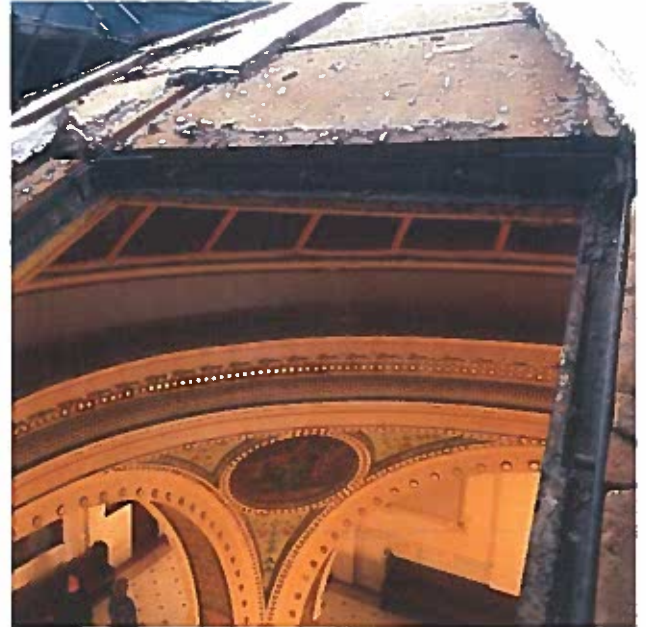
#### Observations

The atrium interior dome consists of an approximately 30' diameter shallow steel framed dome, faced with bent wood trim and set on a plaster faced structural clay tile drum. Surface corrosion on limited specific areas of the dome were observed. The wood is held to the steel frame by small metal tabs screwed into the trim and which grip the frame. One wood rib is cracked and is slightly warped. The existing bullnosed profiled plaster just below the dome is water damaged in many places. The outer face of the drum is bare structural clay tile wrapped in dust filled batt insulation that is falling off the face of the drum. The dome itself is set with stainless steel panels in lieu of the prismatic glass and is covered in deteriorating

polyisocyanurate insulation. The stainless steel panels, which drape to follow the horizontal and vertical curve of the dome, are held in place by steel pins which are in turn held tight by wood wedges. The domes original 6' diameter center ventilation grate, through which the atrium chandelier is hung, is now attached to the large galvanized sheet metal return air duct. The duct slopes down the dome and would likely be seen in silhouette if the original glazing was still in place.



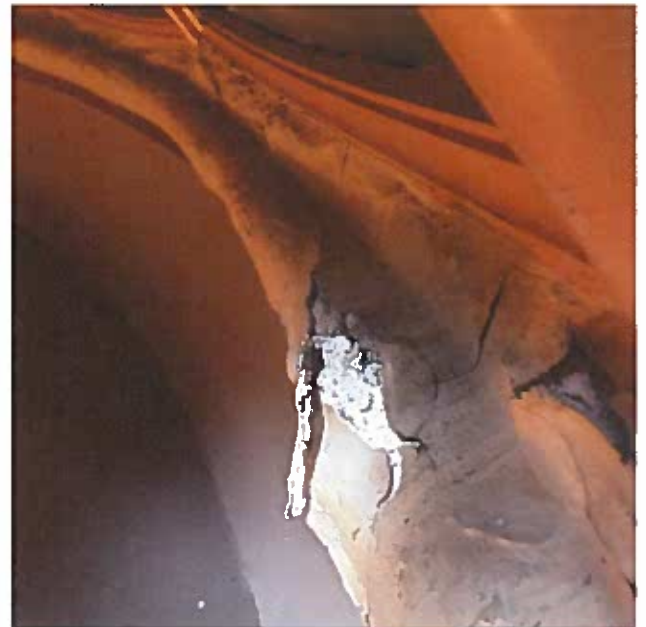
Insulated topside of Atrium Interior Dome.



Opening in dome frame at removed stainless steel panel.



Metal clip securing wood trim to metal dome frame.



Moisture related damage to plaster at base of dome.

The chandelier can be lowered by means of a pulley, secured to the lower level of horizontal steel bracing in the clerestory, and a hand winch, attached to the base of the remaining lower segment of the original steel ladder to the lantern. When the winch is not in use, the chandelier is secured across the opening of the dome grille with two steel rods. The gathered electric cabling is loosely bundled to the side rather than wound on its own drum.

At the mid-height of the dome drum, there is a plaster cornice, the underside of which contains 72 abandoned bare bulb fixtures between the cornice modillions. Highly inaccessible, the bare incandescent lamps required constant replacement. When fixtures and wiring began to fail over time, the lights were abandoned.

#### Assessment

- Except for one cracked wood rib trim, the dome frame and trim are in good condition and likely need a cleaning or repainting following the repair of the cracked rib trim.
- The plaster bullnosed rib just below the dome needs significant restoration.
- The dome and drum are clad in insulation to reduce heat loss through the dome. The deteriorated and sagging insulation needs replacement and a better manner to hold it in place on the vertical face of the drum.
- The chandelier hand winch is poorly located. The loose bundling of the electrical wiring is dangerous and susceptible to breaking or pulling loose.
- The access to the central grate/return air duct sways and is not as safe as it could be. A more secure access should be provided.
- The light ring at the underside of the drum cornice is inaccessible except by scaffolding over the main stair. The use of a pole with lamp glove was difficult, dangerous, and may have contributed to the failure of fixtures and wiring over time. The lights are currently nonfunctional and abandoned.

#### Items for Considerations

- Replace the stainless steel panels with insulated safety glazing or, if visually suitable, polycarbonate multi-celled panels. The use of a pattern or frosted PVB layer in laminated safety glass would permit both outer surfaces of the glass to be easily cleaned while diffusing light from the clerestory and supplemental lighting in the attic while matching the appearance in historic photographs.
- Replace hand winch with electric remote controlled winch with a drum for the electric cabling. Relocate the winch to the steel I-beam lintels or a masonry pier. Provide a secondary tie-off for securing the chandelier in place when winch is not in use.
- Rework the return air duct through the dome's center grill. Modify the existing layout such that the duct is lifted off the dome, hangs closer to the underside of the lower level of steel bracing above the dome and come down within the reentrant corner of the northwest pier and wrap around it connect to the existing ductwork. It is conceivable that the ductwork could be reduced in size pending an analysis of the existing return air system and replacing the existing fan with a more efficient fan array. This analysis should be performed.
- Rework the failed abandoned light fixtures at the underside of the drum cornice with fiber optic lit elements. Run fiber optic through cornice and collect cables around perimeter of cornice shelf and pass through drum wall to remote light source that could be easily maintained.

### C. Courthouse Exterior Windows Assessment

#### INTENT

To replace the existing aluminum replacement windows with new anodized aluminum windows that match the original layout configuration - full height double hung windows single windows and vision glass in the transoms of paired windows. As the ceiling of many of the rooms are at a level flush with the bottom of the current spandrel paneled transoms, light wells would be created in the dropped ceilings to facilitate the return to the full height glazing. New window treatments would also be used throughout.

#### Observations

The existing courthouse windows are heavily faded dark bronze anodized aluminum replacement windows installed in 1978 over the original wood window frames and exterior trim. As part of the 1978 replacement, the height of the single taller double hung windows at the corner bays of the building were reconfigured as a shorter double hung window with a top spandrel panel to match the appearance of the paired double hung window groupings found at the center bay of each facade. This accommodated dropped ceilings used to hide new mechanical. A limited number of the created spandrel panels are used to host mechanical louvers. Per a review of the 1978 window replacement drawings, the aluminum frames and sash are not thermally broken but sash are double glazed with Solar Bronze glass. In addition, the windows have a supplemental internal removable glazed sash that creates a protective pocket for horizontal blind window treatment and adds to the thermal insulating value.



Several window openings around the building were designed fully infilled (west elevations) or with infilled transoms (third floor of north, west, and south elevations). Additional windows have been “blinded” since with opaque spandrel panels, notably for mechanical purposes at the basement level and for privacy or security measures at the courtrooms (second floor north elevation infilled with brick, third floor south elevation infilled with limestone). Two windows at the north end of the east elevation have been converted to doorways for the added fire escape.



Typical aluminum exterior window, note fading of dark bronze anodizing. Reduced sash size allows for the insertion of an opaque spandrel panel.



Typical window at interior. Note how dropped ceiling cuts off top of window. The spandrel panel is above the ceiling line.

**Assessment**

- The failure of the anodized finish on the aluminum replacement windows has a negative visual impact on the courthouse, but in and of itself does not indicate that the windows are failing or in need of immediate replacement. While no leakage was noted, it is expected and has likely been mitigated due to vigilant maintenance.
- The age of the windows (30+ years) does raise concerns about continued serviceability, availability of compatible replacement parts, and the likelihood of increased seal failure on the insulated glazing units.
- Modern units tend to be more energy efficient as the frames can be thermally broken.
- The use of solar bronze or other color coated glazing are prohibited in historic structures unless originally designed with that type of glass. Typically, only a Low E glass with a transmittance of greater than .85 is permitted.

**Items for Consideration**

- If windows are replaced, new window treatments will be required. The reglazing of the half round window tops presents a challenge for window treatments. They could be left open, provided with a permanent window treatment, or a roller shade on the wall sized to cover the entire opening may be an option.

## D. Limited Mechanical Condition Assessment

### INTENT

The County is planning to replace the VAV boxes, valves, and controls. A discussion with Public Works staff regarding the greater mechanical system was undertaken along with a review of the 1984 Heating, Ventilation, & Air Conditioning Projects drawings to ensure the overall scope of the proposed work is appropriate and includes the necessary items while giving due consideration to associated items that may impact or be impacted by the proposed scope and thereby reduce its effectiveness. This is a "best" approach and it is acknowledged that funding and operations may require the adoption of the recommendations in phases based on a "good" or "better" approach.

### HEATING PLANT

#### Observations

The facility currently receives hot water for heating from a steam to hot water heat exchanger within a local utility pump house. The utility steam is metered at the courthouse and the hot water distributed throughout the facility. There is an existing hot water boiler plant that is used for backup upon the rare occasions when the utility hot water cannot meet the facility demand. The hot water distribution piping serves a built-up air handling unit located in the basement, an air handling unit on the second floor and terminal units throughout the facility. The terminal units are utilized around the perimeter of the building and Variable Air Volume (VAV) Boxes are utilized for individual areas on each floor for temperature zone control. The terminal units consist of hot water fin pipe, cabinet unit heaters and convectors. The existing hot water boilers have met their average life expectancy of 25 years and the pumps of 20 years. However due to the infrequency of use and continuous preventative maintenance, replacement of the equipment should only be necessary as it fails.

#### Assessment

The existing boiler plant has exceeded its life expectancy of 25 years, however, due to its infrequent use and reported preventative maintenance, it may continue to serve the facility for a couple more years. Consideration should be given to its eventual replacement. When it is replaced, the entire plant will need to be updated.

### AIR HANDLING SYSTEM

#### Observations

The air handling system consists of a built-up air handling unit located in the basement. The air handling unit is comprised of a supply air fan, (2) DX cooling coils, and a hot water heating coil. Each DX coil has a remote air cooled compressor-condensing unit located outside. Air is distributed throughout the facility to Variable Air Volume Boxes (VAV) in zones on each floor. There are approximately 62 VAV boxes and 1 fan powered VAV box with hot water reheat. Due to their location within a facility, built-up air handling units are often difficult to remove. Therefore, it is very common for the individual components within the air handling unit be replaced leaving the equipment casing intact. If it is determined that replacing the air handling unit is not a viable option, the replacement of the internal components may be the only viable option.

There is an additional indoor air handling unit serving the second floor courtroom and adjacent offices. The air handling unit is a 3-zone constant volume multizone system and is comprised of a supply air fan, DX cooling coil, and a hot water heating coil. The unit utilizes pneumatic controls. The DX coil has a remote air cooled compressor-condensing unit located on grade that is currently being replaced. Systems of this type have an average life expectancy of 20-25 years.

#### Assessment

##### Built-up Air Handling Unit

- Discussions with Manitowoc County Public Works staff indicated a possible issue with the air handling unit's fan and motor not being able to properly modulate the fan. This may be the result of the existing fan and motor not being fully compatible with the more recently installed variable frequency drive and therefore not compatible with the overall existing VAV system or the proposed new VAV system. A balancing contractor is needed to undertake test and balance study to provide greater insight.
- VAV boxes with pneumatic controls have an average life expectancy of 20 years. As the majority of the existing units were installed in 1984, the equipment has met or exceeded this average and their replacement is warranted. As the entire VAV box and associated valves are to be replaced, the planned conversion of equipment controls from pneumatic to DDC to match the previous conversions elsewhere in the building is appropriate.

**Second Floor Courtroom Air Handling Unit**

- The indoor air handling unit has exceeded its life expectancy and plans should be made for immediate replacement.
- The Manitowoc County Public Works staff is in the process of replacing the chillers for the Courthouse's HVAC system. To take full advantage of the new system and provide adequate air supply and cooling capabilities for the Main Courtroom and the associated offices, replacement of the existing Courtroom AHU is warranted.
- The existing AHU is hidden in an interstitial space just above the offices and can only be fully serviced by crawling into the furthest corners of that space.
- A pneumatic control system manages the HVAC system.

**CONTROLS****Observations**

The existing building controls system is a combination of Siemens DDC (Direct Digital Controls) and pneumatic controls.

**Assessment**

Pneumatic controls are an outdated technology that are difficult to maintain and the availability of technicians with knowledge of the systems is becoming scarce. In addition, the tubing and fittings notoriously leak causing the air compressor to cycle on more frequently using unnecessary energy and further reducing the life expectancy of the equipment.

*Intentionally left blank.*

### III. WORK RECOMMENDATIONS

#### A. Tower

##### RECOMMENDATION

A full repair of the tower structure and restoration of the tower exterior cladding and ornamentation is recommended. Restoration would include the recladding the tower in copper, recreation of missing or previously simplified copper ornamentation, redesign of the dome lantern to maintain a flagpole while returning to the original historic lantern design, recladding of the tower dome in copper or glass, and the replacement of the tower windows. The scope of work is outlined in the Architectural Scope Drawings, sheets A205 through A502, and is further described as follows:

##### WORK TASKS

###### Documentation And Removal Of Existing Exterior Cladding And Ornamentation

1. For the purposes of restoring the tower to its original constructed appearance, the copper clad exterior of the tower, from the promenade deck through the flag pole shall be fully documented as material is removed to facilitate repairs and replication of the original cladding and ornament. This work shall include:
  - a. Documentation of cladding and ornament profiles and dimensions, number and locations, thickness of material.
  - b. Collect examples of all existing original ornamentation for use as patterns.
  - c. Collect examples of all existing modified or simplified replacement ornamentation for the purposes of informing the size of historical ornamentation to be recreated from historical photos and drawings.
  - d. Document methods of attachment, including types, construction, and profiles of armatures and backing to assist in the replication and attachment of the replicated historical cladding and ornament.
  - e. Document location and condition of building structure and infill used for attachment points.
2. At the stainless steel clad dome, for purposes of recladding dome in copper or glass:
  - a. Document dimensions stainless of the stainless steel dome cladding.
  - b. Document the size and profiles of the copper clad dome glazing armature.
  - c. Document size and location of glazing armature and armature attachments back to structural.
3. Inspect and assess the tower steel structure, bracing, floor trusses and decking, dome glazing armature, access ladders and stair. Document size and condition to assist in the repair or replacement of deteriorated or damaged elements, both noted and found.
4. At top of the clerestory, remove structural clay tile immediately adjacent to all (8) columns to a level 8' down to reveal the embedded portions of columns as part of the structural assessment process.

###### Structural Repairs And Preparation

1. Repair all structural steel, bracing, dome glazing armature, access ladders and stairs as required. Specific repairs include:
  - a. At lantern repairs to roof framing and tops of columns are expected.
  - b. At two dome trusses reinforce or replace 5' lineal feet of the back to back steel angle top chord.
  - c. At three additional dome trusses reinforce 4' of back to back steel angle top chord.
  - d. At top of clerestory, corrosion sufficient to require reinforcing of column to truss connections at the base of the 8 dome trusses is expected.
2. Blast clean all exposed steel. Provide additional line item cost for lead abatement should existing steel coating be found to contain lead.
3. Prime and paint all exposed steel structure, bracing, floor trusses and decking, dome glazing armature, access ladders and stair with an organic zinc primer and double top coat of acrylic top coat (dark grey or black, matt finish, light grey at underside of dome floor deck, matt finish). Assume Tnemec protective coatings as the basis of design.
4. Inspect the exposed structural clay tile and:
  - a. Repoint cracked or deteriorated joints with lime mortar to match original formulation.
  - b. Provide mortar repair or cracked or broken tile where appropriate and replace where tile has spalled out or broken beyond repair.
  - c. Provide toothed in structural clay tile infill (not CMU) at areas that were removed for steel inspection.

###### Clerestory Access And Debris Screen

1. Remove existing woven wire mesh debris screen to facilitate prepping and repainting of structural steel.
2. Following repainting of steel, provide new PVC coated 5/8" Mesh with .063" diameter wire, 80.9% open and wire together all seams.

- b. **OPTION – Dome Drum Cornice Lighting (see sheet A501):** Replace the 72 abandoned surface mounted bare bulb sockets between modillions at underside of cornice at base of atrium dome with fiber optic system:
  - i. Provide fiber optic remote LED light source(s) in attic in attic.
  - ii. Provide fiber optic cables from remote light source(s), through wall of atrium dome drum and run along top side of dome drum cornice.
  - iii. At each existing light fixture location between cornice modillions, drill through plaster and wood framed cornice and extend fiber optic cable through cornice to underside and terminate with fiber optic end fixture that simulates light spread of bare bulb. Secure end fixture to cornice and patch plaster and touchup paint as required.

## C. Courthouse Windows

### RECOMMENDATION

Replacement of aluminum framed courthouse windows is recommended and window sash to be returned to original layout unless noted otherwise. The scope of work is outlined in the Architectural Scope Drawings, sheets A204 and A501, HVAC Scope Drawing HV-3, and is further described as follows:

### WORK TASKS

#### Removal & Preparation

1. Remove existing abandoned louvers and ductwork.
2. Relocate existing louvers and ductwork to locations indicated on sheets A401 through A404.
3. Remove existing aluminum window system and clean sealant off stonework.

