CAPITOL COMPLEX MASTER PLAN

FINDINGS & RECOMMENDATIONS (F & R) NEEDS ASSESSMENT

CENTENNIAL BUILDING, 1313 SHERMAN STREET (DENVER)

NOVEMBER 2014

RNL

FINDINGS & RECOMMENDATIONS (F&R) NEEDS ASSESSMENT

CENTENNIAL BUILDING
1313 SHERMAN STREET (DENVER)

November 2014

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EXECUTIVE SUMMARY

The purpose of this report is to provide a Findings & Recommendations (F&R) Needs Assessment of the Centennial Building at 1313 Sherman Street in Denver, Colorado. The report includes a description and evaluation of the existing conditions, recommendations, and cost estimates for the recommended work from the following focus areas: architecture (RNL), structural (Martin/Martin Consulting Engineers), civil (Martin/Martin Consulting Engineers), mechanical/electrical/plumbing (RMH Group), voice and data (Shen Milsom Wilke), security (Shen Milsom Wilke), and cost estimating (CBRE, Inc.). The project team, led by RNL, reviewed existing building documentation, drawings, and audit reports provided by the Owner, and conducted a site visit to identify and document the observable existing conditions of the building and its code and life safety issues.

In general the building is in poor condition. A poor condition rating refers to the fact that the Centennial Building is in urgent need of repairs to address life safety and loss of use/reliability issues.

Although all recommendations presented in this report should be considered for implementation, the following are the top five priorities due to their impact on life safety (LS), loss of use/reliability (LOU), finishes (F), and overall energy efficiency:

1. Total gut and renovation back to core shell, including, but not limited to, replacing the roof, replacing the windows, replacing the aged fire alarm system and HVAC systems, adding stair pressurization for life safety, installing energy saving lighting, adding insulation to the exterior walls, and providing a more efficient layout. These recommendations encompass life safety, loss of use/reliability, finishes, and overall energy efficiency issues.

   High Level Cost Estimate: $34,212,015

Note: If a total gut and renovation of the building is not selected, then the following should be considered:

2. Replace fire alarm. This recommendation encompasses life safety issues and is due to fire protection code issues and the age of the system.

   High Level Cost Estimate: $291,541

3. Replace all HVAC, add stair pressurization. This recommendation encompasses life safety issues and overall energy efficiency issues and is due to the age of the HVAC systems and to fire protection code issues.

   High Level Cost Estimate: $9,839,947

4. Replace roof. This recommendation encompasses loss of use/ reliability issues and is due to the age of the roof.

   High Level Cost Estimate: $301,539

5. Replace all plumbing piping. This recommendation encompasses life safety and loss of use/reliability issues and is per the State's 5 year maintenance plan.

   High Level Cost Estimate: $2,722,582

If all recommendations in this report are implemented as a single project, including the top 5 priorities, the high level cost estimate is:

$34,212,015

If all recommendations in this report are implemented system by system as multiple projects, including the top 5 priorities (systems), the high level cost estimate is:

$34,482,015

1.0 OVERVIEW

1.0-A ARCHITECTURE OVERVIEW

The Centennial Building was designed by Atchison, Kloverstrom & Atchison Architects and constructed by Titan Construction Company in the 1970's. The building was dedicated on October 27, 1976 during the Centennial Year of the State of Colorado and is located in Denver's Capitol Hill Neighborhood on the northwest corner of Sherman Street and 13th Avenue. The building currently serves as government office space for the State of Colorado and is home to the Colorado State Archives which occupy the three lower levels. The Centennial Building, a steel beam, metal deck, and concrete frame construction, is a ten-story high-rise building and grosses 207,091 square feet of space.

The architectural assessment of the Centennial Building at 1313 Sherman Street included reviews of the existing building documentation, drawings, and audit reports provided by the Owner, and a site visit to survey and document the existing conditions of the building and its code and life safety issues. During the site survey on August 27, 2013, building maintenance personnel provided building history and information on the layout, finishes, maintenance routines, systems, and the dates of repairs and upgrades. In general, the building is in poor condition, although there are issues related to interior and exterior finish materials, building systems, code compliance, accessibility, asbestos, and other items that require attention in the near term. The main concerns are related to the overall deterioration and condition of the interior and exterior building finishes and systems, including, but not limited to, the roof and windows. Another concern is the age and condition of the automatic sprinkler system throughout the building. These concerns encompass life safety, loss of use/reliability, finishes, and overall energy efficiency issues. These findings, along with recommendations for repairs, are detailed in the body of this report.

1.0-B STRUCTURAL OVERVIEW

The Centennial building was constructed in 1976. The structural framing consists of concrete slabs on metal deck supported by steel beams and columns at Level 1B and above. Below Level 1B, the structural framing consists of concrete slabs and beams supported by concrete columns. The foundation system consists of a continuous concrete footing along the exterior walls, according to previous reports.

Martin/Martin conducted a building condition assessment on August 27, 2013 of the Centennial building located at 1313 Sherman Street in Denver, Colorado. The purpose of our condition assessment was to identify structural defects, damage and deterioration.

The structural framing that was readily observable is in good condition. Minor to moderate cracks/spalls were observed in the concrete floors and columns in the sub-basement levels. The concrete spalls on the columns in Level 3B should be repaired to protect the reinforcing and prevent further deterioration. Leaks were reported on Level 3B beneath the loading dock. At the time of our site visit, the area was dry and the source could not be identified. The source of the leaks should be investigated further to prevent additional deterioration due to water damage.

Minor concrete spalls and cracks were observed along the exterior of the building. The spalls should be repaired to prevent water intrusion and falling debris that could injure pedestrians below.

The precast panel lifting points along the roof parapet have corroded and spalls are occurring. The lifting points require repair to prevent additional deterioration.

A small amount of corrosion on the metal deck was observed at the underside of the roof. No repair is required at this time. The source of the leak should be investigated further and repaired to prevent additional deterioration.

The penthouse roof does not have a parapet or any type of fall protection, exposing employees to fall hazards of greater than 15 feet. A fall protection system should be developed and installed to comply with current safety codes.

1.0-C CIVIL OVERVIEW

The Centennial building site is approximately 1.33 acres. The existing site consists of the Centennial building, a parking area to the north and street right-of-way including sidewalk and landscaping. The main building entrance is accessed from Sherman Street. The condition of the site surrounding the building is consistent with an estimated age of 40 years.