#### Replacement Scope

1. Provide new thermally broken aluminum window system, simulated double hung unless noted otherwise. Single windows to be returned to double sash, no transom unless noted otherwise. Paired windows to maintain transoms and to be glazed.
2. At the north elevation, second floor, center bay, remove masonry infill abandoned windows and provide paired windows with glazed transoms to match style of adjacent openings. Provide interior transparent finished oak wood trim, sill, skirt to match original profiles.
3. Provide manually controlled roller shades at all windows.
  - a. At square topped openings (single and paired windows) set roller shade in window opening.
  - b. At round top windows fur out roller shades to be flush with face of trim on wall with shades width of trim surround.
4. At first floor windows in rooms with dropped ceilings, create painted GWB recessed lightwells 2' wider than window opening, 4' back from wall, 3'-6" above dropped ceiling. Relocate lay-in 2x4 light fixtures where required.
5. At second and third floor windows in rooms with dropped ceilings, create painted GWB recessed lightwell 2' wider than window opening, 4' back from wall, 2'-6" above dropped ceiling. Relocate lay-in 2x4 light fixtures where required.

## D. Heating Plant

### RECOMMENDATION

For the purposes of the cost estimate portion of this report, there is no Heating Plant scope. The following recommendations are provided as a guide for when the County does wish to pursue the boiler replacement.

### WORK TASKS

#### Replacement Scope – When Needed

1. The new boiler plant should be high efficiency sealed combustion. A condensing boiler can be considered if the reheat coils within the existing equipment are sized appropriately to support a lower entering water temperature. This can be determined with further investigation.
2. Install piping insulation and replace all missing and/or damaged insulation.
3. Cap combustion air intake louver/cap with an insulated sheet metal panel, sealed weathertight.
4. Inspect the existing chimney to verify adequate size and condition to accommodate the new boiler vent and intake.

5. Install controls to integrate direct digital control (DDC) with the existing building automation system for the new boiler plant. The control logic shall include hot water reset, pressure differential reset and scheduled occupied/unoccupied operation. The boiler control panel shall energize and modulate the boiler system pump(s). The DDC programmed sequence shall modulate the bypass valve(s) as required to maintain return water temperature as determined by the reset schedule. All existing heating terminal units shall be inspected for proper operation. New isolation and control valves shall be installed if required and integrated to the DDC sequence.

## E. Built-Up Air Handling Unit

### RECOMMENDATION

Replacement of the VAV boxes and associated valves, and the upgrade of controls to DDC is recommended.

### WORK TASKS

The scope of work for the replacement of VAVs, valves, and controls related to the Built-up Air Handling Unit is outlined in the HVAC Scope Drawings, sheets HV-1 through HV-5, and is further described below.

#### Preparation

1. Prior to the equipment replacement, engage a qualified contractor to perform a pre-construction test and balance to record the existing total supply air, return air and outdoor air at the air handling unit. In addition, the balancing contractor should measure and record the air volume at each supply, return and exhaust air grille/register.
2. Inspect the existing supply fan, motor, and drive to determine if it is compatible with today's more efficient VAV systems. For the purposes of the cost estimation portion of this report, assume that the existing motor and drive are not fully compatible should be replaced. Provide a fan array comprised of multiple smaller direct drive fans with EC motors. They utilize a smaller section of the air handling unit which makes the installation easier, and because they are direct drive EC motors it eliminates the need for the VFD which can be removed.
3. Inspect and clean the air handling unit hot water heating coil with a high concentration of detergent and water. Inspect the isolation, balancing and control valves for proper operation. For the purposes of cost estimating portion of this report assume replacement is required.

#### Replacement

1. Replace all VAV boxes and valves in their entirety. Remove the existing pneumatic control system and replace with DDC controls to match the previously converted DDC system in the building.
  - a. All new equipment should be furnished and installed with Direct Digital Controls (DDC) and fully integrated into the existing Building Automation System. Provide networking to DDC equipment using current communication standards according to ASHRAE standard ANSI/ASHRAE 135 for interoperability with smart equipment and for the main BACnet/IP communication trunk to the BAS Server.
2. Inspect and clean all ductwork, repairing and replacing as required.

## F. Indoor Air Handling Unit

### RECOMMENDATION

Replacement of the existing AHU with two separate AHUs is recommended.

### WORK TASKS

The scope of work for the replacement of second floor courtroom Indoor Air Handling Unit is outlined in the HVAC Scope Drawings, sheet HV-3, and is further described below.

#### Preparation

1. Prior to the equipment replacement, perform a pre-construction test and balance to record the existing total supply air, return air and outdoor air at the air handling unit.
2. The balancing contractor to also measure and record the air volume at each supply, return and exhaust air grille/register.

**Replacement**

1. When replaced, (2) units should be installed. (1) unit shall be a single zone VAV unit comprised of an EC fan motor and/or fan array, hot water heating coil with a modulating control valve, DX cooling coil, economizer for free cooling and DDC. The system shall be controlled to meet the temperature setpoint within the room and shall serve the existing courtroom. (1) unit shall be a multizone variable air volume and consist of an EC fan motor and/or fan array, hot water heating coil with a modulating control valve, DX cooling coil and DDC. VAV boxes with hot water reheat shall be utilized within each space downstream of the air handling unit and shall be controlled to meet the temperature setpoint within each space. This unit shall serve the offices adjacent to the courtroom. Both units shall be installed on a on the existing mechanical platform, to be modified as needed, above the court offices. Special care to be given to placement for sound and vibration sensitive applications as the modified mechanical platform will be open to the courtroom. The condensing units shall be installed outdoors on grade and shall contain at least one digital scroll compressor or hot gas bypass.
2. Rework or replace existing ductwork as required to separate the courtroom ductwork from the office ductwork. All ductwork shall be insulated. Existing ductwork insulation to remain to be repaired or replaced as required. Provide sound boots at Jury Room, two private offices, and the open office.
3. All new equipment should be furnished and installed with Direct Digital Controls (DDC) and fully integrated into the existing Building Automation System. Provide networking to DDC equipment using current communication standards according to ASHRAE standard ANSI/ASHRAE 135 for interoperability with smart equipment and for the main BACnet/IP communication trunk to the BAS Server.



**IV. CONCEPTUAL ESTIMATES SUMMARY**

**A. Conceptual Estimates Comparison**

Projects	Recommended Contingency	Conceptual Estimates		
		Concord Group (Start 1st Q 2024)	JP Cullen (Bid 3rd Q 2022)	JPC - Adjusted* (Start 1st Q 2024)
<b>Tower Restoration</b>				
Estimated Construction Cost		\$ 9,703,889.00	\$ 16,383,476.44	\$ 18,595,245.76
Construction Contingency	15.00%	\$ 1,455,583.35	\$ 2,457,521.47	\$ 2,789,286.86
<b>Total Estimated Construction Costs</b>		<b>\$ 11,159,472.35</b>	<b>\$ 18,840,997.91</b>	<b>\$ 21,384,532.62</b>
<b>Alternates</b>				
Reglaze Dome		\$ 684,766.00	\$ (41,651.49)	\$ (47,274.44)
Replace Tower Base Lighting		\$ 72,942.00	\$ 339,293.31	\$ 385,097.91
Lightning Protection System		\$ 142,617.00	\$ 141,136.98	\$ 160,190.47
<b>Total Alternate Budget</b>		<b>\$ 900,325.00</b>	<b>\$ 438,778.80</b>	<b>\$ 498,013.94</b>
<b>Interior Dome Restoration</b>				
Estimated Construction Cost		\$ 1,971,355.00	\$ 1,209,169.13	\$ 1,372,406.96
Construction Contingency	10.00%	\$ 197,135.50	\$ 120,916.91	\$ 137,240.70
<b>Total Estimated Construction Costs</b>		<b>\$ 2,168,490.50</b>	<b>\$ 1,330,086.04</b>	<b>\$ 1,509,647.66</b>
<b>Alternates</b>				
Cornice Lighting System		\$ 98,847.00	\$ 174,528.73	\$ 198,090.11
<b>Total Alternate Budget</b>		<b>\$ 98,847.00</b>	<b>\$ 174,528.73</b>	<b>\$ 198,090.11</b>
<b>Courthouse Exterior Windows</b>				
Estimated Construction Cost		\$ 4,657,059.00	\$ 1,443,237.76	\$ 1,638,074.86
Construction Contingency	10.00%	\$ 465,705.90	\$ 144,323.78	\$ 163,807.49
<b>Total Estimated Construction Costs</b>		<b>\$ 5,122,764.90</b>	<b>\$ 1,587,561.54</b>	<b>\$ 1,801,882.34</b>
<b>VAV, Valve, and Controls Replacement</b>				
Estimated Construction Cost		\$ 1,378,915.00	\$ 1,018,318.49	\$ 1,155,791.49
Construction Contingency	10.00%	\$ 137,891.50	\$ 101,831.85	\$ 115,579.15
<b>Total Estimated Construction Costs</b>		<b>\$ 1,516,806.50</b>	<b>\$ 1,120,150.34</b>	<b>\$ 1,271,370.63</b>
<b>Main Courthouse AHU &amp; Controls Replacement</b>				
Estimated Construction Cost		\$ 1,030,457.00	\$ 365,044.33	\$ 414,325.31
Construction Contingency	10.00%	\$ 103,045.70	\$ 36,504.43	\$ 41,432.53
<b>Total Estimated Construction Costs</b>		<b>\$ 1,133,502.70</b>	<b>\$ 401,548.76</b>	<b>\$ 455,757.85</b>
<b>Sub Total (No Alternates)</b>		<b>\$ 21,101,036.95</b>	<b>\$ 23,280,344.59</b>	<b>\$ 26,423,191.11</b>
<b>Total (With Alternates)</b>		<b>\$ 22,100,208.95</b>	<b>\$ 23,893,652.12</b>	<b>\$ 27,119,295.15</b>

\* JP Cullen did not have an opinion as to cost escalation for 1st Q 2024 given the unpredictability of the current economy, therefore the 13.5% used by Concord was applied.

See Appendix A for the detailed Conceptual Estimate provided by the Concord Group and Appendix B for the detailed Conceptual Estimate provided by JP Cullen.

*Intentionally left blank.*

**APPENDIX B. CONCORD GROUP: CONCEPTUAL ESTIMATE BACKUP**





55 East Monroe Street  
Suite 2850  
Chicago, IL 60603  
312.424.0250 T  
[www.concord-cc.com](http://www.concord-cc.com)

# Manitowoc County Courthouse County Dome & Facility Improvements Study

1010 S. 8th St.  
Manitowoc, WI 54220

## Conceptual Estimate

May 25, 2022

**DRAFT**

Project: 2021A081

### Prepared For:

Strang  
811 E. Washington Ave.  
Madison, WI 53703

### NOTES REGARDING PREPARATION OF ESTIMATE

This estimate was prepared based on the following documents provided by Strang:

1. Concept Design Pricing Package received May 02, 2022.
2. Information regarding the project was also obtained via meetings, phone conversations, and email messages that clarified the project scope.

### BIDDING PROCESS - MARKET CONDITIONS

This document is based on the measurement and pricing of quantities wherever information is provided and/or reasonable assumptions for other work not covered in the drawings or specifications, as stated within this document. Unit rates have been generated from current material/labor rates, historical production data, and discussions with relevant subcontractors and material suppliers. The unit rates reflect current bid costs in the area. All unit rates relevant to subcontractor work include the subcontractors overhead and profit unless otherwise stated.

Pricing reflects probable construction costs obtainable in the Manitowoc, Wisconsin area on the bid date. This estimate is a determination of fair market value for the construction of this project. It is not a prediction of low bid. Pricing assumes competitive bidding for every portion of the construction work for all subcontractors with a minimum of 3 bidders for all items of subcontracted work and a with a minimum of 3 bidders for a general contractor. Experience indicates that a fewer number of bidders may result in higher bids, conversely an increased number of bidders may result in more competitive bids.

Since The Concord Group has no control over the cost of labor, material, equipment, or over the contractor's method of determining prices, or over the competitive bidding or market conditions at the time of bid, this statement of probable construction cost is based on industry practice, professional experience and qualifications, and represents The Concord Group's best judgment as professional construction cost consultants familiar with the construction industry. However, The Concord Group cannot and does not guarantee that the proposals, bids, or the construction cost will not vary from opinions of probable cost prepared by them.

### CURRENT MARKET CONDITIONS

It should be noted that there is ongoing volatility in the construction materials market due to the effects of the pandemic on both the production and supply of materials. Due to the lack of in stock materials suppliers are struggling to fulfill orders in a timely manner, which in turn leads to much longer than normal lead times. The impact of ongoing global raw material shortages and fuel price increases adds to the overall spike in material pricing coupled with the increased demand for construction that the construction industry is now seeing. These factors should be considered when determining the bidding strategy and schedule for projects.

### ASSUMED CONSTRUCTION PARAMETERS

The pricing is based on the following project parameters:

1. A bid opening date of Q1, 2024.
2. The contract will be competitively bid to multiple contractors.
3. All contractors will be required to pay prevailing wages.
4. There are phasing requirements.
5. The contractors will have full access to the site during normal working hours
6. Estimate detail includes pricing as of May 2022.

### **EXCLUSIONS**

The following are excluded from the cost of this estimate:

1. Professional Design Fees
2. Testing Fees
3. Owner Contingencies/Scope Changes
4. Premium Time / Restrictions on Contractor Working Hours
5. Cost Escalation Beyond a Start Date of Q1 2024
6. Finance and Legal Charges
7. Temporary Owner Facilities
8. Equipment (Owner Furnished/Installed)
9. Loose Furniture
10. Third Party Commissioning
11. Future Cost Impacts Based on Supply Chain Impacts

**COST SUMMARY**

	<b>BUILDING TOTAL</b>
TOWER RESTOTATION	\$10,674,278
ATRIUM INTERIOR DOME RESTORATION	\$2,168,490
EXTERIOR WINDOW REPLACEMENT	\$5,122,765
VAV/VALVE REPLACEMENT W/ PNEUMATIC CONTROL CONVERSION	\$1,516,806
REPLACEMENT OF 2ND FLOOR COURTRROMM INTERIOR AHU	\$1,030,457
<b>TOTAL ESTIMATED CONSTRUCTION COSTS</b>	<b>\$20,512,797</b>

**ALTERNATES**

<u>Alternate #1</u> : Clad tower dome in glass in lieu of copper panels	<b>ADD</b>	\$684,766
<u>Alternate #2</u> : Upgrade of tower exterior architectural lighting	<b>ADD</b>	\$72,942
<u>Alternate #3</u> : Tower lightning protection system	<b>ADD</b>	\$142,617
<u>Alternate #4</u> : Dome drum cornice light fixture replacement	<b>ADD</b>	\$98,847





**Manitowoc County Courthouse  
County Dome & Facility Improvements  
Study**

Conceptual Estimate  
05/25/2022  
DRAFT

TOWER RESTORATION		BUILDING TOTAL
<b>01000</b>	GENERAL REQUIREMENTS	\$1,788,545
<b>02000</b>	EXISTING CONDITIONS	\$440,510
<b>03000</b>	CONCRETE	\$0
<b>04000</b>	MASONRY	\$164,344
<b>05000</b>	METALS	\$400,020
<b>06000</b>	WOODS, PLASTICS & COMPOSITES	\$0
<b>07000</b>	THERMAL & MOISTURE PROTECTION SYSTEM	\$1,919,289
<b>08000</b>	OPENINGS	\$865,633
<b>09000</b>	FINISHES	\$0
<b>10000</b>	SPECIALTIES	\$0
<b>11000</b>	EQUIPMENT	\$0
<b>12000</b>	FURNISHINGS	\$0
<b>13000</b>	SPECIAL CONSTRUCTION	\$0
<b>14000</b>	CONVEYING EQUIPMENT	\$0
<b>21000</b>	FIRE SUPPRESSION	\$0
<b>22000</b>	PLUMBING	\$0
<b>23000</b>	HEATING, VENTILATING & AIR CONDITIONING	\$0
<b>26000</b>	ELECTRICAL	\$35,079
<b>27000</b>	COMMUNICATIONS	\$0
<b>28000</b>	ELECTRONIC SAFETY AND SECURITY	\$0
<b>31000</b>	EARTHWORK	\$0
<b>32000</b>	EXTERIOR IMPROVEMENTS	\$0
<b>33000</b>	UTILITIES	\$0
<b>SUBTOTAL</b>		<b>\$5,613,421</b>
	DESIGN CONTINGENCY	15.0% \$842,013
	GENERAL CONDITIONS/BOND/INSURANCE	25.0% \$1,613,858
	CONTRACTOR'S FEES	6.0% \$484,158
	ESCALATION TO MID-POINT OF CONSTRUCTION	13.5% \$1,150,439
<b>TOTAL ESTIMATED BID</b>		<b>\$9,703,889</b>
	CONSTRUCTION CONTINGENCY	10.0% \$970,389
<b>TOTAL ESTIMATED CONSTRUCTION COSTS</b>		<b>\$10,674,278</b>
<b>ALTERNATES</b>		
	<u>Alternate #1:</u> Clad tower dome in glass in lieu of copper panels	<b>ADD</b> \$684,766
	<u>Alternate #2:</u> Upgrade of tower exterior architectural lighting	<b>ADD</b> \$72,942
	<u>Alternate #3:</u> Tower lightning protection system	<b>ADD</b> \$142,617