The site exterior is generally in fair condition. There are numerous locations around the building with broken and cracked concrete in need of repair or replacement. Broken concrete in walking paths are a tripping hazard and a high safety concern. The main concern regarding the Centennial site is the proximity of the irrigation lines near the building. Although the perimeter of the building where the irrigation lines are located is composed of rock and the lines may not be used frequently, irrigation here causes concern. Watering close to the building can saturate the foundation, causing settlement and numerous other problems that could compromise the building structure. The irrigation should be relocated immediately. Additionally, the timber landscape beds should be removed and no future beds or turf be installed near the perimeter of the building. While the existing building functions in its current state, improvements can be made to prevent future problems, prevent public safety issues, and improve aesthetics.

1.0-D MECHANICAL, ELECTRICAL, AND PLUMBING OVERVIEW

A site survey for the facility was performed to observe the existing electrical and mechanical equipment installation and assess code and building energy efficiency issues. During the site survey, information was provided about the building history and on the electrical and mechanical systems conditions, maintenance routines, and installation dates. The Centennial building is approximately 201,746 sq. ft, consisting of eight stories and three levels of basement. The building was built in 1976.

The main concerns regarding the Centennial Building are related to the fire alarm system, and the HVAC distribution system. The fire alarm system needs to be replaced with the new Notifer system used in the other government buildings. Also the elevators need to have a recall system added.

The HVAC distribution system on all floors is inefficient and does not meet the space heating and cooling requirements. The main Air Handling Units appear to be in good condition however they need some modifications to include heating coil within the unit. Providing new HVAC distribution system and controls will improve the comfort conditions in the building. Proper distribution of airflow in the spaces will ensure there are no hot and cold spots in the building. The variable air volume distribution system will vary the airflow delivered in the space based on space requirements, thereby saving fan energy and heating and cooling energy. The ventilation system in the basement is not adequate (does not meet code requirement), therefore, the existing system needs to be upgraded to meet the space usage needs.

The new steam to hot water heat exchangers will generate hot water from central steam. The effectiveness of these heat exchangers will be high thereby saving heating energy costs. The possibility of having dedicated high efficiency boilers for the building should be investigated. This will change the dependence of building heating on steam supply.

The sprinkler system in the building appears to be original to the building. The sprinkler piping will need to be tested for wall thickness since over the years the corrosion must have eroded the pipes internally thereby reducing the pipe thickness. From the life safety perspective it might be advantageous to replace the sprinkler pining. As a minimum the sprinkler heads will need to be replaced with new heads at the time of HVAC renovation. The new HVAC distribution system will be as per current code requirements. Fire/smoke dampers will be provided for all ducts passing through rated walls. The fire alarm is also a life safety system and is critical to protect life and property.

The plumbing piping is original to the building and is susceptible to frequent leaks and repairs. It is recommended to replace the plumbing piping in the building.

Energy Conservation

To conserve energy in this building a lighting control system that provides automatic daylight dimming and occupancy sensor shutoff will provide energy savings. Also, following the most up-to-date energy codes regarding how much light is used (watts per square feet) will reduce the number of fixtures required for each space. Supplemental task lighting can be used on the desk or in the cubicles to ensure occupants are able to perform their work effectively.

Since the tenants in the building can be different, sub-metering on each panelboard will help keep track of power usage. This will help notify building users of excess use of power so adjustments can be made to their usage.

Providing automatic occupancy sensor shutoff power strips for desk equipment that does not need to be on constantly, when a person is away from their desk, will help reduce energy usage.

The new HVAC air distribution system will work more efficiently thereby saving heating and cooling energy costs. It will also improve indoor comfort conditions thereby improving employee productivity. The proposed modifications of Air Handling Unit will provide better heating control and will reduce heating energy costs. Adding DDC controls to the HVAC system will ensure that the required amount of outside air is introduced into the system and delivered to spaces. This will not only save energy in heating and cooling outside air but will also improve indoor environment which will improve employee productivity. Some of the energy savings control features such as static pressure reset, supply air temperature set back, and hot water reset could be implemented to save HVAC operational energy costs.

SHEN MILSOM WILKE

1.0-E VOICE AND DATA OVERVIEW

The Voice and Data IT/Telecommunications Infrastructure assessment and findings report provides requirements and recommendations for the implementation of the IT/Telecommunications Infrastructure required to support Voice/Data and other technology systems within the Centennial Office building. It is determined that much of the building's existing IT/Telecommunications infrastructure is not compliant with current industry standards and best practice installation methods. The current infrastructure will not fully support many newer technology IP devices which are now considered to be standard in the industry such as VoIP phones and PoE type security cameras. The existing Cat5e cabling has bandwidth limitations as compared to that of more robust, industry standard Cat6/6A cable plant specifications. The IT systems infrastructure not only includes the cabling, but the cabling pathways and the spaces that support the network cabling system. Technology spaces required to be provisioned for include the Main Distribution Facility (MDF) room in the basement or sub-basement, and Intermediate Distribution Facility (IDF) rooms on levels 1 thru 8. This building is large enough that two IDFs per floor should be included. The infrastructure will required proper cabling pathways between MDF/IDF rooms, to support installation of both fiber and copper backbone cabling. Singlemode and laser optimized multimode fiber optic cables, along with Category 3 copper backbone cables will be installed from the MDF room to each IDF room to support the technology systems. New Category 6 network cable will be required from network outlets and IP field devices to termination hardware in the IDF rooms using appropriate conduit and cable tray horizontal pathways. A proper grounding and bonding system must be provisioned for in MDF/IDFrooms, which will provide a uniform ground to ensure safe and reliable operation of the communications equipment and systems. The findings and recommendations report is to be used for IT/Telecom Infrastructure program development, space planning, and implementation of design criteria. Industry standard best practice design methods will be required to be followed, including BICSI and TIA/EIA design and construction guidelines. Applicable State Office of Information Technology (OIT) design criteria documents should be followed.

The following list prioritizes voice/data infrastructure upgrades required:

1. Necessary: Retrofit facility with proper MDF/IDF room distribution, which meets industry standard for telecommunications structured cabling system.
2. Necessary: Replace horizontal copper station cabling with Cat 6 network cabling.

3. Necessary: Replace vertical and network back-bone cabling with appropriate copper and fiber optic cabling.
4. Necessary: Provision voice/data infrastructure to support wireless access points (WAPs), to allow for wireless network coverage throughout facility.