ATRIUM INTERIOR DOME RESTORATION		BUILDING TOTAL
01000	GENERAL REQUIREMENTS	\$153,864
02000	EXISTING CONDITIONS	\$173,873
03000	CONCRETE	\$0
04000	MASONRY	\$16,582
05000	METALS	\$63,880
06000	WOODS, PLASTICS & COMPOSITES	\$150,939
07000	THERMAL & MOISTURE PROTECTION SYSTEM	\$0
08000	OPENINGS	\$175,893
09000	FINISHES	\$0
10000	SPECIALTIES	\$8,835
11000	EQUIPMENT	\$0
12000	FURNISHINGS	\$0
13000	SPECIAL CONSTRUCTION	\$0
14000	CONVEYING EQUIPMENT	\$13,806
21000	FIRE SUPPRESSION	\$0
22000	PLUMBING	\$0
23000	HEATING, VENTILATING & AIR CONDITIONING	\$278,782
26000	ELECTRICAL	\$19,446
27000	COMMUNICATIONS	\$0
28000	ELECTRONIC SAFETY AND SECURITY	\$0
31000	EARTHWORK	\$0
32000	EXTERIOR IMPROVEMENTS	\$0
33000	UTILITIES	\$0
<b>SUBTOTAL</b>		<b>\$1,055,900</b>
	DESIGN CONTINGENCY	15.0% \$158,385
	GENERAL CONDITIONS/BOND/INSURANCE	35.0% \$425,000
	CONTRACTOR'S FEES	6.0% \$98,357
	ESCALATION TO MID-POINT OF CONSTRUCTION	13.5% \$233,713
<b>TOTAL ESTIMATED BID</b>		<b>\$1,971,355</b>
	CONSTRUCTION CONTINGENCY	10.0% \$197,135
<b>TOTAL ESTIMATED CONSTRUCTION COSTS</b>		<b>\$2,168,490</b>
<b>ALTERNATES</b>		
	Alternate #4: Dome drum cornice light fixture replacement	ADD \$98,847



EXTERIOR WINDOW REPLACEMENT		BUILDING TOTAL
<b>01000</b>	GENERAL REQUIREMENTS	\$0
<b>02000</b>	EXISTING CONDITIONS	\$448,676
<b>03000</b>	CONCRETE	\$0
<b>04000</b>	MASONRY	\$16,023
<b>05000</b>	METALS	\$0
<b>06000</b>	WOODS, PLASTICS & COMPOSITES	\$0
<b>07000</b>	THERMAL & MOISTURE PROTECTION SYSTEM	\$0
<b>08000</b>	OPENINGS	\$1,722,077
<b>09000</b>	FINISHES	\$402,698
<b>10000</b>	SPECIALTIES	\$0
<b>11000</b>	EQUIPMENT	\$0
<b>12000</b>	FURNISHINGS	\$59,925
<b>13000</b>	SPECIAL CONSTRUCTION	\$0
<b>14000</b>	CONVEYING EQUIPMENT	\$0
<b>21000</b>	FIRE SUPPRESSION	\$0
<b>22000</b>	PLUMBING	\$0
<b>23000</b>	HEATING, VENTILATING & AIR CONDITIONING	\$29,576
<b>26000</b>	ELECTRICAL	\$15,000
<b>27000</b>	COMMUNICATIONS	\$0
<b>28000</b>	ELECTRONIC SAFETY AND SECURITY	\$0
<b>31000</b>	EARTHWORK	\$0
<b>32000</b>	EXTERIOR IMPROVEMENTS	\$0
<b>33000</b>	UTILITIES	\$0
<b>SUBTOTAL</b>		<b>\$2,693,975</b>
	DESIGN CONTINGENCY	15.0% \$404,096
	GENERAL CONDITIONS/BOND/INSURANCE	25.0% \$774,518
	CONTRACTOR'S FEES	6.0% \$232,355
	ESCALATION TO MID-POINT OF CONSTRUCTION	13.5% \$552,115
<b>TOTAL ESTIMATED BID</b>		<b>\$4,657,059</b>
	CONSTRUCTION CONTINGENCY	10.0% \$465,706
<b>TOTAL ESTIMATED CONSTRUCTION COSTS</b>		<b>\$5,122,765</b>

VAV/VALVE REPLACEMENT W/ PNEUMATIC CONTROL CONVERSION		BUILDING TOTAL	
01000	GENERAL REQUIREMENTS	\$0	
02000	EXISTING CONDITIONS	\$75,000	
03000	CONCRETE	\$0	
04000	MASONRY	\$0	
05000	METALS	\$0	
06000	WOODS, PLASTICS & COMPOSITES	\$0	
07000	THERMAL & MOISTURE PROTECTION SYSTEM	\$0	
08000	OPENINGS	\$0	
09000	FINISHES	\$0	
10000	SPECIALTIES	\$0	
11000	EQUIPMENT	\$0	
12000	FURNISHINGS	\$0	
13000	SPECIAL CONSTRUCTION	\$0	
14000	CONVEYING EQUIPMENT	\$0	
21000	FIRE SUPPRESSION	\$0	
22000	PLUMBING	\$0	
23000	HEATING, VENTILATING & AIR CONDITIONING	\$662,977	
26000	ELECTRICAL	\$600	
27000	COMMUNICATIONS	\$0	
28000	ELECTRONIC SAFETY AND SECURITY	\$0	
31000	EARTHWORK	\$0	
32000	EXTERIOR IMPROVEMENTS	\$0	
33000	UTILITIES	\$0	
<b>SUBTOTAL</b>		<b>\$738,577</b>	
	DESIGN CONTINGENCY	15.0%	\$110,786
	GENERAL CONDITIONS/BOND/INSURANCE	35.0%	\$297,277
	CONTRACTOR'S FEES	6.0%	\$68,798
	ESCALATION TO MID-POINT OF CONSTRUCTION	13.5%	\$163,476
<b>TOTAL ESTIMATED BID</b>		<b>\$1,378,915</b>	
	CONSTRUCTION CONTINGENCY	10.0%	\$137,891
<b>TOTAL ESTIMATED CONSTRUCTION COSTS</b>		<b>\$1,516,806</b>	



REPLACEMENT OF 2ND FLOOR COURTROOM INTERIOR AHU		BUILDING TOTAL
<b>01000</b>	GENERAL REQUIREMENTS	\$0
<b>02000</b>	EXISTING CONDITIONS	\$30,000
<b>03000</b>	CONCRETE	\$0
<b>04000</b>	MASONRY	\$0
<b>05000</b>	METALS	\$0
<b>06000</b>	WOODS, PLASTICS & COMPOSITES	\$0
<b>07000</b>	THERMAL & MOISTURE PROTECTION SYSTEM	\$0
<b>08000</b>	OPENINGS	\$0
<b>09000</b>	FINISHES	\$0
<b>10000</b>	SPECIALTIES	\$0
<b>11000</b>	EQUIPMENT	\$0
<b>12000</b>	FURNISHINGS	\$0
<b>13000</b>	SPECIAL CONSTRUCTION	\$0
<b>14000</b>	CONVEYING EQUIPMENT	\$0
<b>21000</b>	FIRE SUPPRESSION	\$0
<b>22000</b>	PLUMBING	\$0
<b>23000</b>	HEATING, VENTILATING & AIR CONDITIONING	\$454,959
<b>26000</b>	ELECTRICAL	\$16,800
<b>27000</b>	COMMUNICATIONS	\$0
<b>28000</b>	ELECTRONIC SAFETY AND SECURITY	\$0
<b>31000</b>	EARTHWORK	\$0
<b>32000</b>	EXTERIOR IMPROVEMENTS	\$0
<b>33000</b>	UTILITIES	\$0
<b>SUBTOTAL</b>		<b>\$501,759</b>
	DESIGN CONTINGENCY	15.0% \$75,264
	GENERAL CONDITIONS/BOND/INSURANCE	35.0% \$201,958
	CONTRACTOR'S FEES	6.0% \$46,739
	ESCALATION TO MID-POINT OF CONSTRUCTION	13.5% \$111,059
<b>TOTAL ESTIMATED BID</b>		<b>\$936,779</b>
	CONSTRUCTION CONTINGENCY	10.0% \$93,678
<b>TOTAL ESTIMATED CONSTRUCTION COSTS</b>		<b>\$1,030,457</b>

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
<b>BASE BID</b>				
<b>TOWER RESTOTATION</b>				
<b>01000 GENERAL REQUIREMENTS</b>				
<b>01600 Construction Access</b>				
Hoisting & Access - Allowance	18	MNTH	50,000.00	900,000
Tubular scaffolds - exterior	19,000	SQFT	16.47	312,862
Tubular scaffolds - interior	10,000	SQFT	19.23	192,330
Winter conditions including tenting & heat	6	MTHS	50,000.00	300,000
<b>Subtotal: Construction Access</b>				<b>\$1,705,192</b>
<b>01900 Miscellaneous General Requirements</b>				
Document all profiles, dimensions, locations, thicknesses, connections etc. as material is being removed. Collect examples for original ornamentation	640	HRS	130.24	83,354
<b>Subtotal: Miscellaneous General Requirements</b>				<b>\$83,354</b>
<b>TOTAL: GENERAL REQUIREMENTS</b>				<b>\$1,788,545</b>
<b>02000 EXISTING CONDITIONS</b>				
<b>02100 Selective Demolition</b>				
Remove & salvage roof pavers	1,355	SQFT	5.42	7,351
Remove copper cladding & backing, blocking, armatures, moldings, raised panels, swags etc.	5,665	SQFT	15.11	85,603
Remove dome cladding panels & ornamental ribs	1,571	SQFT	17.00	26,706
Remove window, 6'-6"x10'-9"	4	EACH	1,016.88	4,068
Remove window, 5'-6"x10'-9"	8	EACH	1,016.88	8,135
Remove window, half round, 5'-6"x2'-6"	8	EACH	508.44	4,068
Remove window, half round, 6'-4"x3'-2"	4	EACH	508.44	2,034
<b>Subtotal: Selective Demolition</b>				<b>\$137,963</b>
<b>02200 Environmental Abatement</b>				
Lead based paint abatement allowance	1	LSUM	150,000.00	150,000
<b>Subtotal: Environmental Abatement</b>				<b>\$150,000</b>
<b>02800 Temporary Construction</b>				
Protect balustrade	153	LNFT	114.65	17,541
Protect balustrade corner pieces	4	EACH	881.44	3,526
Protect existing roof	1,355	SQFT	5.84	7,920
Temporary shoring system to support scaffolding/deck	1,894	SQFT	27.06	51,259
Temporary shoring system to support scaffolding/deck	1,894	SQFT	16.50	31,258
Remove temporary protection at balustrade	153	LNFT	81.72	12,503
Protect balustrade corner pieces	4	EACH	595.96	2,384
Protect existing roof	1,355	SQFT	3.58	4,845
Temporary shoring system to support scaffolding/deck	1,894	SQFT	11.25	21,311
<b>Subtotal: Temporary Construction</b>				<b>\$152,547</b>
<b>TOTAL: EXISTING CONDITIONS</b>				<b>\$440,510</b>

**04000 MASONRY**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
<b>04900 Miscellaneous Masonry</b>				
Remove top 8'-0" of structural clay tile at column for structural repair	8	EACH	3,836.55	30,692
Tooth in replacement structural clay tile	8	EACH	5,115.68	40,925
Tuckpoint deteriorated structural clay tile joints. Replace damaged tile	6,355	SQFT	14.59	92,726
<b>Subtotal: Miscellaneous Masonry</b>				<b>\$164,344</b>
<b>TOTAL: MASONRY</b>				<b>\$164,344</b>
<b>05000 METALS</b>				
<b>05100 Structural Steel</b>				
Remove & replace top 6'-0" of steel column & connection to dome truss....	8	EACH	8,017.50	64,140
Catwalk, 32" wide w/ guardrails	383	SQFT	209.00	80,046
Replace corroded curved steel ribs at lantern	8	EACH	6,713.13	53,705
Sister or splice in top chords of dome truss	7	EACH	5,438.57	38,070
<b>Subtotal: Structural Steel</b>				<b>\$235,961</b>
<b>05500 Metal Restoration &amp; Cleaning</b>				
Blast existing clerestory structure & deck. Inspect, prime & paint w/ high performance coating	2,683	SQFT	23.26	62,408
Blast existing dome, lantern & glazing armature/structure. Inspect, prime & paint w/ high performance coating	3,020	SQFT	26.77	80,838
Blast, prime & paint existing stair to dome	1	EACH	10,793.09	10,793
<b>Subtotal: Metal Restoration &amp; Cleaning</b>				<b>\$154,039</b>
<b>05900 Miscellaneous Metals</b>				
Remove & replace debris screen w/ PVC coated 5/8" mesh	982	SQFT	10.20	10,020
<b>Subtotal: Miscellaneous Metals</b>				<b>\$10,020</b>
<b>TOTAL: METALS</b>				<b>\$400,020</b>
<b>07000 THERMAL &amp; MOISTURE PROTECTION</b>				
<b>07400 Roofing</b>				
Replace dome floor "roof". Provide tapered rigid insulation w/ adhered PVC roof membrane incl. flashing & counterflashing	981	SQFT	33.45	32,813
Clad dome in copper panels over a layer of rosin paper over high temperature rated self-adhered self-sealing membrane flashing on exterior grade 5/8" plywood sheathing attached to the existing glazing armature. Panels range in size from 6'x3' to 3'x3'	112	EACH	1,714.27	191,999
Recreate original lantern roof & skirt design, 19' high, 14' wide. All skyward surfaces to have solid continuous backing. Provide bronze pipe guardrail. Provide copper roof hatch & shaft for flag pole	1	EACH	67,927.74	67,928
Recreated primary & secondary ornamental copper ribs (379 LF)	120	EACH	564.28	67,713
<b>Subtotal: Roofing</b>				<b>\$360,453</b>
<b>07500 Roofing Specialties</b>				
Reinstall salvaged roof pavers	1,355	SQFT	8.17	11,068
Reclad flagpole w/ new rigging to extend through roof hatch in lantern roof	1	EACH	3,914.16	3,914
<b>Subtotal: Roofing Specialties</b>				<b>\$14,983</b>
<b>07600 Metal Panel Systems</b>				
Copper cladding over backing, blocking, armatures, moldings & raised panels	2,638	SQFT	165.43	436,395

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Recreate column capitols, columns & bases from existing examples, 2'-0"x21'-0"x1'-10"	16	EACH	28,176.80	450,829
Recreate entablature w/ dentil course & ornament cornice from existing examples	737	SQFT	188.51	138,933
Recreate medallions from historic photos & drawings, 9'-8"x8'-3"	8	EACH	15,499.81	123,998
Recreate sculptural brackets from historic photos & drawings w/ stamped acanthus leaf ornament recreated from existing examples, 1'-8"x4'-6"x1'-2"	16	EACH	3,842.80	61,485
Recreate spheres on plinths w/ 3 scuptural brackets from historic photos & drawings, 4'-6"x5'-0"	4	EACH	24,268.26	97,073
Recreate stamped ornamental swags from historic photos & drawings, 9'-7"x4'-9"	12	EACH	8,685.61	104,227
Recreate stamped ornamental swags from historic photos & drawings, 12'-0"x5'-0"	8	EACH	12,128.41	97,027
			<b>Subtotal: Metal Panel Systems</b>	<b>\$1,509,968</b>
<b>07900 Miscellaneous Thermal &amp; Moisture Protection</b>				
Copper louver w/ bird screen, 6'-6"x2'-4"	4	EACH	8,471.41	33,886
			<b>Subtotal: Miscellaneous Thermal &amp; Moisture Protection</b>	<b>\$33,886</b>
<b>TOTAL: THERMAL &amp; MOISTURE PROTECTION</b>				<b>\$1,919,289</b>
<b>08000 OPENINGS</b>				
<b>08100 Windows</b>				
Copper clad (Kalamein) windows to match profiles of sunburst window frame & sash, fixed single glazed laminated glass, 6'-6"x10'-9"	4	EACH	58,050.64	232,203
Copper clad (Kalamein) windows to match profiles of sunburst window frame & sash, fixed single glazed laminated glass, 5'-6"x10'-9"	8	EACH	51,050.64	408,405
Copper clad (Kalamein) windows to match profiles of sunburst window frame & sash, fixed single glazed laminated glass, half round, 5'-6"x2'-6"	8	EACH	13,033.76	104,270
Copper clad (Kalamein) windows to match profiles of sunburst window frame & sash, fixed single glazed laminated glass, half round, 6'-4"x3'-2"	4	EACH	17,033.76	68,135
			<b>Subtotal: Windows</b>	<b>\$813,013</b>
<b>08300 Exterior Doors, Frames, &amp; Hardware</b>				
Copper clad access door, (2)1'-6"x5'-0"	4	EACH	12,033.76	48,135
			<b>Subtotal: Exterior Doors, Frames, &amp; Hardware</b>	<b>\$48,135</b>
<b>08800 Louvers &amp; Vents</b>				
Repair operable fins of interior barometric dampers, 6'-6"x2'-4"	4	EACH	1,121.41	4,486
			<b>Subtotal: Louvers &amp; Vents</b>	<b>\$4,486</b>
<b>TOTAL: OPENINGS</b>				<b>\$865,633</b>
<b>26000 ELECTRICAL</b>				
<b>26500 Lighting</b>				
Provide clerestory level work lights: (4) outdoor rated LED fixtures hanging from dome floor deck	4	EACH	3,309.84	13,239
Provide dome level work lights: (4) outdoor rated up/down LED work lights to be placed on the trusses	4	EACH	2,806.56	11,226
Courthouse rooftop LED narrow beam lights to illuminate the flag	2	EACH	2,756.56	5,513
Weatherproof duplex outlets and associated branch circuits	6	EACH	850.00	5,100





**Manitowoc County Courthouse  
County Dome & Facility Improvements  
Study**

Conceptual Estimate  
05/25/2022  
DRAFT

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
			<b>Subtotal: Lighting</b>	<b>\$35,079</b>
<b>TOTAL: ELECTRICAL</b>				<b>\$35,079</b>
<b>TOTAL: TOWER RESTOTATION</b>				<b>\$5,613,421</b>

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
<b>ATRIUM INTERIOR DOME RESTORATION</b>				
<b>01000 GENERAL REQUIREMENTS</b>				
<b>01600 Construction Access</b>				
Tubular scaffolds - interior	8,000	SQFT	19.23	153,864
<b>Subtotal: Construction Access</b>				<b>\$153,864</b>
<b>TOTAL: GENERAL REQUIREMENTS</b>				<b>\$153,864</b>
<b>02000 EXISTING CONDITIONS</b>				
<b>02100 Selective Demolition</b>				
Remove existing stainless steel panels & lites at dome	746	SQFT	23.44	17,485
Remove insulation on dome drum	930	SQFT	4.18	3,886
<b>Subtotal: Selective Demolition</b>				<b>\$21,371</b>
<b>02800 Temporary Construction</b>				
Temporary partitions	7,700	SQFT	14.47	111,434
Temporary door, frame & hardware	3	EACH	1,694.61	5,084
Remove temporary partitions	7,700	SQFT	4.59	35,375
Remove temporary door, frame & hardware	3	EACH	203.06	609
<b>Subtotal: Temporary Construction</b>				<b>\$152,502</b>
<b>TOTAL: EXISTING CONDITIONS</b>				<b>\$173,873</b>
<b>04000 MASONRY</b>				
<b>04900 Miscellaneous Masonry</b>				
Repair or replace any cracked or damaged structural clay tile	488	SQFT	33.98	16,582
<b>Subtotal: Miscellaneous Masonry</b>				<b>\$16,582</b>
<b>TOTAL: MASONRY</b>				<b>\$16,582</b>
<b>05000 METALS</b>				
<b>05100 Structural Steel</b>				
Provide 24" wide metal catwalk w/ open grate & guardrails hung from steel structure above, 10'-0". Modify existing abandoned original steel ladder to connect to catwalk	1	EACH	19,155.24	19,155
<b>Subtotal: Structural Steel</b>				<b>\$19,155</b>
<b>05500 Metal Restoration &amp; Cleaning</b>				
Blast, prime & paint existing steel ladder to catwalk	1	EACH	8,027.96	8,028
Blast existing dome frame/structure. Prime & paint w/ high performance coating	535	LNFT	68.59	36,697
<b>Subtotal: Metal Restoration &amp; Cleaning</b>				<b>\$44,724</b>
<b>TOTAL: METALS</b>				<b>\$63,880</b>
<b>06000 WOODS, PLASTICS &amp; COMPOSITES</b>				
<b>06900 Miscellaneous Woods, Plastics &amp; Composites</b>				
Remove, document & salvage wood trim from underside of dome (535 LF)	170	EACH	262.98	44,707
Remount wood trim repairing one broken piece (535 LF)	170	EACH	624.89	106,232
<b>Subtotal: Miscellaneous Woods, Plastics &amp; Composites</b>				<b>\$150,939</b>
<b>TOTAL: WOODS, PLASTICS &amp; COMPOSITES</b>				<b>\$150,939</b>

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
<b>08000 OPENINGS</b>				
<b>08700 Special Glazing Systems</b>				
Provide 1" thk laminated insulated glass frosted safety glass panels, 1'-0"x4'-0"	24	EACH	1,223.51	29,364
Provide 1" thk laminated insulated glass frosted safety glass panels, 2'-4"x4'-7"	24	EACH	2,684.68	64,432
Provide 1" thk laminated insulated glass frosted safety glass panels, 3'-5"x4'-3"	24	EACH	3,420.68	82,096
<b>Subtotal: Special Glazing Systems</b>				<b>\$175,893</b>
<b>TOTAL: OPENINGS</b>				<b>\$175,893</b>
<b>10000 SPECIALTIES</b>				
<b>10900 Miscellaneous Specialties</b>				
Remove, salvage & reinstall chandelier	1	EACH	8,835.36	8,835
<b>Subtotal: Miscellaneous Specialties</b>				<b>\$8,835</b>
<b>TOTAL: SPECIALTIES</b>				<b>\$8,835</b>
<b>14000 CONVEYING EQUIPMENT</b>				
<b>14900 Special Conveying Equipment</b>				
Repalce chandelier hoist system w/ electric remote controlled 1000 lbs hoist w/ cable drum & electric cable coiling drum system	1	EACH	13,806.48	13,806
<b>Subtotal: Special Conveying Equipment</b>				<b>\$13,806</b>
<b>TOTAL: CONVEYING EQUIPMENT</b>				<b>\$13,806</b>
<b>23000 HEATING VENTILATION &amp; AIR CONDITIONING</b>				
<b>23100 Selective Demolition</b>				
Disconnect, demo, and remove AHU HW coil	1	EACH	8,263.04	8,263
<b>Subtotal: Selective Demolition</b>				<b>\$8,263</b>
<b>23200 Ventilation &amp; Exhaust</b>				
Replace existing AHU fan(s)/motor w/fan array system	1	EACH	65,394.56	65,395
Replace existing AHU HW coil	1	EACH	20,263.04	20,263
HW coil connections, AHU - valves, fittings, specialties, and pipe insulation	1	EACH	17,261.76	17,262
Route new large diameter spiral duct at Atrium area	120	LNFT	730.00	87,600
<b>Subtotal: Ventilation &amp; Exhaust</b>				<b>\$190,519</b>
<b>23600 Temperature Controls</b>				
DDC controls - AHU's w/new fan arrays	1	EACH	30,000.00	30,000
<b>Subtotal: Temperature Controls</b>				<b>\$30,000</b>
<b>23700 Testing, Balancing, &amp; Commissioning</b>				
Perform preconstruction airflow testing on built-up AHU	1	EACH	25,000.00	25,000
Perform postconstruction airflow testing on built-up AHU	1	EACH	25,000.00	25,000
<b>Subtotal: Testing, Balancing, &amp; Commissioning</b>				<b>\$50,000</b>
<b>TOTAL: HEATING VENTILATION &amp; AIR CONDITIONING</b>				<b>\$278,782</b>
<b>26000 ELECTRICAL</b>				
<b>26500 Lighting</b>				
Provide 8 wall mounted LED spot light fixtures to backlight dome	8	EACH	2,154.92	17,239
<b>Subtotal: Lighting</b>				<b>\$17,239</b>



**Manitowoc County Courthouse  
County Dome & Facility Improvements  
Study**

Conceptual Estimate  
05/25/2022  
DRAFT

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
<b>26700 Mechanical Equipment Connections &amp; Feeders</b>				
Motors connection, disconnect switches and associated feeders - Chandelier hoist system	1	EACH	2,206.56	2,207
<b>Subtotal: Mechanical Equipment Connections &amp; Feeders</b>				<b>\$2,207</b>
<b>TOTAL: ELECTRICAL</b>				<b>\$19,446</b>
<b>TOTAL: ATRIUM INTERIOR DOME RESTORATION</b>				<b>\$1,055,900</b>

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
<b>WINDOW REPLACEMENT</b>				
<b>02000 EXISTING CONDITIONS</b>				
<b>02100 Selective Demolition</b>				
Remove, salvage, reinstall existing furniture as necessary to install windows	119	EACH	918.83	109,341
Remove AL framed louver, 3'-3"x3'-9"	3	EACH	3,354.22	10,063
Remove AL framed window, 3'-4"x6'-6"	3	EACH	635.55	1,907
Remove AL framed window, 3'-6"x7'-6"	8	EACH	635.55	5,084
Remove AL framed window, 4'-4"x3'-7"	19	EACH	508.44	9,660
Remove AL framed window, 4'-4"x8'-2"	12	EACH	762.66	9,152
Remove AL framed window, 4'-4"x8'-10"	16	EACH	762.66	12,203
Remove AL framed window, 4'-8"x9'-0"	18	EACH	762.66	13,728
Remove AL framed window, 6'-0"x8'-9"	12	EACH	1,016.88	12,203
Remove AL framed window, 6'-4"x3'-8"	1	EACH	635.55	636
Remove AL framed window, 6'-8"x6'-9"	1	EACH	762.66	763
Remove AL framed window, 6'-8"x8'-4"	10	EACH	1,016.88	10,169
Remove AL framed window, 6'-8"x8'-8"	12	EACH	1,016.88	12,203
Remove AL framed window, 8'-5"x10'-6"	1	EACH	1,525.32	1,525
Remove HM door, frame & hardware	1	EACH	456.88	457
			<b>Subtotal: Selective Demolition</b>	<b>\$209,092</b>
<b>02800 Temporary Construction</b>				
Miscellaneous temporary protection allowance	1	LSUM	75,000.00	75,000
Temporary weather enclosures	4,700	SQFT	28.89	135,794
Remove temporary weather enclosures	4,700	SQFT	6.13	28,790
			<b>Subtotal: Temporary Construction</b>	<b>\$239,584</b>
<b>TOTAL: EXISTING CONDITIONS</b>				<b>\$448,676</b>
<b>04000 MASONRY</b>				
<b>04900 Miscellaneous Masonry</b>				
Reopen existing masonry infilled opening. Prepare for new window (174 SF)	3	EACH	5,341.08	16,023
			<b>Subtotal: Miscellaneous Masonry</b>	<b>\$16,023</b>
<b>TOTAL: MASONRY</b>				<b>\$16,023</b>
<b>08000 OPENINGS</b>				
<b>08100 Windows</b>				
AL framed simulated double hung window, 3'-4"x6'-6"	3	EACH	8,371.10	25,113
AL framed double hung window, 3'-6"x7'-6"	8	EACH	10,471.10	83,769
AL framed simulated double hung window, 4'-4"x3'-7"	19	EACH	6,116.88	116,221
AL framed simulated double hung window, 4'-4"x8'-2"	12	EACH	13,125.32	157,504
AL framed simulated double hung window, 4'-4"x8'-10"	16	EACH	14,025.32	224,405
AL framed simulated double hung window, 4'-8"x9'-0"	18	EACH	15,225.32	274,056
AL framed simulated double hung window, 6'-0"x8'-9"	12	EACH	19,133.76	229,605
AL framed simulated double hung window, 6'-4"x3'-8"	1	EACH	8,771.10	8,771
AL framed simulated double hung window, 6'-8"x6'-9"	1	EACH	16,225.32	16,225
AL framed double hung window, 6'-8"x8'-8"	15	EACH	22,233.76	333,506

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
AL framed simulated double hung window, 6'-8"x8'-4"	10	EACH	20,133.76	201,338
AL framed double hung window, 8'-5"x10'-6"	1	EACH	34,050.64	34,051
Extra for insulated transom panel	75	SQFT	15.00	1,125
			<b>Subtotal: Windows</b>	<b>\$1,705,689</b>
<b>08300 Exterior Doors, Frames, &amp; Hardware</b>				
HM door, frame & hardware w/ transom panel, 4'-3"x12'-0"	1	EACH	5,562.88	5,563
			<b>Subtotal: Exterior Doors, Frames, &amp; Hardware</b>	<b>\$5,563</b>
<b>08800 Louvers &amp; Vents</b>				
AL framed louver, 3'-3"x3'-9"	3	EACH	3,608.44	10,825
			<b>Subtotal: Louvers &amp; Vents</b>	<b>\$10,825</b>
<b>TOTAL: OPENINGS</b>				<b>\$1,722,077</b>
<b>09000 FINISHES</b>				
<b>09100 Plaster &amp; Gypsum Board</b>				
Repair interior plaster wall at removed masonry opening for window	3	EACH	2,100.51	6,302
Create gyp board light well/soffit	12,215	SQFT	23.85	291,280
			<b>Subtotal: Plaster &amp; Gypsum Board</b>	<b>\$297,582</b>
<b>09400 Ceiling Finishes</b>				
Rework existing dropped ceiling to create light well soffit as necessary	98	EACH	570.95	55,953
			<b>Subtotal: Ceiling Finishes</b>	<b>\$55,953</b>
<b>09600 Paints &amp; Coatings</b>				
Prepare & paint patch plaster wall	800	SQFT	3.78	3,022
Prepare & paint gyp board light well/soffit	12,215	SQFT	3.78	46,141
			<b>Subtotal: Paints &amp; Coatings</b>	<b>\$49,163</b>
<b>TOTAL: FINISHES</b>				<b>\$402,698</b>
<b>12000 FURNISHINGS</b>				
<b>12100 Window Treatment</b>				
Roller shades, manual	4,571	SQFT	13.11	59,925
			<b>Subtotal: Window Treatment</b>	<b>\$59,925</b>
<b>TOTAL: FURNISHINGS</b>				<b>\$59,925</b>
<b>23000 HEATING VENTILATION &amp; AIR CONDITIONING</b>				
<b>23100 Selective Demolition</b>				
Disconnect and remove exhaust fan	2	EACH	1,032.88	2,066
			<b>Subtotal: Selective Demolition</b>	<b>\$2,066</b>
<b>23200 Ventilation &amp; Exhaust</b>				
Provide new exhaust fans to replace existing	2	EACH	2,689.32	5,379
Provide new exhaust ductwork to replace existing at area of window replacement	1	LSUM	6,131.52	6,132
			<b>Subtotal: Ventilation &amp; Exhaust</b>	<b>\$11,510</b>
<b>23600 Temperature Controls</b>				
DDC controls - exhaust fans	2	EACH	3,000.00	6,000
			<b>Subtotal: Temperature Controls</b>	<b>\$6,000</b>
<b>23700 Testing, Balancing, &amp; Commissioning</b>				

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Air testing and balancing	1	LSUM	5,000.00	5,000
HVAC system commissioning	1	LSUM	5,000.00	5,000
<b>Subtotal: Testing, Balancing, &amp; Commissioning</b>				<b>\$10,000</b>
<b>TOTAL: HEATING VENTILATION &amp; AIR CONDITIONING</b>				<b>\$29,576</b>
<b>26000 ELECTRICAL</b>				
<b>26500 Lighting</b>				
Relocate lay-in 2x4 light fixtures where required	1	LSUM	10,000.00	10,000
<b>Subtotal: Lighting</b>				<b>\$10,000</b>
<b>26700 Mechanical Equipment Connections &amp; Feeders</b>				
Motors connection, disconnect switches and associated feeders - exhaust fans	2	EACH	2,500.00	5,000
<b>Subtotal: Mechanical Equipment Connections &amp; Feeders</b>				<b>\$5,000</b>
<b>TOTAL: ELECTRICAL</b>				<b>\$15,000</b>
<b>TOTAL: WINDOW REPLACEMENT</b>				<b>\$2,693,975</b>

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
<b>VAV/VALVE REPLACEMENT W/ PNEUMATIC CONTROL CONVERSION</b>				
<b>02000 EXISTING CONDITIONS</b>				
<b>02800 Temporary Construction</b>				
Miscellaneous temporary protection allowance	1	LSUM	75,000.00	75,000
<b>Subtotal: Temporary Construction</b>				<b>\$75,000</b>
<b>TOTAL: EXISTING CONDITIONS</b>				<b>\$75,000</b>
<b>23000 HEATING VENTILATION &amp; AIR CONDITIONING</b>				
<b>23100 Selective Demolition</b>				
Disconnect and remove VAV terminal w/reheat coil	62	EACH	774.66	48,029
Disconnect and remove fan-powered terminal w/out reheat coil	1	EACH	774.66	775
Demo/abandon existing pneumatic/DDC controls throughout bldg	1	LSUM	80,524.80	80,525
<b>Subtotal: Selective Demolition</b>				<b>\$129,328</b>
<b>23200 Ventilation &amp; Exhaust</b>				
Fan-powered terminals w/HW reheat coil	1	EACH	2,952.88	2,953
Variable air volume terminals w/HW reheat coil	62	EACH	2,172.88	134,719
Reheat coil connections, FPB/VAV - valves, fittings, and insulation	63	EACH	2,190.90	138,027
<b>Subtotal: Ventilation &amp; Exhaust</b>				<b>\$275,698</b>
<b>23600 Temperature Controls</b>				
DDC controls - fan-powered terminals w/reheat coil	1	EACH	2,600.00	2,600
DDC controls - VAV terminals w/reheat coil	62	EACH	2,000.00	124,000
Thermostats/temperature sensors	63	EACH	450.00	28,350
Miscellaneous points & devices	1	LSUM	30,000.00	30,000
Engineer's station	1	LSUM	18,000.00	18,000
Programming, testing, and training	1	LSUM	25,000.00	25,000
<b>Subtotal: Temperature Controls</b>				<b>\$227,950</b>
<b>23700 Testing, Balancing, &amp; Commissioning</b>				
Pipe system testing and balancing	1	LSUM	20,000.00	20,000
HVAC system commissioning	1	LSUM	10,000.00	10,000
<b>Subtotal: Testing, Balancing, &amp; Commissioning</b>				<b>\$30,000</b>
<b>TOTAL: HEATING VENTILATION &amp; AIR CONDITIONING</b>				<b>\$662,977</b>
<b>26000 ELECTRICAL</b>				
<b>26700 Mechanical Equipment Connections &amp; Feeders</b>				
Motors connection, disconnect switches and associated feeders - Fan-powered terminals	1	EACH	600.00	600
<b>Subtotal: Mechanical Equipment Connections &amp; Feeders</b>				<b>\$600</b>
<b>TOTAL: ELECTRICAL</b>				<b>\$600</b>
<b>TOTAL: VAV/VALVE REPLACEMENT W/ PNEUMATIC CONTROL CONVERSION</b>				<b>\$738,577</b>



DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
<b>REPLACEMENT OF 2ND FLOOR COURTROMM INTERIOR AHU</b>				
<b>02000 EXISTING CONDITIONS</b>				
<b>02800 Temporary Construction</b>				
Miscellaneous temporary protection allowance	1	LSUM	30,000.00	30,000
<b>Subtotal: Temporary Construction</b>				<b>\$30,000</b>
<b>TOTAL: EXISTING CONDITIONS</b>				<b>\$30,000</b>
<b>23000 HEATING VENTILATION &amp; AIR CONDITIONING</b>				
<b>23100 Selective Demolition</b>				
Disconnect and remove air handling unit above courtroom	1	EACH	10,328.80	10,329
<b>Subtotal: Selective Demolition</b>				<b>\$10,329</b>
<b>23200 Ventilation &amp; Exhaust</b>				
Provide new AHU's on reinforced floor to replace existing - 10 tons	2	EACH	97,911.00	195,822
Provide new AHU's on reinforced floor to replace existing - 4 tons	2	EACH	49,911.00	99,822
Replace old AHU ductwork w/new insulated duct	1	LSUM	50,986.40	50,986
Provide sound boots at Jury Room, private offices, and open office	1	LSUM	8,000.00	8,000
<b>Subtotal: Ventilation &amp; Exhaust</b>				<b>\$354,630</b>
<b>23600 Temperature Controls</b>				
DDC controls - air handling units - courtroom space	2	EACH	30,000.00	60,000
<b>Subtotal: Temperature Controls</b>				<b>\$60,000</b>
<b>23700 Testing, Balancing, &amp; Commissioning</b>				
Pipe system testing and balancing	1	LSUM	20,000.00	20,000
HVAC system commissioning	1	LSUM	10,000.00	10,000
<b>Subtotal: Testing, Balancing, &amp; Commissioning</b>				<b>\$30,000</b>
<b>TOTAL: HEATING VENTILATION &amp; AIR CONDITIONING</b>				<b>\$454,959</b>
<b>26000 ELECTRICAL</b>				
<b>26700 Mechanical Equipment Connections &amp; Feeders</b>				
Motors connection, disconnect switches and associated feeders - AHUs	4	EACH	4,200.00	16,800
<b>Subtotal: Mechanical Equipment Connections &amp; Feeders</b>				<b>\$16,800</b>
<b>TOTAL: ELECTRICAL</b>				<b>\$16,800</b>
<b>TOTAL: REPLACEMENT OF 2ND FLOOR COURTROMM INTERIOR AHU</b>				<b>\$501,759</b>
<b>TOTAL: BASE BID</b>				<b>\$10,603,631</b>