1.0-F SECURITY SYSTEMS OVERVIEW

The security systems design guidelines outline electronic security systems infrastructure which will enhance security operations and provide a safe and secure environment for persons and assets within the Centennial Office Building. The security systems should be planned and designed to allow the security personnel the operational flexibility to provide various levels of security based on the threat level at a given time. Security systems should be designed such that they may be monitored remotely from centralized security monitoring locations. Best practice security design methodology should be applied, including crime prevention through environmental design (CPTED), layered security, integrated design, and concentric circles of protection. Additionally it is recommended that the following document be used a guideline for developing specific security design criteria for renovations: ASIS Facilities Physical Security Measures, IESNA G-1-03 Guideline for Security Lighting, Unified Facilities Criteria UFC 4-010-01.

For renovation projects, applicable State construction standards and design guidelines must be followed. Electronic security systems to be considered for implementation or upgrade include access control, intrusion detection, duress alarm, intercom, video surveillance, and emergency call system. The access control system (ACS) will be an expansion of the existing campus wide system currently installed throughout other State buildings. The ACS shall also serve as the primary security management system for monitoring intrusion alarms. The video surveillance system (VSS) should be comprised of IP digital cameras integrated with the existing VSS. The State's existing wireless duress alarm system infrastructure should be expanded where needed to support new locations of wireless duress buttons.

Existing security systems in State facilities are generally controlled and monitored centrally from Colorado State Patrol's Central Command Center (CCC), located in Denver CO.

Within the building, new head-end security control equipment is to be located in IDF or technology rooms, as coordinated with State IT technical staff. Equipment may include ACS control panels, power supplies, duress alarm panels, network video recorders, and UPS units.

All critical electronic security equipment should be backed-up with emergency power circuits or UPS units. State security personnel and other authorized staff may remotely monitor access control events, system alarms, and security video through network connected client workstations.

For the Centennial Office Building renovation work, requirements for security

device additions/upgrades and specific security system functionality are to be coordinated with State security personnel during design and construction phases.

The following list prioritizes security system upgrades required:

1. Necessary: Replace/Repair existing Hirsch Access Control card readers.
2. Necessary: Replace analog security cameras with IP PoE minimum 1.2MP cameras.
3. Necessary: Replace existing coaxial CCTV cabling with CAT 6 network cabling, required to support item 1 above.
4. Necessary: Verify functionality of access control devices and perimeter door alarms, replace if defective. Provide door sensor alarm on all perimeter doors.
5. Necessary: Verify functionality of wireless duress alarms. Provide duress alarms for all public interface counters and cash handling areas.
6. Recommended: Install IP security camera within main entrance/lobby.
7. Recommended: Install intercom station at facility main entrance door exterior. Must be intercom-over-IP (IoIP) based PoE intercom stations. Install IP camera to view intercom.

Consideration should be given in regards to the Installation and mounting details for any security related renovations. Due to the uniqueness of the buildings under consideration, design plans must be cognizant of maintaining the historical attributes of the buildings.

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2.0 OVERALL BUILDING ASSESSMENT FINDINGS AND RECOMENDATIONS

2.1 ARCHITECTURE

2.1-A EXTERIOR BUILDING ENVELOPE/SITE

General

The Centennial Building is a ten-story high-rise building, consisting of a steel beam and metal deck construction with a concrete frame. The facade is clad in precast aggregate panels composed in an overall symmetrical grid design with linear rows of windows running the length and height of the building. The building has three entrances located on the east, north, and west sides. The main entrance is off of Sherman Street on the east side of the building and serves the First Floor. The north entrance serves the 1B (Basement) Floor and leads to an exterior terraced garden area with tables and seating. The west entrance off of Lincoln Street serves the 2B (Sub-basement) Floor. The roof contains a one-story elevator penthouse set back from the elevations of the building and is also clad in precast aggregate panels. In general, the building envelope is in fairly good condition. Various elements are showing the effects of deferred maintenance, others are simply damaged or worn out. Some minor damage has resulted from poor expansion and control joint detailing.

It was reported that there is currently no insulation in the exterior walls of the building. It was further reported that the lack of insulation has made it difficult to maintain the temperature within the building. It was reported that the building's exterior is in bad condition. It was also reported that repairs to the exterior walls, retaining walls, and window leaks are on the Capitol Complex list of controlled maintenance projects that need to be addressed.

Front & Side/East & North elevation of the Centennial Building

Back & Side/West & South elevation of the Centennial Building

Front/East Sherman Street Entrance

Cladding

The readily observable precast aggregate panels have become dirty over the years but appear to be in generally good to fair condition, with a few exceptions. A small number of panels along the corners of the building have minor spalling (see Fig.2.1.A.1 and Fig. 2.1.A.2). The south-east corner of the building has a loose piece of aggregate that has broken off and is wedged between the third and fourth stories (see Fig. 2.1.A.3). This presents a life safety hazard to pedestrians in the vicinity of the building. Minor cracks were observed in the panels under the windows on the 1B (Basement) Floor along the north side of the building. The sealant between the joints of the panels was observed to be in fair condition overall with general deterioration noted around the building. It was reported that there is no backer rod currently behind the sealant and that this is causing large popping sounds inside the building during windy weather conditions.
It was reported that the building's exterior is in bad condition. Forensic investigation of the building exterior is recommended.

Fig. 2.1.A.1 Spalling at an exterior corner of the building.

Fig. 2.1.A.2 Spalling at an exterior corner of the building.

Fig. 2.1.A.3 Piece of aggregate lodged in the side of the building at the south-east corner.

The panels along the north side of the Penthouse at the Roof Level are in poor condition with extensive cracking (see Fig. 2.1.A.4) and shedding of the aggregate (see Fig. 2.1.A.5). The cracks were poorly repaired at some point and the sealant that was used has stained the panels (see Fig. 2.1.A.6). Spalling was observed along the inside face of the parapet at the control joints (see Fig. 2.1.A.7). Sealant failure between the panels and along the control joints is widespread and freeze/thaw damage to the panels and corrosion of the panel attachment clips is likely resulting (see Fig. 2.1.A.8 and Fig. 2.1.A.9).

Fig. 2.1.A.4 Cracked panels, Penthouse Level.

Fig. 2.1.A.5 Aggregate shedding from Penthouse panels.

Fig. 2.1.A.6 Poor sealant repair and resulting staining of precast aggregate Penthouse panels.

Fig. 2.1.A.7 Spalling at control joint, inside face of roof parapet.

Fig. 2.1.A.8 Sealant failure at control joints.