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
<b>ALTERNATE #1: CLAD TOWER DOME IN GLASS IN LIEU OF COPPER PANELS</b>				
<b>TOWER RESTOTATION</b>				
<b>07000 THERMAL &amp; MOISTURE PROTECTION</b>				
<b>07400 Roofing</b>				
Clad dome in copper panels over a layer of rosin paper over high temperature rated self-adhered self-sealing membrane flashing on exterior grade 5/8" plywood sheathing attached to the existing glazing armature. Panels range in size from 6'x3' to 3'x3'	-112	EACH	1,714.27	-191,999
<b>Subtotal: Roofing</b>				<b>(\$191,999)</b>
<b>TOTAL: THERMAL &amp; MOISTURE PROTECTION</b>				<b>(\$191,999)</b>
<b>08000 OPENINGS</b>				
<b>08700 Special Glazing Systems</b>				
Provide laminated glass panels, exterior glazed with custom patterned & PVB interlayer. Panels range in size from 6'x3' to 3'x3'	112	EACH	3,505.85	392,655
Rewrap existing glazing armature in copper to form glazing frames	380	LNFT	333.68	126,798
<b>Subtotal: Special Glazing Systems</b>				<b>\$519,453</b>
<b>TOTAL: OPENINGS</b>				<b>\$519,453</b>
<b>26000 ELECTRICAL</b>				
<b>26500 Lighting</b>				
Dome floor mounted fixtures	8	EACH	2,206.56	17,652
Upgrade existing architectural lighting control system	1	LSUM	15,000.00	15,000
<b>Subtotal: Lighting</b>				<b>\$32,652</b>
<b>TOTAL: ELECTRICAL</b>				<b>\$32,652</b>
<b>TOTAL: TOWER RESTOTATION</b>				<b>\$360,107</b>
<b>TOTAL: ALTERNATE #1: CLAD TOWER DOME IN GLASS IN LIEU OF COPPER PANELS</b>				<b>\$360,107</b>



DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
<b>ALTERNATE #2: UPGRADE OF TOWER EXTERIOR ARCHITECTURAL LIGHTING</b>				
<b>TOWER RESTOTATION</b>				
<b>26000 ELECTRICAL</b>				
<b>26500 Lighting</b>				
Replace existing (9) Promenade level outdoor architectural light fixtures	9	EACH	3,706.56	33,359
New lighting control	1	EACH	5,000.00	5,000
		<b>Subtotal: Lighting</b>		<b>\$38,359</b>
<b>TOTAL: ELECTRICAL</b>				<b>\$38,359</b>
<b>TOTAL: TOWER RESTOTATION</b>				<b>\$38,359</b>
<b>TOTAL: ALTERNATE #2: UPGRADE OF TOWER EXTERIOR ARCHITECTURAL LIGHTING</b>				<b>\$38,359</b>





SUMMARY

06/09/22 21-02568 Manitowoc County Courthouse Dome & Facility Improvements Budget

Item Number	Description	UOM	Quantity	Unit Cost	Grand Total Cost
<b>SUBDIVISION: 0 Base Budget</b>					<b>\$20,419,242.28</b>
WORK PACKAGE: A	Tower				\$16,383,476.44
WORK PACKAGE: B	Interior Dome, Atrium Restoration				\$1,209,169.13
WORK PACKAGE: C	Courthouse Windows, Exterior Window Replace				\$1,443,237.76
WORK PACKAGE: D	HVAC				\$1,383,358.95
<b>SUBDIVISION: A Alternates</b>					<b>\$1,748,487.09</b>
WORK PACKAGE: A	Tower				\$1,573,958.36
WORK PACKAGE: B	Interior Dome, Atrium Restoration				\$174,528.73
<b>GRAND TOTAL BASE BUDGET &amp; ALTERNATES</b>					<b>\$ 22,167,729</b>

WORK BY DIVISION

WBS2: C2.5 Windows, Replacement: At 2nd & 3rd Floor, create a GWB Recessed Lightwell 2'-6" above Ceiling @ Rooms with Acoustical Ceiling, Relocate Lights	\$214,297.90
<b>DIVISIONS: 02 SITE WORK</b>	\$214,297.90
WBS2: C3.1 Windows, Removal: Remove Existing Aluminum Window System & Clean Sealants Off Stomework	\$40,001.16
<b>DIVISIONS: 04 MASONRY &amp; DEMO / REMOVALS</b>	\$40,001.16
WBS2: C1.1 Windows, Removal: Remove Abandoned Louvers & Ductwork	\$1,281.70
WBS2: C1.2 Windows, Removal: Remove Existing Aluminum Window System & Clean Sealants Off Stomework	\$17,270.58
WBS2: C2.2 Windows, Replacement: Remove Masonry Infill, F&I Paired Windows with Glazed Transoms to match adjacent openings. F&I Interior Wood Trim to match	\$1,388.19
WBS2: C2.4 Windows, Replacement: At 1st Floor Windows, create a GWB Recessed Lightwell 2'-6" above Ceiling @ Rooms with Acoustical Ceiling, Relocate Light Fixtures	\$2,371.92
WBS2: C2.5 Windows, Replacement: At 2nd & 3rd Floor, create a GWB Recessed Lightwell 2'-6" above Ceiling @ Rooms with Acoustical Ceiling, Relocate Lights	\$5,708.90
<b>DIVISIONS: 06 WOOD &amp; PLASTICS</b>	\$2,312.91
WBS2: C2.7 Windows, Replacement: Remove Masonry Infill, F&I Paired Windows with Glazed Transoms to match adjacent openings. F&I Interior Wood Trim to match	\$2,312.91
<b>DIVISIONS: 08 DOORS &amp; WINDOWS</b>	\$500,365.26
WBS2: C1.1 Windows, Replacement: F&I New Thermally Broken Aluminum Window System. Simulate Double Hung unless noted	\$482,356.38
WBS2: C2.2 Windows, Replacement: Remove Masonry Infill, F&I Paired Windows with Glazed Transoms to match adjacent openings. F&I Interior Wood Trim to match	\$18,009.00
<b>DIVISIONS: 09 FINISHES</b>	\$248,208.80
WBS2: C2.4 Windows, Replacement: At 1st Floor Windows, create a GWB Recessed Lightwell 3'-6" above Ceiling @ Rooms with Acoustical Ceiling, Relocate Light Fixtures	\$28,747.82
WBS2: C2.5 Windows, Replacement: At 2nd & 3rd Floor, create a GWB Recessed Lightwell 2'-6" above Ceiling @ Rooms with Acoustical Ceiling, Relocate Lights	\$189,566.00
<b>DIVISIONS: 12 FURNISHINGS</b>	\$59,225.00
WBS2: C2.3 Windows, Replacement: F&I Manual Roller Shades @ All Windows	\$59,225.00
<b>DIVISIONS: 15 MECHANICAL</b>	\$38,818.25
WBS2: C1.1 Windows, Removal: Remove Abandoned Louvers & Ductwork	\$0.00
WBS2: C1.2 Windows, Removal: Remove Louvers & Ductwork to Locations per AADJ Through AADJ	\$38,818.25
<b>DIVISIONS: 16 ELECTRICAL</b>	\$20,930.00
WBS2: C2.4 Windows, Replacement: At 1st Floor Windows, create a GWB Recessed Lightwell 3'-6" above Ceiling @ Rooms with Acoustical Ceiling, Relocate Light Fixtures	\$20,930.00
WBS2: C2.5 Windows, Replacement: At 2nd & 3rd Floor, create a GWB Recessed Lightwell 2'-6" above Ceiling @ Rooms with Acoustical Ceiling, Relocate Lights	\$31,395.00
<b>WORK PACKAGE D HVAC</b>	\$1,383,358.95
<b>DIVISIONS: 01 GENERAL REQUIREMENTS</b>	\$254,873.76
WBS2:	\$154,873.76
WBS2: D1.1 HVAC, Heat Plant: No Heat Plant Work, Reporting for Future Work Only	
WBS2: D2.1 HVAC, Built-Up AHU: Before replacement perform a Test & Balance to Record Existing Total Supply Air, Return Air & Outdoor Air at the AHU & at Grilles/Registers	
WBS2: D2.2 HVAC, Built-Up AHU: Inspect Fan, Motor & Drive to Determine Compatibility with Efficient VAV Systems. Assume NOT Compatible and Replace per Scope Document	
WBS2: D2.3 HVAC, Built-Up AHU: Inspect & Clean AHU Hot Water Heat Coil. Inspect Isolation, Balancing & Control Valve for proper operation. Assume Replacement is required	
WBS2: D2.4 HVAC, Built-Up AHU: Replace All VAV Boxes and Valves complete. Remove Pneumatic Control System, Replace with DDC, match converted DDC System in building	
WBS2: D2.5 HVAC, Built-Up AHU: Inspect and Clean All Ductwork, Repair and Replace as Required	
WBS2: D3.1 HVAC, Indoor AHU: Before replacement perform a Test & Balance to Record Existing Total Supply Air, Return Air & Outdoor Air at the AHU & at Grilles/Registers	
WBS2: D3.2 HVAC, Indoor AHU: Replace AHU, exceeded life. Install 2 Units. Separate Courtyard Ductwork from Office Ductwork. New Equipment, New DDC Controls Integrated BAS	
<b>DIVISIONS: 04 MASONRY &amp; DEMO / REMOVALS</b>	\$24,009.09
WBS2: D2.4 HVAC, Built-Up AHU: Replace All VAV Boxes and Valves complete. Remove Pneumatic Control System, Replace with DDC, match converted DDC System in building	\$24,009.09
<b>DIVISIONS: 09 FINISHES</b>	\$13,819.60
WBS2: D2.4 HVAC, Built-Up AHU: Replace All VAV Boxes and Valves complete. Remove Pneumatic Control System, Replace with DDC, match converted DDC System in building	\$13,819.60
<b>DIVISIONS: 15 MECHANICAL</b>	\$957,154.10
WBS2:	\$945,636.50
WBS2: D2.1 HVAC, Built-Up AHU: Before replacement perform a Test & Balance to Record Existing Total Supply Air, Return Air & Outdoor Air at the AHU & at Grilles/Registers	\$5,720.00
WBS2: D2.2 HVAC, Built-Up AHU: Inspect Fan, Motor & Drive to Determine Compatibility with Efficient VAV Systems. Assume NOT Compatible and Replace per Scope Document	
WBS2: D2.3 HVAC, Built-Up AHU: Inspect & Clean AHU Hot Water Heat Coil. Inspect Isolation, Balancing & Control Valve for proper operation. Assume Replacement is required	
WBS2: D2.4 HVAC, Built-Up AHU: Replace All VAV Boxes and Valves complete. Remove Pneumatic Control System, Replace with DDC, match converted DDC System in building	
WBS2: D2.5 HVAC, Built-Up AHU: Inspect and Clean All Ductwork, Repair and Replace as Required	
WBS2: D3.1 HVAC, Indoor AHU: Before replacement perform a Test & Balance to Record Existing Total Supply Air, Return Air & Outdoor Air at the AHU & at Grilles/Registers	
WBS2: D3.2 HVAC, Indoor AHU: Replace AHU, exceeded life. Install 2 Units. Separate Courtyard Ductwork from Office Ductwork. New Equipment, New DDC Controls Integrated BAS	
<b>DIVISIONS: 16 ELECTRICAL</b>	\$11,500.00
WBS2: D3.2 HVAC, Indoor AHU: Replace AHU, exceeded life. Install 2 Units. Separate Courtyard Ductwork from Office Ductwork. New Equipment, New DDC Controls Integrated BAS	\$11,500.00
<b>SUBDIVISION: A Alternates</b>	\$1,748,487.09
<b>WORK PACKAGE A Tower</b>	\$1,573,958.34
<b>DIVISIONS: 01 GENERAL REQUIREMENTS</b>	\$291,479.41
WBS2:	\$291,479.41
WBS2:	
WBS2: A5.3 Tower, Exterior: Dome Cladding	
WBS2: A5.5 Tower, Exterior: Tower Windows, Replace Clerestory Windows with Copper Clad Monumental Wood Core or Metal Core	
WBS2: A7.1 Tower, Exterior Lighting: ALTERNATE, Ext Architectural Lighting Upgrade, Replace 9 Promenade Level Lights with LED, & Controls	
WBS2: A8.1 Tower, Lighting Protection: ALTERNATE, F&I Lighting Protection System for Tower	
<b>DIVISIONS: 05 METALS</b>	\$96,997.33
WBS2: A5.3 Tower, Exterior: Dome Cladding	\$96,997.33
<b>DIVISIONS: 07 THERMAL &amp; MOISTURE PROT.</b>	\$99,346.62
WBS2: A5.3 Tower, Exterior: Dome Cladding	\$99,346.62
<b>DIVISIONS: 08 DOORS &amp; WINDOWS</b>	\$646,875.00
WBS2: A5.3 Tower, Exterior: Dome Cladding	\$646,875.00
WBS2: A5.5 Tower, Exterior: Tower Windows, Replace Clerestory Windows with Copper Clad Monumental Wood Core or Metal Core	\$0.00
<b>DIVISIONS: 16 ELECTRICAL</b>	\$437,840.00
WBS2: A5.3 Tower, Exterior: Dome Cladding	\$437,840.00
WBS2: A7.1 Tower, Exterior Lighting: ALTERNATE, Ext Architectural Lighting Upgrade, Replace 9 Promenade Level Lights with LED, & Controls	\$276,460.00
WBS2: A8.1 Tower, Lighting Protection: ALTERNATE, F&I Lighting Protection System for Tower	\$115,000.00
<b>WORK PACKAGE B Interior Dome, Atrium Restoration</b>	\$174,528.73
<b>DIVISIONS: 01 GENERAL REQUIREMENTS</b>	\$33,320.52
WBS2:	\$33,320.52
WBS2: B3.5 Dome, Restoration: Lighting, LED Spotlights to light Dome	\$0.00
<b>DIVISIONS: 09 FINISHES</b>	\$137,208.21
WBS2: B3.5 Dome, Restoration: Lighting, LED Spotlights to light Dome	\$137,208.21
<b>DIVISIONS: 16 ELECTRICAL</b>	\$125,000.00
WBS2: B3.5 Dome, Restoration: Lighting, LED Spotlights to light Dome	\$125,000.00
<b>GRAND TOTAL BASE BUDGET &amp; ALTERNATES</b>	\$22,167,729



06/09/22 21-0156B Manitowoc County Courthouse Dome & Facility Improvements Budget