Fig. 2.1.A.9 Sealant failure at joints between precast aggregate panels.

Recommendations:

- Clean soiled precast aggregate panels.
- Repair or replace damaged precast aggregate panels at the south-east and south-west corners and under the windows of the 1B (Basement) Floor on the north side of the building.
- Remove and replace the damaged precast aggregate panels on the north side of the Penthouse on the Roof.

- Remove loose pieces of aggregate from the side of the building.
- Examine all precast aggregate panel support clips for evidence of damage or corrosion and repair or replace.
- Remove existing sealant around panels and in control joints and replace with new sealant. Install backup materials as necessary. Sealant, backup materials, and preformed joint fillers shall be nonstaining. Materials impregnated with oil, bitumen or similar materials should not be used.
- Further forensic investigation is required prior to any recommendations regarding the potential complete replacement of the exterior building skin. Replace the exterior building skin based on further findings and coordinate with the timing of the complete renovation of the building recommended in this report and with the precast aggregate panel recommendations above.
- Further forensic investigation is required prior to any recommendations regarding the potential installation of insulation at the exterior walls of the building. Install insulation as necessary based on further findings and coordinate with the timing of the complete renovation of the building recommended in this report.

Glazing Systems and Doors

The windows from the First Floor and up are single-pane, operable windows that are original to the building (see Fig. 2.1.A.10). The windows at the 1B (Basement) Floor are the only windows in the building that are double-pane. Sealant failure around the windows is widespread and is likely contributing to the minor corrosion of the window frames (see Fig. 2.1.A.11).

Fig. 2.1.A.10 Single-pane, operable windows.

Fig. 2.1.A.11 Sealant failure around windows.

It was reported that the exterior entrance doors around the building are no longer closing properly. It was reported that the doors and framing at Patio 1B at the front entry should be replaced. It was also reported that the exit door due north of the passenger elevator on Floor 2B, below the Floor 1B patio doors, is bound shut because of settling and is in need of concrete repair and door and frame replacement.

Recommendations:

- Replace existing windows with new energy efficient windows and frames.
- Remove existing sealant around all windows and replace with new sealant. Sealant, backup materials, and preformed joint fillers shall be nonstaining. Materials impregnated with oil, bitumen or similar materials should not be used.
- Determine the cause of closure issues at the exterior entrance doors around the building and repair or replace as necessary.

Roof

The main roof is ballasted and is thin in spots, exposing the roof membrane (see Fig. 2.1.A.12). With the recent rain, major leaks were reported. The roof

drains are in good condition with minor wear to the powder-coating, but no signs of corrosion were observed. The flashing around the base of the Penthouse is in poor condition with corrosion observed (see Fig. 2.1.A.13). The ladder leading to the top of the Penthouse is corroding and it was observed that the Penthouse Roof is non-ballasted PDM with bubbling at the south-west corner. The date of the last roof replacement, and therefore the remaining warranty, if any, is unknown.

It was reported that when the roof is replaced, a non-ballasted type of roof would be preferred. It was reported that replacement of the deteriorated roof is on the Capitol Complex list of controlled maintenance projects that need to be addressed. It was also reported that the antennas need to be removed from the roof. It was further reported that the exterior electrical receptacles around the base of Penthouse walls are not equipped with ground-fault circuit interrupters (GFCI) per code requirements.

Fig. 2.1.A.12 Area where ballast is thin and roof membrane is exposed.

Fig. 2.1.A.13 Corrosion of flashing around the base of the Penthouse.

The doors and door frames to the roof are rusting (see Fig. 2.1.A.14 and Fig. 2.1.A.15).

Fig. 2.1.A.14 Rusting door and door frame to the Penthouse and cracked precast panel.

Fig. 2.1.A.15 Rusting door to the Penthouse.

Recommendations:

- Replace the existing main roof and Penthouse roof with a new roofing system, including roof drains, and flashing around the perimeter of the Penthouse and the parapet. Determine the appropriate type of roof to

replace the existing roof per reports that a non-ballasted type of roof would be preferred.

- Repair or replace the existing doors and door frames.
- Install ground-fault circuit interrupter (GFCI) protection at all electrical receptacles required to be equipped with GFCI protection per the National Electrical Code (2011).

Entrance Canopies

The East, Sherman Street Entrance and the North Entrance canopies both show obvious signs of water damage from below (see Fig. 2.1.A.16).

Fig. 2.1.A.16 Water damage observed under the east Sherman Street Entrance canopy.

Recommendations:

- Verify cause of water damage and repair or replace the required elements as necessary.
- Repair areas damaged by water.

Site Elements

The wood railroad ties surrounding the raised bed outside of the East, Sherman Street Entrance are damaged and have exposed nails (see Fig. 2.1.A.17). This presents a life safety hazard to pedestrians in the vicinity of the building.

It was reported that there is no drain at the loading dock area and that water is pooling in this location during wet weather conditions. See 2.2-A Structural: Exterior Building Envelope.

Fig. 2.1.A.17 Damaged railroad ties with exposed nails at raised landscaping bed along the east Sherman Street facade.

Recommendations:

- Replace damaged railroad ties and remove loose nails surrounding raised landscaping beds.
- Further investigate the drainage issues reported at the loading dock area and repair or upgrade as necessary.

2.1-B CODE ISSUES

Applicable Codes

The following approved building codes and standards adopted by State Buildings Programs (SBP) and other state agencies are identified as the minimum requirements to be applied to all state-owned buildings and physical facilities including capitol construction and controlled maintenance construction projects, as revised 7/2013.

The 2012 edition of the International Building Code (IBC)

(as adopted by the Colorado State Buildings Program as follows: Chapter 1 as amended, Chapters 2-35 and Appendices C and I)

The 2012 edition of the International Energy Conservation Code (IECC)

(as adopted by the Colorado State Buildings Program)

The National Fire Protection Association Standards (NFPA)

(as adopted by the Department of Public Safety/Division of Fire Safety as follows with editions shown in parentheses: NFPA-1 (2006), 11 (2005), 12 (2005), 12A (2004), 13 (2002), 13D (2002), 13R (2002), 14 (2003), 15 (2001), 16 (2003), 17 (2002), 17A (2002), 20 (2003), 22 (2003), 24 (2002), 25 (2002), 72 (2002), 409 (2004), 423 (2004), 750 (2003), and 2001 (2004))

The 2007 edition of ASME A17.1 Safety Code for Elevators and Escalators

(as adopted by the Department of Labor and Employment/Conveyance Section and as amended by ASME International)

The 2005 edition of ASME A17.3 Safety Code for Existing Elevators and Escalators

(as adopted by the Department of Labor and Employment/Conveyance Section and as amended by ASME International)

The 2003 edition of ICC/ANSI A117.1, Accessible and Usable Buildings and Facilities

(as adopted by the Colorado General Assembly as follows: CRS 9-5-101, as amended, for accessible housing)

Note: It is anticipated that compliance with the federal Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG) and Colorado Revised Statutes Section 9-5-101 will be met by compliance with the 2012 International Building Code and ICC/ANSI A117.1. However, each project may have unique aspects that may require individual attention to these legislated mandates.