Item Number	Description	UNIT	Quantity	Unit Cost	Grand Total Cost
<b>SUBDIVISION: 0 Base Budget</b>					<b>\$20,419,742.78</b>
0100.100	SCHEDULE: 78 WEEKS	WEEK	78.00		
<b>WORK PACKAGE: A Tower</b>					<b>\$16,383,475.44</b>
<b>DIVISIONS: 03 GENERAL REQUIREMENTS</b>					<b>\$1,606,130.45</b>
<b>WBS: 03</b>					<b>\$3,034,012.73</b>
0001.100	A TOWER	****	1.00		
0189.100	GENERAL CONDITIONS TOWER	SSSS	13,435,458.00	\$ 0.092	\$1,236,062.14
0193.193	CONTRACTOR'S BOND: Bond Each Work Breakdown	LS	1.00	\$ 108,186.250	\$108,186.25
0199.197	CONSTRUCTION CONTINGENCY 10%	SSSS	14,693,603.00	\$ 0.115	\$1,689,764.35
<b>WBS: 03</b>					
0001.100	A1 Tower, Documentation: Document Exterior of Tower, Copper Clad & Ornamentation	****	1.00		
0001.200	A2 Tower, Structural Repairs & Preparation	****	1.00		
0001.300	A3 Tower, Clearestry Access & Debris Screen	****	1.00		
0001.400	A4 Tower, Barometric Relief Dampers	****	1.00		
0001.500	A5 Tower, Restoration of Tower Exterior	****	1.00		
0001.600	A6 Tower, Tower Work Lights & Electrical Service	****	1.00		
<b>WBS: A1.1 Tower, Documentation: Document Exterior of Tower, Copper Clad &amp; Ornamentation</b>					<b>\$400,510.50</b>
0001.110	A1.1 Tower, Documentation: Document Exterior of Tower, Copper Clad & Ornamentation	****	3.00		
0001.111	A1.1 a Tower, Exterior, Copper Clad: New Copper Cladding, Elements, Decorations based on Original Examples. Include Armature, Blocking, Sheathing	****	1.00		
0001.112	A1.1 b Tower, Documentation: Collect Examples of all Existing Original Ornamentation to use as Patterns	****	1.00		
0001.113	A1.1 c Tower, Documentation: Collect Examples of Existing Modified or Simplified Replacement Ornaments for Recreation from Historical Photos	****	1.00		
0001.114	A1.1 d Tower, Documentation: Document Methods of Attachment, Types, Construction, and Profiles of Armature and Backing to Assist in Replication of Cladding & Ornamentation	****	1.00		
0001.115	A1.1 e Tower, Documentation: Document Location & Condition of Building Structure and Infill used for Attachment Points	****	1.00		
0148.100	DIV-07 DOCUMENT: EXTERIOR TOWER, COPPER CLAD & ORNAMENTS, ASSES & DOCUMENT	LS	1.00	\$ 207,000.000	\$107,000.000
0148.100	DIV-07 DOCUMENT: EXTERIOR TOWER, COPPER CLAD & ORNAMENTS Profiles, ALSO A1.2	****	1.00		
0148.100	DIV-07 DOCUMENT: EXTERIOR TOWER, COLLECT EXAMPLES OF ORIGINAL ORNAMENTS FOR USE AS PATTERNS, INCLUDED	****	1.00		
0148.100	DIV-07 DOCUMENT: EXTERIOR TOWER, COLLECT EXAMPLES OF MODIFIED ORNAMENTS OR SIMPLIFIED ORNAMENTS FOR RECREATION, INCLUDED IN A1.1	****	1.00		
0148.100	DIV-07 DOCUMENT: EXTERIOR TOWER, METHOD OF ATTACHMENT, TYPES, CONSTRUCTION, PROFILES OF ARMATURE FOR REPLICATION OF CLAD & ORNAMENTS, INCLUDED	****	1.00		
0148.100	JPC DOCUMENT: TOWER, LOCATION & CONDITION OF BLDG STRUCTURE & INFILL USED FOR ATTACHMENT POINTS	LS	1.00	\$ 193,510.500	\$193,510.500
<b>WBS: A1.2 Tower, Documentation: Document Stainless Steel Dome for Reclad with Copper or Glass</b>					<b>\$17,819.23</b>
0001.120	A1.2 Tower, Documentation: Document Stainless Steel Dome for Reclad with Copper or Glass	****	1.00		
0001.121	A1.2 a Tower, Documentation: Stainless Dome: Document Dimensions of Stainless Steel Dome Cladding	****	1.00		
0001.122	A1.2 b Tower, Documentation: Stainless Dome: Document Size and Profile of Copper Cladding on Dome Glazing Armature	****	1.00		
0001.123	A1.2 c Tower, Documentation: Stainless Dome: Document Size and Location of Glazing Armature and Armature Attachments back to Structural	****	1.00		
0148.100	DIV-07 DOCUMENT: STAINLESS DOME FOR RECLAD WITH COPPER OR GLASS, BY DIV-07, INCLUDED IN A1.2	****	1.00		
0148.100	DIV-07 DOCUMENT: EXTERIOR TOWER, DOME, DIMENSIONS OF STAINLESS DOME CLADDING, BY DIV-07, INCLUDED IN A1.2	****	1.00		
0148.100	DIV-07 DOCUMENT: EXTERIOR TOWER, DOME, SIZE & PROFILE OF COPPER CLADDING ON DOME GLAZING ARMATURE, BY DIV-07, INCLUDED IN A1.2	****	1.00		
0148.100	JPC DOCUMENT: EXTERIOR TOWER, DOME, SIZE & LOCATION OF GLAZING ARMATURE & ATTACHMENTS BACK TO STRUCTURAL	WEEK	4.00	\$ 5,704.807	\$22,819.23
<b>WBS: A1.3 Tower, Documentation: Inspect and Assess Tower Steel Structure, Bracing, Floor Trusses, Decking, Dome Glazing Armature, Ladders, Stairs</b>					<b>\$17,065.46</b>
0001.130	A1.3 Tower, Documentation: Inspect and Assess Tower Steel Structure, Bracing, Floor Trusses, Decking, Dome Glazing Armature, Ladders, Stairs	****	1.00		
0103.134	BIM ENGINEER: DOCUMENT	WEEK	2.00	\$ 2,827.922	\$5,655.84
0148.100	DOCUMENT: INSPECT & ASSESS TOWER STEEL STRUCTURE, BRACING, FLOOR TRUSSES, DECKING, DOME GLAZING ARMATURE, LADDERS, STAIRS	WEEK	2.00	\$ 5,704.807	\$11,409.61
<b>WBS: A1.4 Tower, Documentation: Clearestry Structural Assessment, Remove Structural Clay Tile next to all B Columns, to F down to reveal imbedded Column</b>					<b>\$4,581.73</b>
0001.140	A1.4 Tower, Documentation: Clearestry Structural Assessment, Remove Structural Clay Tile next to all B Columns, to F down to reveal imbedded Column	****	1.00		
0103.134	BIM ENGINEER: DOCUMENT	WEEK	1.00	\$ 2,827.922	\$2,827.92
0148.100	DOCUMENT: CLEARESTRY STRUCTURAL ASSESSMENT	WEEK	1.00	\$ 5,704.807	\$5,704.81
<b>WBS: A2.1 Structural Repair: Repair Structural Steel, Bracing, Dome Glazing Armature, Access Ladders, &amp; Stairs</b>					<b>\$117,875.00</b>
0001.210	A2.1 Structural Repair: Repair Structural Steel, Bracing, Dome Glazing Armature, Access Ladders, & Stairs	****	1.00		
105.102	LD CREBE ENGINEERING: TOWER STEEL	LS	1.00	\$ 29,785.000	\$29,785.00
105.104	CONSULTANT	LS	1.00	\$ 88,090.000	\$88,090.00
<b>WBS: A2.2 Structural Repair: Sandblast all Exposed Steel, Lead Abatement Additional Cost</b>					
0001.220	A2.2 Structural Repair: Sandblast all Exposed Steel, Lead Abatement Additional Cost	****	1.00		
<b>WBS: A2.3 Structural Repair: Paint all Exposed Steel Structure, Bracing, Floor Trusses, Decking, Dome Glass Armature, Ladders, Stairs</b>					
0001.230	A2.3 Structural Repair: Paint all Exposed Steel Structure, Bracing, Floor Trusses, Decking, Dome Glass Armature, Ladders, Stairs	****	1.00		
<b>WBS: A2.4 Structural Repair: Inspect Exposed Structural Clay Tile, Report Cracked, Deteriorated Joints, with Lime Mortar, Tooth in Clay Tile at Removal for Steel Inspection</b>					<b>\$5,704.81</b>
0001.240	A2.4 Structural Repair: Inspect Exposed Structural Clay Tile, Report Cracked, Deteriorated Joints, with Lime Mortar, Tooth in Clay Tile at Removal for Steel Inspection	****	1.00		
0148.100	DOCUMENT: INSPECT STRUCTURAL CLAY TILE	WEEK	1.00	\$ 5,704.807	\$5,704.81
<b>WBS: A3.1 Clearestry: Remove Wire Mesh Debris Screen to facilitate painting structural steel</b>					
0001.310	A3.1 Clearestry: Remove Wire Mesh Debris Screen to facilitate painting structural steel	****	1.00		
<b>WBS: A3.2 Clearestry: Furnish &amp; Install New PVC Coated Steel Mesh 5/8" as Debris Screen</b>					
0001.320	A3.2 Clearestry: Furnish & Install New PVC Coated Steel Mesh 5/8" as Debris Screen	****	1.00		
<b>WBS: A3.3 Clearestry: Fabricate Steel Catwalks with Rails, Perimeter Walls &amp; Down Center of Tower Sheet A205</b>					
0001.330	A3.3 Clearestry: Fabricate Steel Catwalks with Rails, Perimeter Walls & Down Center of Tower Sheet A205	****	1.00		
<b>WBS: A4.1 Barometric Dampers: Repair Operable Flaps of 4 Barometric Dampers</b>					
0001.410	A4.1 Barometric Dampers: Repair Operable Flaps of 4 Barometric Dampers	****	1.00		
<b>WBS: A5.1 Tower, Exterior: Copper Clad Clearestry, Dome Base, &amp; Lantern</b>					
0001.510	A5.1 Tower, Exterior: Copper Clad Clearestry, Dome Base, & Lantern	****	1.00		
0001.511	A5.1 a Tower, Exterior, Copper Clad: New Copper Cladding, Elements, Decorations based on Original Examples. Include Armature, Blocking, Sheathing	****	1.00		
0001.512	A5.1 b Tower, Exterior, Copper Clad: Dome Lantern, Start, Roof to be restored to original design, Bronze Guard Rail, Roof Hatch & Shaft for Flag Access	****	1.00		
0001.513	A5.1 c Tower, Exterior, Copper Clad: New Copper Louvers 72x30 with Insect Screen and Bird Screen, at Exterior Side Clearestry 14 Barometric Relief Dampers	****	1.00		
<b>WBS: A5.2 Tower, Exterior: Flagpole, Reclad with Copper</b>					
0001.520	A5.2 Tower, Exterior: Flagpole, Reclad with Copper	****	1.00		
0001.521	A5.2 a Tower, Exterior, Flag Pole: Reclad Flagpole with Copper, Replace Copper Sphere at top of Pole	****	1.00		
0001.522	A5.2 b Tower, Exterior, Flag Pole: New Copper Clad Fixed Flagpole Truck if Existing Cannot be Repaired	****	1.00		
0001.523	A5.2 c Tower, Exterior, Flag Pole: Remove and Install New Rigging System: Copper Clad Boom/Stand-off at base of Dome with 2 Halfard Clasts	****	3.00		
0001.524	A5.2 d Tower, Exterior, Flag Pole: #12 LED lights at Courthouse Rooftop to Illuminate Flag	****	1.00		
<b>WBS: A5.3 Tower, Exterior: Dome Cladding</b>					
0001.530	A5.3 Tower, Exterior: Dome Cladding	****	1.00		
0001.531	A5.3 a Tower, Exterior, Dome Cladding: Copper Clad Dome, Panels over a layer of Robin Paper, High Temp Self-Seal Membrane Flashing on Treated 5/8" Plywood Sheathing	****	1.00		
<b>WBS: A5.4 Tower, Exterior: Dome Floor, Remove Roofing &amp; Flashing</b>					
0001.540	A5.4 Tower, Exterior: Dome Floor, Remove Roofing & Flashing	****	1.00		
0001.541	A5.4 a Tower, Exterior, Dome Floor: Remove Roofing & Flashing	****	1.00		
0001.542	A5.4 b Tower, Exterior, Dome Floor: F&I New Adhered Membrane Roof over Mineral Wool Insulation, Tapered	****	1.00		
0001.543	A5.4 c Tower, Exterior, Dome Floor: Flash Roofing into Structural Penetrations, Roof Hatch, Steel Ladder, Base of Dome	****	1.00		
<b>WBS: A5.5 Tower, Exterior: Tower Windows, Replace Clearestry Windows with Copper Clad Monumental Wood Core or Metal Core</b>					
0001.550	A5.5 Tower, Exterior: Tower Windows, Replace Clearestry Windows with Copper Clad Monumental Wood Core or Metal Core	****	1.00		
0001.551	A5.5 a Tower, Exterior, Tower Windows: Remove and Install New Clearestry Windows, Custom Copper Clad Monumental Wood Core, or Metal Core, Match Existing	****	1.00		
<b>WBS: A6.1 Tower, Electrical: Electrical Service, Weatherproof Duplex Outlets, at Star, West Doors, Top of Star in Dome, below Roof Hatch</b>					
0001.610	A6.1 Tower, Electrical: Electrical Service, Weatherproof Duplex Outlets, at Star, West Doors, Top of Star in Dome, below Roof Hatch	****	1.00		
<b>WBS: A6.2 Tower, Electrical: Work Lights, Clearestry Level &amp; Dome Level</b>					
0001.620	A6.2 Tower, Electrical: Work Lights, Clearestry Level & Dome Level	****	1.00		
<b>DIVISIONS: 02 SITEWORK</b>					<b>\$1,947,733.15</b>
<b>WBS: A2.1 Structural Repair: Repair Structural Steel, Bracing, Dome Glazing Armature, Access Ladders, &amp; Stairs</b>					<b>\$1,947,733.15</b>
0209.910	SCAFFOLD: TOWER EXTERIOR: ERECT & REMOVAL	LS	1.00	\$ 433,759.300	\$433,759.30
0209.912	SCAFFOLD: TOWER EXTERIOR: RENTAL	WEEK	78.00	\$ 5,313.000	\$414,414.00
0209.913	SCAFFOLD: TOWER INTERIOR: ERECT & REMOVAL	LS	1.00	\$ 345,995.700	\$345,995.70
0209.914	SCAFFOLD: TOWER INTERIOR: RENTAL	WEEK	78.00	\$ 3,338.450	\$260,399.10
0209.920	SHORING PROMENADE DECK: ERECT & REMOVAL	LS	1.00	\$ 103,065.300	\$103,065.30
0209.930	SHORING PROMENADE DECK: RENTAL	WEEK	78.00	\$ 3,109.000	\$242,548.80
0209.940	PEDESTRIAN CANOPY: PERIMETER OF COURTHOUSE: ERECT & REMOVE	LS	1.00	\$ 48,409.250	\$48,409.25
0209.942	PEDESTRIAN CANOPY: PERIMETER OF COURTHOUSE: RENTAL	WEEK	78.00	\$ 1,335.150	\$104,141.70
<b>DIVISIONS: 04 MASONRY &amp; DEMO / REMOVALS</b>					<b>\$100,748.07</b>
<b>WBS: A1.6 Tower, Documentation: Clearestry Structural Assessment, Remove Structural Clay Tile next to all B Columns, to F down to reveal imbedded Column</b>					<b>\$5,731.67</b>
0490.013	REMOVE CLAY TILE VENEER: NEXT TO B COLUMNS: NEXT TO B COLUMNS TO REVEAL IMBEDDED STEEL COLUMN	SOFT	192.00	\$ 25,939	\$4,980.76
0490.045	SAWCUT CLAY TILE VENEER	LIFT	176.00	\$ 4,269	\$751.43
<b>WBS: A2.1 Structural Repair: Repair Structural Steel, Bracing, Dome Glazing Armature, Access Ladders, &amp; Stairs</b>					<b>\$3,505.87</b>
0485.053	REMOVE STEEL LADDER: REPAIR ACCESS LADDERS	LIFT	12.00	\$ 292.156	\$3,505.87
<b>WBS: A2.4 Structural Repair: Inspect Exposed Structural Clay Tile, Report Cracked, Deteriorated Joints, with Lime Mortar, Tooth in Clay Tile at Removal for Steel Inspection</b>					<b>\$46,786.46</b>
0400.001	MORTAR	CUTD	0.47	\$ 10,995	\$5,235.13
0400.020	SCAFFOLD SAFEWAY OVER CLAY TILE	SOFT	1.380.00	\$ 1,339	\$1,774.18

WORK DETAIL

0400.100	FALL JOISTS W/MORTAR	UNFT	2.24	\$	360.020		\$888.24
0401.001	CLEAR CLAY BRICK	SQFT	192.00	\$	1.502		\$288.47
0401.010	DIAMOND BLADE 15 PC/CT	EACH	216.96	\$	0.060		\$13.01
0405.303	3x5x12 CLAY BRICK STRITCHER 2.25 PCS/SQFT @ #1.4	EACH	462.00	\$	31.517		\$14,560.65
0415.300	PARGE COAT ON BLOCK @ CLAY BRICK	SQFT	192.00	\$	4.443		\$853.05
0425.122	8" DUB-A-WAL-HOT DIPPED GALV	UNFT	115.20	\$	0.795		\$91.62
0425.201	POS-TIE @ MASONRY	EACH	73.00	\$	27.027		\$1,973.00
0425.222	RE STEEL @ MASONRY	CWT	1.50	\$	151.558		\$227.33
0479.000	TUCKPOINT 26-50% 77MMHR-HARD/SCAF/EMT (CRACK/D. DETERIORATE) JOINTS @ TOWER. Area 31' x 26' x 4 sides = 4.464 SQFT	UNFT	3.48	\$	13.746		\$46,021.62
<b>WBS2: AS.1 Clerestory: Remove Wire Mesh Debris Screen to facilitate painting structural steel</b>							
0483.010	REMOVE WIRE MESH DEBRIS SCREEN @ CLERESTORY	SQFT	321.00	\$	0.468	\$3,750.14	\$2,752.14
0490.145	REMOVE FLAG POLE @ TOWER FOR RECLAD	EACH	1.00	\$	3,666.699	\$4,988.78	\$3,666.70
0490.148	REMOVE FLAG POLE BRIDGING SYSTEM	EACH	1.00	\$	1,322.077		\$1,322.08
<b>WBS2: AS.4 Tower, Exterior: Dome Floor, Remove Roofing &amp; Flashing</b>							
0490.195	REMOVE MEMBRANE ROOFING, DOME FLOOR	****	0.00				
0490.173	REMOVE SHEET METAL FLASHING, DOME FLOOR	****	0.00				
<b>WBS2: AS.5 Tower, Exterior: Tower Windows, Replace Clerestory Windows with Copper Clad Monumental Wood Core or Metal Core</b>							
0490.400	REMOVE WOOD WINDOWS, CLERESTORY TOWER	EACH	12.00	\$	1,173.579	\$16,482.95	\$16,482.95
<b>DIVISIONS: 05 METALS</b>							
<b>WBS2: AS.1 Structural Repair: Repair Structural Steel, Bracing, Dome Slating Armature, Access Ladders, &amp; Stairs</b>							
0511.144	ERECT BEAM W/36 REPAIR STRUCTURAL STEEL	EACH	8.00	\$	5,973.780		\$47,790.24
0511.147	ERECT CHIMNEY REPAIR BRACING @ DOME	EACH	8.00	\$	5,973.780		\$47,790.24
0511.157	ERECT STRUCTURAL BEAM #12 REPAIR DOME GLASS ARMATURE	EACH	8.00	\$	5,973.780		\$47,790.24
0512.157	A2.1a ERCT STRUCT BEAM #12 LANTERN REPAIRS TO ROOF FRAMING & TOPS OF COLUMNS	EACH	8.00	\$	5,973.780		\$47,790.24
0512.184	A2.1b ERCT STRUCTURAL TRUSSES REPAIR TRUSSES @ DOME, REINFORCE OR REPLACE S UNFT OF BACK TO BACK STEEL ANGLE TOP CHORD	EACH	2.00	\$	5,973.780		\$11,947.56
0512.184	A2.1c ERCT STRUCTURAL TRUSSES REPAIR TRUSSES @ DOME, REINFORCE # OF BACK TO BACK STEEL ANGLE TOP CHORD	EACH	3.00	\$	5,973.780		\$17,921.34
0512.184	A2.1d ERCT STRUCTURAL TRUSSES REPAIR TRUSSES @ DOME, REINFORCE COLUMN TO TRUSS CONNECTION @ BASE OF DOME TRUSSES	EACH	6.00	\$	5,973.780		\$35,842.68
0512.184	STRUCTURAL STEEL MATERIAL ALLOWANCE	LS	1.00	\$	1,455.900		\$1,455.90
0551.032	INSTALL STEEL STAIRS "LABOR" REPAIR STEEL STAIRS	EACH	1.00	\$	4,075.403		\$4,075.40
0551.036	STEEL LADDER W/4" REPAIR ACCESS LADDERS	EACH	1.00	\$	3,180.151		\$3,180.15
<b>WBS2: AS.2 Clerestory: Furnish &amp; Install New PVC Coated Steel Mesh 1/8" as Debris Screen</b>							
0552.000	STEEL GRATING STEEL MESH 5/8" PVC VINYL COATED DEBRIS SCREEN F&I	SQFT	325.00	\$	548.095	\$178,130.96	\$178,130.96
<b>WBS2: AS.3 Clerestory: 1&amp;1 Galv Steel Corwalks with Rails, Perimeter Walls &amp; Down Center of Tower Shunt A205</b>							
0513.002	1-1/2" X 3/4" STEEL GRATING GALV CATWALK 160 UNFT * 2.67'	UNFT	160.00	\$	1,720.000		\$276,000.00
0513.802	RAILINGS STANDARD (3/4" X 1 1/2") GALV CATWALK	UNFT	164.00	\$	114.068		\$18,607.11
<b>WBS2: AS.1 Tower, Exterior: Copper Clad Clerestory, Dome Base, &amp; Lantern</b>							
0513.020	ADD EXPOSED RAILINGS BRONZE GUARD RAIL	UNFT	27.00	\$	39.867	\$1,078.41	\$1,078.41
<b>WBS2: AS.2 Tower, Exterior: Flagpole, Reclad with Copper</b>							
0522.650	FALL PROTECTION TIE-OFFS, WELDED	EACH	2.00	\$	3,254.500		\$6,509.00
0522.650	OSHA TESTING, CERTIFICATION FOR TIE-OFFS	EACH	1.00	\$	4,099.750		\$4,099.75
<b>WBS2: AS.3 Tower, Exterior: Dome Cladding</b>							
0579.998	ORNAMENTAL METALS F&I ORNAMENTAL RIBS VERTICAL @ CORNER MIDSPAN HISTORIC PHOTOS 38 EACH * B	UNFT	304.00	\$	172.500	\$52,440.00	\$52,440.00
<b>DIVISIONS: 06 WOOD &amp; PLASTICS</b>							
<b>WBS2: AS.1 Tower, Exterior: Copper Clad Clerestory, Dome Base, &amp; Lantern</b>							
0611.040	RED ROBIN BLDG PAPER @ DOME PANELS	SQS	16.00	\$	68.154		\$1,090.46
0612.311	2x6 WD BK ROOF TREATED Clerestory, Dome, Lantern	UNFT	3,100.00	\$	6.245		\$19,584.65
0612.303	1/4" W/4 WOOD SHITS TREATED Clerestory, Dome, Lantern	SQFT	1,600.00	\$	5.911		\$9,475.76
<b>WBS2: AS.3 Tower, Exterior: Dome Cladding</b>							
0611.040	RED ROBIN BLDG PAPER @ DOME PANELS	SQS	14.00	\$	67.612		\$1,022.68
0611.303	1/4" W/4 WOOD SHITS TREATED @ DOME CLADDING	SQFT	2,400.00	\$	8.699		\$20,877.67
<b>WBS2: AS.3 Tower, Exterior: Tower Windows, Replace Clerestory Windows with Copper Clad Monumental Wood Core or Metal Core</b>							
0612.303	2x6 WD BK @ WINDOWS TREATED TOWER	UNFT	530.00	\$	13.651	\$7,234.77	\$7,234.77
<b>DIVISIONS: 07 THERMAL &amp; MOISTURE PROT.</b>							
<b>WBS2: AS.1 Tower, Exterior: Copper Clad Clerestory, Dome Base, &amp; Lantern</b>							
0762.020	COPPER CLADDING ELEMENTS, DECORATIONS PER ORIGINALS	****	0.00			\$6,817,877.99	
0762.020	COPPER CLADDING ARMATURE	****	0.00				
0762.020	COPPER CLADDING DOME LANTERN	****	0.00				
0762.021	COPPER CLADDING SHIRT	****	0.00				
0762.022	COPPER CLADDING ROOF	****	0.00				
0763.999	COPPER CLAD @ CLERESTORY, DOME BASE, LANTERN, FLAGPOLE, & LOUVERS INCLUDES AS.1.A, AS.1.B & AS.1.C	SQFT	2,400.00	\$	2,755.208		\$6,612,500.00
0783.000	ROOF HATCH	EACH	1.00	\$	2,581.158		\$2,581.16
0783.901	LADDER FOR ROOF HATCH @ FLAG ACCESS	EACH	1.00	\$	2,796.829		\$2,796.83
<b>WBS2: AS.3 Tower, Exterior: Dome Cladding</b>							
0762.020	COPPER CLADDING DOME PANELS 6'X3 TO 3'X3	****	2,400.00			\$805,000.00	
0763.001	MEMBRANE FLASHING, HIGH TEMP, SELF SEAL, DOME CLADDING	****	2,400.00				
0763.999	MAIN DOME COPPER CLADDING	SQFT	2,400.00	\$	335.417		\$805,000.00
<b>WBS2: AS.4 Tower, Exterior: Dome Floor, Remove Roofing &amp; Flashing</b>							
0759.998	DOME INTERIOR MEMBRANE ROOF, ADHESIVED, W/MINERAL WOOL INSULATION, TAPERED	LS	1.00	\$	92,000.000		\$92,000.00
0779.997	METAL ROOF FLASHING @ STRUCTURAL PENETRATIONS, ROOF HATCH, STEEL LADDER, @ DOME BASE	****	1.00				
<b>DIVISIONS: 08 DOORS &amp; WINDOWS</b>							
<b>WBS2: AS.3 Tower, Exterior: Tower Windows, Replace Clerestory Windows with Copper Clad Monumental Wood Core or Metal Core</b>							
0849.989	ACCESS DOORS & FRAME WEATHERSTRIP @ TOWER, 2 EA	EACH	2.00	\$	2,002.699		\$4,005.40
0869.800	WOOD WINDOWS, NEW CLERESTORY TOWER COPPER WOOD CORE LAMINATE GLASS	EACH	12.00	\$	3,513.137		\$42,157.65
0869.800	WOOD WINDOW SUPPLIER	EACH	12.00	\$	142,311.500		\$1,707,739.00
<b>DIVISIONS: 09 FINISHES</b>							
<b>WBS2: AS.2 Structural Repair: Sandblast Exposed Steel, Lead Abatement Additional Cost</b>							
0994.820	LEAD ABATEMENT ADDITIONAL COST IF PAINT IS LEAD	SQS	0.00			\$172,500.00	
0994.990	TOWER SANDBLAST EXPOSED STEEL FRAMEWORK ALLOWANCE	LS	1.00	\$	172,500.000		\$172,500.00
<b>WBS2: AS.3 Structural Repair: Paint all Exposed Steel Structure, Bracing, Floor Trusses, Decking, Dome Glass Armature, Ladders, Stairs</b>							
0994.808	PAINT EXPOSED STEEL STRUCTURE DECKING	SQFT	0.00			\$172,500.00	
0994.816	PAINTING PRIME & PAINT TOWER STEEL, BRACING, FLOOR TRUSS, DOME ARMATURE	UNFT	0.00				
0994.817	PAINTING PRIME & PAINT TOWER LADDERS	UNFT	0.00				
0994.817	PAINTING PRIME & PAINT TOWER STAIRS	UNFT	0.00				
0994.990	PAINT TOWER STRUCTURE ALLOWANCE	LS	1.00	\$	172,500.000		\$172,500.00
<b>WBS2: AS.3 Tower, Exterior: Tower Windows, Replace Clerestory Windows with Copper Clad Monumental Wood Core or Metal Core</b>							
0994.812	PAINT NEW WOOD WINDOWS @ CLERESTORY TOWER	EACH	12.00	\$	1,150.000	\$13,800.00	\$13,800.00
<b>DIVISIONS: 10 SPECIALTIES</b>							
<b>WBS2: AS.2 Tower, Exterior: Flagpole, Reclad with Copper</b>							
1035.100	FLAGPOLE COPPER BRICK/POLE EY, REW IF EXISTING CAN'T REPAIR	EACH	1.00	\$	688.171		\$688.17
1035.100	FLAGPOLE INSTALL NEW WINDING SYSTEM, COPPER CLAD BEGIM/STAND-OFF, WITH 2 GLAZES	EACH	1.00	\$	4,682.152		\$4,682.15
1039.800	FLAGPOLE 25" INSTALL POLE AFTER RECLAD	EACH	1.00	\$	4,061.783		\$4,061.78
1039.802	FLAGPOLE 25" RECLAD FLAGPOLE IN COPPER, REPLACE COPPER SPHERE @ TOP OF POLE	EACH	1.00	\$	31,050.000		\$31,050.00
<b>DIVISIONS: 13 MECHANICAL</b>							
<b>WBS2: AS.1 Barometric Damper: Repair Operable Fins of 4 Barometric Damper</b>							
1599.100	HVAC REPAIR OPERABLE FINS @ 4 BAROMETRIC DAMPERS	UNFT	4.00	\$	18,067.938		\$72,271.75
<b>WBS2: AS.1 Tower, Exterior: Copper Clad Clerestory, Dome Base, &amp; Lantern</b>							
1599.200	HVAC NEW COPPER LOUVERS 72X30, INSULATED SCREEN BIRD SCREEN @ 4 BAROMETRIC DAMPERS	UNFT	4.00	\$	5,462.500		\$21,850.00
<b>DIVISIONS: 16 ELECTRICAL</b>							
<b>WBS2:</b>							
1699.400	ELECTRICAL TEMP POWER @ TOWER	UNFT	1.00	\$	23,000.000		\$23,000.00
<b>WBS2: AS.2 Tower, Exterior: Flagpole, Reclad with Copper</b>							
1699.100	ELECTRICAL 2 LED LIGHTS FOR FLAG	UNFT	2.00	\$	5,750.000		\$11,500.00
<b>WBS2: AS.1 Tower, Electrical: Electrical Service, Weatherproof Duplex Outlets, at Stair, West Door, Top of Stair in Dome, below Roof Hatch</b>							
1699.100	ELECTRICAL ELEC SERVICE, OUTLETS @ STAIR, WEST DOOR, TOP STAIR @ DOME, BELOW HATCH	UNFT	4.00	\$	2,875.000		\$11,500.00
<b>WBS2: AS.2 Tower, Electrical: Work Lights, Clerestory Level &amp; Dome Level</b>							
1699.100	ELECTRICAL TOWER WORK LIGHTS, 4 CLERESTORY & 4 DOME LEVEL	UNFT	8.00	\$	5,750.000		\$46,000.00
<b>WORK PACKAGE: B Interior Dome, Atrium Restoration</b>							
<b>DIVISIONS: 01 GENERAL REQUIREMENTS</b>							
<b>WBS2:</b>							
0002.000	@ INTERIOR DOME, ATRIUM RESTORATION	****	1.00				
0189.100	GENERAL CONDITIONS INTERIOR DOME, ATRIUM RESTO	5555	991.600	\$	0.092		\$91,127.70
0193.193	CONTRACTOR'S BOND Bond Each Work Breakdown	LS	1.00	\$	7,984.450		\$7,984.45
0199.197	CONSTRUCTION CONTINGENCY 10%	5555	1,084.456	\$	0.115		\$124,712.44
<b>WBS2:</b>							
0002.100	B1 Dome Documentation & Removal	****	1.00				
0002.200	B2 Dome Structural Repairs & Preparation	****	1.00				
0002.300	B3 Dome Restoration	****	1.00				
<b>WBS2: B1.1 Dome, Documentation: Remove Insulation on Dome &amp; Dome Drum, Remove Stainless Panels at Lites</b>							
0002.110	B1.1 Dome, Documentation Remove Insulation on Dome & Dome Drum, Remove Stainless Panels at Lites	****	1.00				