Building Construction Type

The building is 10 stories tall and has a total floor area of 207,091 square feet. If this building was built today, it would be classified as Occupancy Group B (primary use as a Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts) according to IBC's Table 503 and the building would be classified as Construction Type IB, which allows for 11 stories and 160 feet in height, and unlimited floor area. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the value specified in Table 503 for maximum height is increased by 20 feet and the maximum number of stories is increased by one.

Egress Issues

Alterations, repairs, additions, and changes of occupancy to, or relocation of, existing buildings and structures shall comply with the current provisions for alterations, repairs, additions and changes of occupancy or relocation. As an existing building, the Centennial Building is exempt from current code requirements for new construction as long as minimal renovation is done. If the building undergoes extensive renovation, the following issues may need to be addressed per current code requirements.

Occupants on the sub-basement level 3B have only one means of egress through the east stairwell. It is assumed that the storage areas on levels 1B, 2B, and 3B consist of books and other paper documents stored by the Division of State Archives and Public Records and do not include the storage, handling and use of any hazardous materials (flammable or

otherwise). According to the 2006 Edition of the National Fire Protection Association Standards (NFPA), these areas would therefore fall into the category of Ordinary Hazard Storage Occupancies. Section 42.2.4.1 states that a single means of egress shall be permitted from any story or section in ordinary hazard storage occupancies provided that the exit can be reached within the distance permitted as a common path of travel. According to Table 42.2.5, the length of a dead-end corridor and the length of a common path of travel (protected by an approved, supervised, automatic sprinkler system) is 100 feet. Further, according to Table 42.2.6, the maximum travel distance to exits for an ordinary hazard storage occupancy (protected by an approved, supervised, automatic sprinkler system) is 400 feet. Finally, according to section 7.3.4.1.2, the minimum width of any means of egress from an Ordinary Hazard Storage Occupancy in existing buildings must be a minimum of 28 inches. The longest distance of travel to the east stairwell that exists at sub-basement level 3B, according to the floor plans provided by the Owner, is ±200 feet which is well within the 400 feet allowed. In the areas included in the site survey visit, the longest common path of travel is approximately 105 feet long which is just over the 100 feet allowed. The vast majority of the storage areas on level 3B were locked and not accessible during the site survey visit, preventing the ability to determine the width of aisles or the length of existing dead-end corridors and common paths of travel associated with these areas. The length of the longest common path of egress travel and the occupancy loads of each floor should be verified as part of any future renovation plan.

According to Table 1016.2 of the IBC (2012), the exit access travel distance in a B-type occupancy with a sprinkler system is 300 feet. The plans provided by the Owner appear to indicate that the greatest distance of travel in the building, as it currently exists, comply with this code requirement. Depending on the fire-resistance ratings of the interior exit stairways, the distance of travel through the stairways to a public way may be included in the greatest distance of travel calculation if the building undergoes extensive renovation. Assuming the interior exit stairways meet required fire-resistance ratings, the greatest distance of travel would only be measured to the exit stairway door instead of to the public way which currently appears to comply with code requirements. The length of the greatest distance of travel and the occupancy loads of each floor should be verified as part of any future renovation plans.

The fire rating of the doors to the interior exit stairways is unknown. According to Section 1022.2 of the IBC (2012), enclosures for interior exit stairways and ramps shall be constructed as fire barriers in accordance with Section 707. The interior exit stairway and ramp enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories

or more and not less than 1 hour where connecting less than four stories. The number of stories connected by the interior exit stairways or ramps shall include any basements, but not any mezzanines. Interior exit stairways and ramps shall have a fire-resistance rating not less than the floor assembly penetrated, but need not exceed 2 hours. The Centennial Building has 10 stories and must therefore provide a fire-resistance rating of not less than 2 hours at the interior exit stairways. Further, according to Table 716.5 of the IBC (2012), where fire walls and fire barriers have a required fire-resistance rating of 2 hours, the minimum fire door and fire shutter assembly rating is 1-1/2 hours. We assume that the interior exit stairways meet the code requirements but were unable to confirm the fire-resistance ratings.

It was reported that all of the interior doors throughout had unit locks at one time and that these were previously replaced with accessible lever-style door handles. The doors are no longer fire-rated due to the alterations required to install the accessible lever-style door handles.

Recommendations:

- Verify the fire-resistance ratings of the existing interior exit stairways doors and upgrade as necessary.
- Verify the fire-resistance ratings of the interior doors throughout and replace as necessary per code requirements.

Fire Suppression Systems/Fire Department Access

There is a fully automatic sprinkler system throughout the building (see Fig. 2.1.B.1). It was reported that there have been several known failures with the sprinkler heads.

Fig. 2.1.B.1 Typical automatic sprinkler system configuration found throughout the building.

Recommendations:

- Replace the automatic sprinkler system throughout as part of a complete renovation of the building.

Stairs and Ramps

In general, the exit stairs comply with the code requirements for stairs, with the exception of the handrails. The spacing between the handrail posts exceeds the code-maximum of four inches (Fig.2.1.B.2).

Fig. 2.1.B.2 Exit stair railings.

Recommendations:

- Replace the existing handrails with a new handrail system that complies with the code requirement of a maximum of 4 inches of space between handrails.

Doors

The interior doors throughout the building include a mix of lever-style and knob-style door handles (see Fig. 2.1.B.3). According to Section 309.4 Operation of the 2003 edition of ICC/ANSI A117.1, the knob-style handles do not meet the requirement that: operating mechanisms shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. Section 309.4 Operation further states that the force required to activate operable parts shall be 5.0 pounds (22.2 N) maximum.

Recommendations:

- Replace all knob-style handles on the interior doors with lever-style handles.

Security

There is no reception desk or check-in area in the building. The Sherman Street Entrance on the east side of the building at the First Floor is the means of public access to the building and is open during regular business hours. There is a key-code entry system which allows employees to access the building outside of regular business hours.