WORK DETAIL

0484 000	REMOVE LAY-IN CEILING	SQFT	1,944.00	\$	3,270.00		\$2,373.99
<b>WB52: C2.3 Windows, Replacement: At 2nd &amp; 3rd Floor, create a GWS Recessed Lightwell 2'-6" above Ceiling @ Rooms with Acoustical Ceiling, Relocate Lights</b>							\$5,758.90
0484 000	REMOVE LAY-IN CEILING	SQFT	2,520.00	\$	3,270.00		\$3,074.02
0484 000	REMOVE LAY-IN CEILING	SQFT	2,160.00	\$	3,270.00		\$2,634.88
<b>DIVISIONS: 06 WOOD &amp; PLASTICS</b>							\$2,813.81
<b>WB52: C2.3 Windows, Replacement: Remove Masonry Infill, F&amp;I Paired Windows with Glazed Transoms to match adjacent openings, F&amp;I Interior Wood Trim to match</b>							\$2,352.93
0620 186	4" OAK MOLDING STAINED @ NEW WINDOW: CMU INFILL REMOVED, 3-LING	LMF	170.00	\$	19,273.00		\$2,892.63
<b>DIVISIONS: 08 DOORS &amp; WINDOWS</b>							\$500,365.26
<b>WB52: C2.1 Windows, Replacement: F&amp;I New Thermally Broken Aluminum Window System, Simulate Double Hung unless noted</b>							\$487,356.75
0802 202	HM DOORS 3'-6" X 8'-0"	LEAF	1.00	\$	185,133.00		\$185.13
0802 207	HM FRAMES @ DOORS, INSULATED: INSTITUTIONAL FIRE ESCAPE	LEAF	1.00	\$	192,363.00		\$192.36
0802 212	FINISH HARDWARE: INSTITUTIONAL	LEAF	1.00	\$	185,133.00		\$185.13
0802 999	HM DOOR, FRAME, HARDWARE, PANES	****	14.00	\$	5,072.833		\$1,072.63
0859 997	ALUMINUM WINDOWS: NEW SINGLE THERMALLY BROKEN, SIMULATE DOUBLE HUNG	****	17.00				
0859 997	ALUMINUM WINDOWS: NEW SINGLE THERMALLY BROKEN, SIMULATE DOUBLE HUNG	****	17.00				
0859 997	ALUMINUM WINDOWS: NEW SINGLE THERMALLY BROKEN, SIMULATE DOUBLE HUNG	****	17.00				
0859 997	ALUMINUM WINDOWS: F&I PAIRED WINDOWS, GLAZED TRANSOM	****	37.00				
0859 997	ALUMINUM WINDOWS: F&I PAIRED WINDOWS, GLAZED TRANSOM	****	11.00				
0859 997	ALUMINUM WINDOWS: F&I PAIRED WINDOWS, GLAZED TRANSOM	****	12.00				
0859 997	ALUMINUM WINDOWS: F&I PAIRED WINDOWS, GLAZED TRANSOM	****	10.00				
0859 997	ALUMINUM WINDOWS: F&I PAIRED WINDOWS, GLAZED TRANSOM	****	3.00				
0859 999	ALUMINUM WINDOWS	SQFT	4,606.00	\$	103,500.00		\$476,721.00
<b>WB52: C2.3 Windows, Replacement: Remove Masonry Infill, F&amp;I Paired Windows with Glazed Transoms to match adjacent openings, F&amp;I Interior Wood Trim to match</b>							\$18,009.00
0859 997	ALUMINUM WINDOWS: F&I PAIRED WINDOWS, GLAZED TRANSOM, MATCH ADJACENT	****	3.00				
0859 999	ALUMINUM WINDOWS: F&I PAIRED WINDOWS, GLAZED TRANSOM	SQFT	174.00	\$	103,500.00		\$18,009.00
<b>DIVISIONS: 09 FINISHES</b>							\$268,308.80
<b>WB52: C2.4 Windows, Replacement: At 1st Floor Windows, create a GWS Recessed Lightwell 2'-6" above Ceiling @ Rooms with Acoustical Ceiling, Relocate Light Fixtures</b>							\$78,742.80
0429 999	GYP-SUM DRYWALL: RECESSED LIGHTWELL, 3'-6" ABOVE CEILING, 128 SQFT	SQFT	3,456.00	\$	13,800.00		\$47,692.80
0930 100	PATCH LAY-IN CEILING: RECESSED LIGHTWELL	SQFT	1,296.00	\$	8,625.00		\$11,178.00
0994 804	PAINT DRYWALL: RECESSED LIGHTWELL	SQFT	3,456.00	\$	5,750.00		\$19,872.00
<b>WB52: C2.5 Windows, Replacement: At 2nd &amp; 3rd Floor, create a GWS Recessed Lightwell 2'-6" above Ceiling @ Rooms with Acoustical Ceiling, Relocate Lights</b>							\$199,166.00
0929 999	GYP-SUM DRYWALL: RECESSED LIGHTWELL, 2'-6" ABOVE CEILING	SQFT	4,480.00	\$	13,800.00		\$61,824.00
0929 999	GYP-SUM DRYWALL: RECESSED LIGHTWELL, 2'-6" ABOVE CEILING	SQFT	3,840.00	\$	13,800.00		\$52,992.00
0950 100	PATCH LAY-IN CEILING: RECESSED LIGHTWELL	SQFT	1,680.00	\$	8,625.00		\$14,490.00
0950 100	PATCH LAY-IN CEILING: RECESSED LIGHTWELL	SQFT	1,440.00	\$	8,625.00		\$11,470.00
0994 806	PAINT DRYWALL: RECESSED LIGHTWELL	SQFT	4,480.00	\$	5,750.00		\$25,760.00
0994 806	PAINT DRYWALL: RECESSED LIGHTWELL	SQFT	3,840.00	\$	5,750.00		\$21,080.00
<b>DIVISIONS: 12 FURNISHINGS</b>							\$99,275.00
<b>WB52: C2.3 Windows, Replacement: F&amp;I Manual Roller Shades @ All Windows</b>							\$99,275.00
1234 998	MANUAL ROLLER SHADES ALL WINDOWS: F&I	LMF	124.00	\$	477,613.00		\$19,275.00
<b>DIVISIONS: 15 MECHANICAL</b>							\$38,818.25
<b>WB52: C1.1 Windows, Removal: Remove Abandoned Louvers &amp; Ductwork</b>							\$0.00
1599 100	HVAC: REMOVE ABANDONED LOUVERS & DUCTWORK, INCLUDED IN HVAC C1.2 Relocate	****	7.00				
<b>WB52: C1.2 Windows, Removal: Relocate Louvers &amp; Ductwork to Locations per A401 through A404</b>							\$38,818.25
1599 100	HVAC: REMOVE & RELOCATE LOUVERS & DUCTWORK PER A401 THRU A404	LMF	5.00	\$	7,761,650.00		\$38,818.25
<b>DIVISIONS: 16 ELECTRICAL</b>							\$13,375.00
<b>WB52: C2.4 Windows, Replacement: At 1st Floor Windows, create a GWS Recessed Lightwell 2'-6" above Ceiling @ Rooms with Acoustical Ceiling, Relocate Light Fixtures</b>							\$20,930.00
1699 999	ELECTRICAL: RELOCATE LIGHTS	LMF	26.00	\$	805,000.00		\$20,930.00
<b>WB52: C2.5 Windows, Replacement: At 2nd &amp; 3rd Floor, create a GWS Recessed Lightwell 2'-6" above Ceiling @ Rooms with Acoustical Ceiling, Relocate Lights</b>							\$31,395.00
1699 999	ELECTRICAL: RELOCATE LIGHTS	LMF	13.00	\$	805,000.00		\$10,465.00
1699 999	ELECTRICAL: RELOCATE LIGHTS	LMF	26.00	\$	805,000.00		\$20,930.00
<b>WORK PACKAGE D HVAC</b>							\$1,283,354.95
<b>DIVISIONS: 01 GENERAL REQUIREMENTS</b>							\$754,879.76
<b>WB52:</b>							\$754,879.76
0004 000	0 HVAC	****	3.00				
0004 100	01 HVAC: HEATING PLANT	****	3.00				
0004 200	02 HVAC: Built-Up Air Handling Unit, Replace VAVs, Drawing HV 1 to HV 5	****	1.00				
0004 300	03 HVAC: Courtroom Indoor Air Handling Unit, Replace 2nd Floor Courtroom Indoor AHU, Drawing H 3	****	1.00				
0189 100	GENERAL CONDITIONS: HVAC	5555	1,278,657.00	\$	0.097		\$103,836.44
0191 193	CONTRACTOR'S BOND: Bond Each Work Breakdown	15	1.00	\$	9,087,300.00		\$9,087.30
0199 197	CONSTRUCTION CONTINGENCY: 10%	5555	1,234,348.00	\$	0.131		\$161,950.02
<b>WB52: D1.1 HVAC: Heat Plant: No Heat Plant Work, Supporting for Future Work Only</b>							
0004 110	D1.1 HVAC: HEATING PLANT: NO HEAT PLANT WORK	****	1.00				
<b>WB52: D2.1 HVAC: Built-Up AHU: Before replacement perform a Test &amp; Balance to Record Existing Total Supply Air, Return Air &amp; Outdoor Air at the AHU &amp; at Grilles/Registers</b>							
0004 210	D2.1 HVAC: Built-Up AHU: Before replacement perform a Test & Balance to Record Existing Total Supply Air, Return Air & Outdoor Air at the AHU & at Grilles/Registers	****	1.00				
<b>WB52: D2.2 HVAC: Built-Up AHU: Inspect Fan, Motor &amp; Drive to Determine Compatibility with Efficient VAV Systems. Assume NOT Compatible and Replace per Scope Document</b>							
0004 210	D2.2 HVAC: Built-Up AHU: Inspect Fan, Motor & Drive to Determine Compatibility with Efficient VAV Systems. Assume NOT Compatible and Replace per Scope Document	****	1.00				
<b>WB52: D2.3 HVAC: Built-Up AHU: Inspect &amp; Clean AHU Hot Water Heat Coil. Inspect Insulation, Balancing &amp; Control Valve for proper operation. Assume Replacement is required</b>							
0004 230	D2.3 HVAC: Built-Up AHU: Inspect & Clean AHU Hot Water Heat Coil. Inspect Insulation, Balancing & Control Valve for proper operation. Assume Replacement is required	****	1.00				
<b>WB52: D2.4 HVAC: Built-Up AHU: Replace ALL VAV Boxes and Valves complete. Remove Pneumatic Control System, Replace with DDC, match converted DDC System in building</b>							
0004 240	D2.4 HVAC: Built-Up AHU: Replace ALL VAV Boxes and Valves complete. Remove Pneumatic Control System, Replace with DDC, match converted DDC System in building	****	1.00				
<b>WB52: D2.5 HVAC: Built-Up AHU: Inspect and Clean ALL Ductwork, Repair and Replace as Required.</b>							
0004 250	D2.5 HVAC: Built-Up AHU: Inspect and Clean ALL Ductwork, Repair and Replace as Required.	****	1.00				
<b>WB52: D3.1 HVAC: Indoor AHU: Before replacement perform a Test &amp; Balance to Record Existing Total Supply Air, Return Air &amp; Outdoor Air at the AHU &amp; at Grilles/Registers</b>							
0004 310	D3.1 HVAC: Indoor AHU: Before replacement perform a Test & Balance to Record Existing Total Supply Air, Return Air & Outdoor Air at the AHU & at Grilles/Registers	****	1.00				
<b>WB52: D3.2 HVAC: Indoor AHU: Replace AHU, exceeded life. Install 2 Units. Separate Courtroom Ductwork from Office Ductwork. New Equipment, New DDC Controls integrated BAS</b>							
0004 320	D3.2 HVAC: Indoor AHU: Replace AHU, exceeded life. Install 2 Units. Separate Courtroom Ductwork from Office Ductwork. New Equipment, New DDC Controls integrated BAS	****	1.00				
<b>DIVISIONS: 04 MASONRY &amp; DEMO / REMOVALS</b>							\$24,000.00
<b>WB52: D2.4 HVAC: Built-Up AHU: Replace ALL VAV Boxes and Valves complete. Remove Pneumatic Control System, Replace with DDC, match converted DDC System in building</b>							\$24,000.00
0484 000	REMOVE LAY-IN CEILING	SQFT	19,482.00	\$	1,220.00		\$14,000.00
<b>DIVISIONS: 09 FINISHES</b>							\$135,819.60
<b>WB52: D2.4 HVAC: Built-Up AHU: Replace ALL VAV Boxes and Valves complete. Remove Pneumatic Control System, Replace with DDC, match converted DDC System in building</b>							\$135,819.60
0950 100	PATCH LAY-IN CEILING: RECESSED LIGHTWELL: ALL FLOORS	SQFT	19,482.00	\$	6,900.00		\$135,819.60
<b>DIVISIONS: 15 MECHANICAL</b>							\$957,156.50
<b>WB52:</b>							\$945,656.50
1599 999	HVAC: BUILT-UP AHU, REPLACE VAVS, VALVES, & CONTROLS PER SHEETS HV 1 THRU HV 5	15	1.00	\$	665,119.75		\$665,119.75
1599 999	03 HVAC: Courtroom Indoor Air Handling Unit, Replace 2nd Floor Courtroom Indoor AHU, Drawing H 3	15	1.00	\$	280,336,750.00		\$280,516.75
<b>WB52: D2.1 HVAC: Built-Up AHU: Before replacement perform a Test &amp; Balance to Record Existing Total Supply Air, Return Air &amp; Outdoor Air at the AHU &amp; at Grilles/Registers</b>							\$5,750.00
1599 100	HVAC: TEST & BALANCE @ BUILT-UP AHU	15	1.00	\$	5,750,000.00		\$5,750.00
<b>WB52: D2.2 HVAC: Built-Up AHU: Inspect Fan, Motor &amp; Drive to Determine Compatibility with Efficient VAV Systems. Assume NOT Compatible and Replace per Scope Document</b>							
1599 100	HVAC: INSPECT FANS, MOTOR & DRIVE, REPLACE	****	1.00				
<b>WB52: D2.3 HVAC: Built-Up AHU: Inspect &amp; Clean AHU Hot Water Heat Coil. Inspect Insulation, Balancing &amp; Control Valve for proper operation. Assume Replacement is required</b>							
1599 100	HVAC: INSPECT & CLEAN AHU HOT WATER HEAT COIL, ASSUME REPLACEMENT	****	1.00				
<b>WB52: D2.4 HVAC: Built-Up AHU: Replace ALL VAV Boxes and Valves complete. Remove Pneumatic Control System, Replace with DDC, match converted DDC System in building</b>							
1599 100	HVAC: REPLACE ALL VAV BOXES AND VALVES. REMOVE PNEUMATICS, INSTALL DDC	****	16.00				
1599 100	HVAC: REPLACE ALL VAV BOXES AND VALVES. REMOVE PNEUMATICS, INSTALL DDC	****	18.00				
1599 100	HVAC: REPLACE ALL VAV BOXES AND VALVES. REMOVE PNEUMATICS, INSTALL DDC	****	15.00				
1599 100	HVAC: REPLACE ALL VAV BOXES AND VALVES. REMOVE PNEUMATICS, INSTALL DDC	****	22.00				
<b>WB52: D2.5 HVAC: Built-Up AHU: Inspect and Clean ALL Ductwork, Repair and Replace as Required.</b>							
1599 100	HVAC: INSPECT, CLEAN ALL DUCT, REPAIR, REPLACE AS REQUIRED @ BUILT-UP AHU	****	1.00				
<b>WB52: D3.1 HVAC: Indoor AHU: Before replacement perform a Test &amp; Balance to Record Existing Total Supply Air, Return Air &amp; Outdoor Air at the AHU &amp; at Grilles/Registers</b>							\$5,750.00
1599 100	HVAC: TEST & BALANCE @ COURTROOM AHU: Before Demo	15	1.00	\$	5,750,000.00		\$5,750.00
<b>WB52: D3.2 HVAC: Indoor AHU: Replace AHU, exceeded life. Install 2 Units. Separate Courtroom Ductwork from Office Ductwork. New Equipment, New DDC Controls integrated BAS</b>							\$0.00
1599 100	HVAC: REMOVE AHU & DUCTWORK @ COURTROOM	****	1.00				
1599 107	HVAC: INSTALL 2 NEW AHU & DUCTWORK, DDC CONTROLS @ COURTROOM	****	2.00				
<b>DIVISIONS: 16 ELECTRICAL</b>							\$11,500.00
<b>WB52: D3.2 HVAC: Indoor AHU: Replace AHU, exceeded life. Install 2 Units. Separate Courtroom Ductwork from Office Ductwork. New Equipment, New DDC Controls integrated BAS</b>							\$11,500.00
1699 900	ELECTRICAL: WDRX @ 2 AHU REMOVE & REPLACE ABOVE COURTROOM	LMF	2.00	\$	5,750,000.00		\$11,500.00

**SUBDIVISION A Alternates** **\$1,748,487.09**

**WORK PACKAGE: A Tower** **\$1,573,958.36**

**DIVISIONS: 01 GENERAL REQUIREMENTS**

<b>WB52:</b>							\$191,479.41
0189 100	GENERAL CONDITIONS: TOWER ALTERNATES	5555	1,290,753.00	\$	0.097		\$118,749.18
0191 193	CONTRACTOR'S BOND: Bond Each Work Breakdown	15	1.00	\$	20,394,700.00		\$10,393.70
0199 197	CONSTRUCTION CONTINGENCY: 10%	5555	1,431,622.00	\$	0.131		\$162,336.53
<b>WB52:</b>							
0001 700	A7 Tower ALTERNATE: Exterior Architectural Lighting Upgrade: Option	****	1.00				

WORK DETAIL

0001.800	AB Tower, ALTERNATE, Tower Lighting Protection System Option	****	1.00			
<b>WB12: AS.3 Tower, Exterior: Dome Cladding</b>						
0001.537	AS.3.D Tower, Exterior: Dome Cladding: ALTERNATE: Glass Clad Dome, wrap Glazing Armature in Copper to form Glazing Frames, Laminated Glass Panels, Ornament	****	1.00			
WB12: AS.3 Tower, Exterior: Tower Windows, Replace Clerestory Windows with Copper Clad Ornamental Wood Core or Metal Core						
0001.552	AS.3.D Tower, Exterior: Tower Windows: ALTERNATE: Remove & Install New Clerestory Windows, with TEMPERED GLASS, Interior Custom Pattern UV Window Film	****	1.00			
<b>WB12: A7.1 Tower, Exterior: Lighting: ALTERNATE: Ext Architectural Lighting Upgrade, Replace 9 Promenade Level Lights with LED, &amp; Controls</b>						
0001.210	A7.1 Tower, Exterior: Lighting: ALTERNATE: Ext Architectural Lighting Upgrade, Replace 9 Promenade Level Lights with LED, & Controls	****	1.00			
<b>WB12: AB.1 Tower, Lighting Protection: ALTERNATE: F&amp;I Lightning Protection System for Tower</b>						
0001.810	AB.1 Tower, Lighting Protection: ALTERNATE: F&I Lightning Protection System for Tower	****	1.00			
<b>DIVISIONS: 05 METALS</b>						
<b>WB12: AS.3 Tower, Exterior: Dome Cladding</b>						
0179.908	ORNAMENTAL METALS: F&I ORNAMENTAL RIBS, VERTICAL @ CORNER, MIDSPAN, NOSTRIL PHOTOS, GLASS CLAD, 3/8" EACH " &	INFT	304.00	\$	315,649	\$98,997.33
<b>DIVISIONS: 07 THERMAL &amp; MOISTURE PROT.</b>						
<b>WB12: AS.3 Tower, Exterior: Dome Cladding</b>						
0762.077	COPPER CLADDING: @ ARMATURE FOR GLAZING, FORM GLAZING FRAMEWORK, 3/8" X 8 PCS	SCFT	304.00	\$	370,140	\$99,146.62
<b>DIVISIONS: 08 DOORS &amp; WINDOWS</b>						
<b>WB12: AS.3 Tower, Exterior: Dome Cladding</b>						
0884.816	TOWER DOME GLASS PANELS 1" THICK LAMINATE GLASS	SCFT	2,500.00	\$	258,750	\$646,875.00
<b>WB12: AS.3 Tower, Exterior: Tower Windows, Replace Clerestory Windows with Copper Clad Ornamental Wood Core or Metal Core</b>						
0883.999	WOOD WINDOW @ TOWER WITH TEMPERED GLASS: NO BID	****	1.00			\$0.00
<b>DIVISIONS: 16 ELECTRICAL</b>						
<b>WB12: AS.3 Tower, Exterior: Dome Cladding</b>						
1699.100	ELECTRICAL: UP LIGHTING INSIDE DOME & LANTERN	INFT	8.00	\$	5,750.000	\$46,000.00
<b>WB12: A7.1 Tower, Exterior: Lighting: ALTERNATE: Ext Architectural Lighting Upgrade, Replace 9 Promenade Level Lights with LED, &amp; Controls</b>						
1699.100	ELECTRICAL: ALTERNATE: TOWER EXTERIOR REMOVE 9 PROMENADE LEVEL LIGHTS	INFT	9.00	\$	6,440.000	\$57,960.00
1699.400	ELECTRICAL: ALTERNATE: TOWER EXTERIOR INSTALL 9 PROMENADE LEVEL LED LIGHTS WITH CONTROLS	INFT	9.00	\$	11,500.000	\$103,500.00
1699.999	A7.1 Tower, Exterior: Lighting: ALTERNATE: Ext Architectural Lighting Upgrade, Replace 9 Promenade Level Lights with LED, & Controls	LS	1.00	\$	115,000.000	\$115,000.00
<b>WB12: AB.1 Tower, Lighting Protection: ALTERNATE: F&amp;I Lightning Protection System for Tower</b>						
1699.400	ELECTRICAL: F&I LIGHTNING PROTECTION @ TOWER	LS	1.00	\$	115,000.000	\$115,000.00
<b>WORK PACKAGE: B Interior Dome, Atrium Restoration</b>						
<b>DIVISIONS: 01 GENERAL REQUIREMENTS</b>						
<b>WB12:</b>						
0189.100	GENERAL CONDITIONS: INTERIOR DOME, ATRIUM RESTOR	\$\$\$\$	142,125.00	\$	0.097	\$13,167.50
0193.193	CONTRACTOR'S BOND: Bond Each Work Breakdown	LS	1.00	\$	2,152,300	\$1,152.30
0199.197	CONSTRUCTION CONTINGENCY: 10%	\$\$\$\$	156,528.00	\$	0.815	\$18,000.72
<b>WB12: B3.5 Dome, Restoration: Lighting: LED Spotlights to Light Dome</b>						
0002.352	B3.5.D Dome, Restoration, Lighting: ALTERNATE: Dome Drum Cornice Lighting Sheet AS01, Remove 72 abandoned Bare Bulb Sockets between Modifications at base of At	****	1.00			\$0.00
<b>DIVISIONS: 09 FINISHES</b>						
<b>WB12: B3.5 Dome, Restoration: Lighting: LED Spotlights to Light Dome</b>						
0926.100	PATCH PLASTER CEILING: ELECTRICAL PENETRATIONS: 72 LOCATIONS	SCFT	288.00	\$	80,673	\$73,233.81
0928.806	PAINT CEILINGS: ELECTRICAL PENETRATIONS	SCFT	288.00	\$	13,800	\$13,974.40
<b>DIVISIONS: 16 ELECTRICAL</b>						
<b>WB12: B3.5 Dome, Restoration: Lighting: LED Spotlights to Light Dome</b>						
1699.100	ELECTRICAL: REMOVE 72 ABANDONED BARE BULB SOCKET @ ATRIUM DOME DRUM CORNICE	****	72.00			\$115,000.00
1699.912	ELECTRICAL: F&I FIBEROPTIC REMOTE LED IN ATTIC: ALLOWANCE	LS	1.00	\$	115,000.000	\$115,000.00
<b>GRAND TOTAL BASE BUDGET &amp; ALTERNATES \$ 22,167,729</b>						