2.1-C GENERAL ACCESSIBILITY ISSUES

The majority of the restrooms in the building appear to comply in general with accessibility standards. The typical non-compliant instances that were observed throughout the building include non-insulated lavatory pipes (see Fig. 2.1.C.1) and knob-style lavatory faucets. It was also noted that there are instances where insulation that exists around accessible lavatory pipes is damaged or coming loose (see Fig. 2.1.C.2). Non-accessible restrooms exist in the two sub-basements on Levels 2B and 3B.

The drinking fountains throughout the building are non-accessible (see Fig.2.1.C.3) with the exception of one accessible fountain that exists on the east side of the Third Floor.

Fig. 2.1.C.1 Accessible lavatory without insulation wrapped around the pipes.

Fig. 2.1.C.2 Insulation coming loose around an accessible lavatory pipe.

Fig. 2.1.C.3 Typical non-accessible drinking fountain found throughout the building.

Recommendations:

Note: A complete renovation of the building is recommended, including the restrooms. However, if a complete renovation of the building is not possible, the following recommendations should be implemented:

- Install automatic door openers to restrooms where not provided.
- Reconfigure non-accessible restrooms to include required wheelchair maneuvering clearances and a minimum of one accessible toilet stall per restroom.
- Install a minimum of one ADA compliant lavatory per restroom where not provided.
- Replace any existing knob-style faucets on accessible lavatories with lever-style faucets.
- Repair or replace any damaged insulation around the accessible lavatory pipes.
- Install insulation around accessible lavatory pipes where not provided.
- Replace all non-accessible drinking fountains with accessible drinking fountains throughout.

2.1-D ELEVATORS

It was reported that there were some recent updates to the cabs of the elevators, although the date and extent of the updates was unknown. The age of the equipment in the elevator electrical/mechanical rooms was also unknown. It was reported that the elevator recall during generator use does not work. It was also reported that the elevator cabs and equipment need to be updated. It was further reported that modernization of the elevators is on the Capitol Complex list of controlled maintenance projects that need to be addressed.

Recommendations:

- Verify the age of the elevator cabs, electrical, and mechanical equipment to determine if any warranty is still in effect.
- Update the elevator cabs, electrical, and mechanical equipment as necessary.

2.1-E ENVIRONMENTAL

It was reported that asbestos is present in the building but not to such an extent that phasing of the construction would be eliminated as a possibility. It was reported that there is asbestos present in the mastic of the vinyl composition floor tiles. It was also reported that all of the t-style and elbow-style piping needs to be tested for asbestos.

Based on the construction date of the building, it is possible that surfaces are painted with paint containing lead.

Recommendations:

- All asbestos within the building should be abated and all personnel should be removed from affected areas during construction.
- Sampling for lead paint must be completed if any painted surfaces will be sanded.

2.1-F PLANNED AND ON-GOING PROJECTS

There are no known planned and on-going architectural projects for the building currently.

2.2 STRUCTURAL

2.2-A EXTERIOR BUILDING ENVELOPE

The building's exterior appears to be in fair condition with the exception of a few areas. Small spalls were observed along the exterior of the building (Fig. 2.2.A.1).

Fig. 2.2.A.1

Minor cracking was observed around the windows along the northwest wall at Level 1B (Fig. 2.2.A.2). The cracks are not a structural concern at this time and should be monitored for additional movement.

Fig. 2.2.A.2

The precast panel lifting points are corroding and have spalled the grout from the pockets (Fig. 2.2.A.3). The spalled grout allows water to collect in the pockets and cause additional corrosion and spalling.

Fig. 2.2.A.3

Recommendations:

- Repaired spalled areas at the veneer panels to prevent further deterioration and injury to pedestrians below.
- Remove existing corrosion from the precast panel lifting points and place new grout in the pockets to prevent further deterioration and corrosion.

Items noted above do not pose any structural loading issues based on the current use. Repairs are to maintain performance and reduce further deterioration.

2.2-B BUILDING INTERIOR

The overall condition of the structural framing that was readily observable was good. Spalls were observed at two of the concrete columns on Level 3B adjacent to the loading dock (Fig. 2.2.B.1 and Fig. 2.2.B.2). The masonry infill at the south and east areas of the loading dock is showing signs of distress.

Leaks were reported on Level 3B beneath the loading dock (Fig. 2.2.B.1). The area appeared to be dry at the time of our site visit and access into the locked area was not provided. The source of the leaks should be investigated further so that the proper repair recommendations can be made. A previous leak on the east side of Level 3B was reported. At this location, it was reported to have been repaired with application of a waterproofing membrane on the exterior of the building.

Fig. 2.2.B.1

Fig. 2.2.B.2

Cracks were observed on the concrete floor throughout Level 2B (Fig. 2.2.B.3). The cracks are minor to moderate in size.

Fig. 2.2.B.3

Corroded steel decking was observed at the roof level on the north side of the elevator lobby (Fig. 2.2.B.4). The steel deck acts as the formwork for the concrete slab and is not a structural concern. The water leak should be repaired to prevent additional deterioration.

Fig. 2.2.B.4

Interior walls were constructed tight to the structural framing. Deflection of the structural framing may cause cracking in the walls and cause additional loading of the floor below.

Recommendations:

- Repaired the spalled and cracked concrete on the columns on Level 3B to prevent further deterioration and corrosion.
- Determine the source of the leak at the loading dock and repair to prevent further deterioration.
- Monitor the condition of the cracks and levelness of the floor throughout Level 2B. Additional cracking or change in floor levelness should be investigated further.
- Further investigate the source of the roof leak and repair to prevent water intrusion and additional corrosion of the steel decking.
- Install slip joints between the tops of the non-load bearing interior walls and structural framing to allow for differential movement between the two adjacent floors.

Items noted above do not pose any structural loading issues based on the current use. Repairs are to maintain performance and reduce further deterioration.

2.2-C FALL PROTECTION

No parapets were provided along the penthouse roof (Fig. 2.2.C.1). The fall in this area is approximately 15 to 20 feet to the roof below. A fall protection system should be provided for access near the exposed edges to meet current safety codes.

Fig. 2.2.C.1

Recommendations:

- Design and install fall protection systems for safe access near exposed edges.

2.2-D PLANNED AND ON-GOING PROJECTS

N/A

2.3 CIVIL

2.3-A EXTERIOR BUILDING ENVELOPE/SITE

General

The Centennial building is located on the northwest corner of E. 13th Avenue and Sherman Street with an address of 1313 Sherman Street in Denver, Colorado. The building is bordered by a parking garage to the west, the State Capitol Annex to the north, and office buildings to the east and south. The Centennial building site is approximately 1.33 acres. The existing site consists of the existing building, a parking area, and street right-of-way including sidewalk and landscaping. The main building entrance is accessed from Sherman Street (Fig. 2.3.A.1). The site surrounding the building is deteriorated and consistent with a building approximately 40 years old. NOTE: Description of existing infrastructure is based on public utility information provided by the City and County of Denver.

Figure 2.3.A.1 – Centennial Building Sherman Street Entrance

Grading and Drainage

The site slopes from generally from east to west at grades ranging from 1-8%. The high point of the site is at the southeast corner, at the intersection of 13th and Sherman. The site slopes south towards E. 13th Avenue at approximately 0.5-2% and west towards Lincoln Avenue at approximately 6-8%. Existing runoff is conveyed overland away from the building towards

the streets. Runoff is collected by street inlets (Fig. 2.3.A.2) and conveyed by storm sewer west within E. 13th Avenue.

The Sherman Street entrance is accessed via a concrete apron (Fig. 2.3.A.3). The building is set back from the public sidewalk and treelawn (Fig. 2.3.A.4). Landscaped areas are flat containing grass, established trees and bushes. Bordering the existing building are landscape beds constructed of timber and containing rock, mulch, and bushes (Fig. 2.3.A.5). The parking area is generally flat, draining to a low point and area drain at the southwest side (Fig. 2.3.A.6). The foundation of the building appears to be stable with no obvious external signs of settlement.

Figure 2.3.A.2 – Street Inlet

Figure 2.3.A.3 – Main Entrance Apron

Figure 2.3.A.4 – Public Sidewalk and Treelawn

Figure 2.3.A.5 – Landscape Beds

Figure 2.3.A.6 – Parking Garage Area Drain

The site is located in the Denver Storm Drainage Master Plan Basin 4600-01 (Central Business District). This basin consists of 2.67 square miles and conveys the 2, 5, and 100-year storm event via both storm sewer and roadway conveyance. Runoff from the major basin is conveyed westerly to Cherry Creek, ultimately discharging to the South Platte River. Within this basin, storm sewer facilities typically are designed to convey the 5-year rainfall event at a minimum and it is assumed the same for this area of the City.

The effective Flood Insurance Rate Map (FIRM Map Number 0800460201G, effective date November 17, 2005) shows the property lies within Zone X, areas designated as outside of the 500-year floodplain. To our knowledge, there are no known existing flood control problems or drainage issues at the Centennial site, however the Parking Garage Area Drain should be removed and re-installed to be located in a sump condition. It was reported that the inlet does not collect water effectively as runoff drains around the concrete ring before entering through the grates.

Recommendations:

- Remove Parking Garage Area Drain and re-grade area to install inlet in a sump condition.

Utility Services

The building utility demands are unknown at this time. There are multiple utility lines located nearby within the public streets. There is an 8" water line located within 14th Avenue and a 10" water line located within Sherman Street. There are no known pressure problems at this time.

The Centennial building is served by a sanitary sewer service line connecting to a 9" sanitary sewer main within Sherman Street. Sanitary sewer is routed northerly at a 0.79% slope. There is also a sanitary sewer main located within Lincoln. This sewer is also 9" and is routed northerly at a 0.6% slope and connects to the 12" line within E. 14th Avenue via a manhole. There are no known sanitary sewer capacity problems at this time.

The storm sewer within E. 13th Avenue is 24" in size. There is no storm sewer within Sherman Street.

Existing dry and regulated utilities (electric and telecommunications) are located in 14th Avenue.

Figure 2.3.A.7 – Street Utilities

Site Paving

Numerous locations of broken concrete and concrete cracking was observed. Repair or replace broken or cracked concrete.

Figure 2.3.A.8 Site Broken Concrete Curb, Recommended for Replacement

Figure 2.3.A.9 Site Concrete Crack

Figure 2.3.A.10 Site Concrete Crack, Recommended for Replacement

Recommendations:

- Cracks approximately 1/8" wide or smaller showing no differential movement can be sealed using an approved joint sealant. Cracks should be routed and cleaned per an approved industry method prior to sealing.
- Concrete panels showing numerous excessive cracking and/or differential movement should be replaced.
- Replacement shall be completed in full stone segments, i.e. to the nearest joint location. Repair the subgrade materials and place new curb & gutter or sidewalk. Replace backfill materials and repair/ replace any landscaping/paving disturbed during repair operations.

2.3-B CODE ISSUES

The site exterior was analyzed for general conformance with ADA; however a complete accessibility audit is not included in the scope of services. Building entrances and walks appear to comply with current standards but broken concrete and uneven walks which cause a tripping hazard should be replaced.

Site slopes were analyzed by visual inspection and topography provided by the City and County of Denver for drainage and ingress and egress.

The landscaped areas surrounding the building are generally flat. Current geotechnical recommendations and standard practice for slopes away from the building are 10:1 for 10 feet and 2% in hardscape areas. The building does not appear to have these slopes but no adverse impacts to the building foundation were noted. It is recommended that all timber material used for landscape beds be removed and landscaped areas re-graded should be re-graded to provide slope away from the building and area drains should be installed. It is also recommended that no landscaping (including beds or grass) be installed near the perimeter of the building in the future.

The slope of the sidewalk along E. 13th Avenue appears to exceed 5%, which does not meet general ADA accessibility guidelines; but there is leniency since it is an existing building and public sidewalk. It is recommended to install handrails at locations of sidewalk slopes that exceed 5% if required for ADA. Additionally, a handicap ramp should be installed in the area shown in Figure 2.3.A.10.

An irrigation line was observed close to the foundation of the building (Fig. 2.3.B.1). Typical geotechnical recommendations do not allow irrigation within 10' of a building perimeter. Irrigation this close may cause wetting of the building foundation, which could lead to numerous problems including settlement. Although it appears that this irrigation may not be used regularly since the surrounding surface is mostly rock and mulch, this irrigation line should be relocated and watering methods re-evaluated.

Figure 2.3.B.1 Irrigation along the Building Perimeter

Local ponding was observed at the intersection of E. 13th and Sherman (Fig. 2.3.B.2). Although this area is within the public right-of-way, this area should be repaired and the asphalt and curb replaced to provide positive drainage. All improvements within the public right-of-way should comply with and be coordinated with the City and County of Denver.

Figure 2.3.B.2 Localized Ponding

Recommendations:

- Re-grade landscaped areas for current geotechnical recommendations for slopes away from the building.
- Remove all timber material used for landscape beds.
- Install area drains where proper slopes away from the building cannot be met.
- Prohibit landscaping (including beds or grass) installation near the perimeter of the building in the future.
- Install handrails in ADA paths where slopes exceed 5%.
- Relocate irrigation within 10' of the building foundation.
- Repair the intersection of E. 13th and Sherman to provide positive drainage. Replace asphalt and curb.

2.3-C PLANNED AND ON-GOING PROJECTS

The storm sewer within E. 13th Avenue adjacent to the Centennial site is planned to be upsized from 24" to 60" by the City and County of Denver. Per the City and County of Denver Storm Drainage Master Plan, dated June 2009, "a proposed 60-inch pipe east of Broadway, transitioning to a 72-inch west of Broadway will replace the existing 24-inch storm drain and provide 5-year capacity. This projects intercepts the existing storm drain in Grant Street at E. 13th Avenue, providing relief to the downstream system in Grant Street." It is unknown when this upsizing will be funded and constructed. There are no other known planned or on-going projects at the Centennial site at this time.

2.4 MECHANICAL, ELECTRICAL, AND PLUMBING

2.4-A OVERVIEW OF EXISTING SYSTEMS

ELECTRICAL SYSTEMS

Most of the Centennial building's electrical gear appears to be original. There are 13.2kV feeders that come into the basement that feed the building's 1500kVA transformer. The building transformer feeds a 480V, 2500amp switchgear in the basement which provides power to the rest of the building. The bus duct that feeds each floor in both electrical rooms is rated for 600amps. Both electrical rooms on each floor have 480/277V lighting panels that feed from the bus duct and 208/120V panels that feed through a transformer (see Fig. 2.4.A.1).

The penthouse electrical room contains a 600amp, 480/277V Motor Control Center (MCC) that feeds the elevators and other motor loads in the building. It also contains a 200amp, 480V Automatic Transfer Switch (ATS) from the generator in the garage. Part of the MCC appears less than five years old and the other part appears original to the building.

Fig. 2.4.A.1 - Bus duct in electrical rooms on each floor

Recommendations:

- Test the 1500kVA, 13.2kV transformer to determine remaining useful life. The transformer needs to be replaced; this will require a building outage and a temporary generator may be required depending on the

duration of the outage. The main 480V, 2500amp electrical gear and miscellaneous panels in the basement electrical room are near the end of their useful life and should be replaced.

- Replace all 208/120V panelboards (two to four per floor) that are over 30 years old including the feeders to them and the transformers feeding them.
- Replace all 480/277V panelboards (two per floor) that are over 30 years old including the feeders to them.
- Replace the 600amp, 480/277V MCC that is over 30 years old in the penthouse including the feeders to it from the source and the branch feeders to the loads.
- Replace all receptacles that are over 30 years old including all wire back to the panelboards feeding them. Remove the tombstone power system and replace with either in-floor power or power poles from the ceiling.
- Install an individual electrical meter on the building and provide additional meters at each floor to allow tracking of energy usage and to aid in the facilitation of conservation efforts.

Lighting

Most of the light fixtures appear to be original (see Fig. 2.4.A.2). The fixtures have been retrofitted with the more efficient T8 lamps and are fed by 277V. There are minimal controls for the light fixtures. There are no automatic controls, such as occupancy sensors or daylight dimming. The emergency lighting appears to be a mixture of old and new fixtures.

Fig. 2.4.A.2 – Old light fixtures

Recommendations:

- Upgrade all lighting to new LED light fixtures with more local switching, occupancy sensors, and daylight dimming. Update all of the emergency light fixtures.

Fire Alarm

The fire alarm system appears to be original (see Fig. 2.4.A.3, Fig. 2.4.A.4, Fig. 2.4.A.5). The building appears to have full detection and notification. The system is at its limits of capacity; when the fire pump was added a new panel was installed to serve it. There is a mass notification system on all floors and all panels are located in the fire command center. The server room has its own fire alarm system that appears to be less than five years old and appears to be up to code.

Fig. 2.4.A.3 - Old fire alarm system

Fig. 2.4.A.4 - Old fire alarm system

Fig. 2.4.A.5 - Old smoke detector

Recommendations:

- A completely updated fire alarm system is recommended except for the server room.

General Power

The receptacles are in bad condition and past their useful life (see Fig. 2.4.A.6, Fig. 2.4.A.7). The distribution system for the power in the office spaces is a Walkerduct Electrified Floor System (tombstone floor boxes) which is out of date and a tripping hazard and needs to be replaced.

Fig. 2.4.A.6 - Burnt out receptacle

Fig. 2.4.A.7 - No cover on receptacle

Recommendations:

- Replace all wire that is over 30 years old feeding to general loads in the building.

Electrical for Mechanical Systems

Most of the systems do not have the proper working clearance.

Emergency Power

This building has a new emergency generator located in the new garage (see Fig. 2.4.A.8). It feeds the life safety equipment in the building.

Fig. 2.4.A.8 - New emergency generator

MECHANICAL SYSTEMS

The cooling in the Centennial building is via chilled water from the central chiller plant located in the adjacent building. The heating in the building is provided by hot water generated via steam to hot water heat exchanger (shell and tube). The steam to the building is supplied by Xcel energy. The chilled water is supplied at 44 deg. F and steam is supplied at 25 psi which is reduced to 5 psi in the building before being distributed to the heating equipment. The controls in the building are Siemens direct digital.

The HVAC system for the building consists of two central Air Handling Units (AHU) located in the penthouse. The units were installed about seven years back and appear to be in good working condition. One unit serves the perimeter zones and the other unit serves the interior zone. These units serve floors one to eight. The AHUs consist of a fan section, cooling coil section, direct evaporative cooling section and an air intake section. The filter section, return air, and outside air intake section are external to the units located within the AHU rooms. The heating is provided by a unit heater located in the AHU room. Supply air to each floor is delivered via a supply air riser and network of ceiling ductwork. The AHU motor is on variable frequency drive and modulates airflow based on duct static pressure. The building's heating hot water is generated via shell and tube type steam to hot water heat exchangers located in the basement level 2 (B2) mechanical room. Hot water distribution to the heating equipment is via four zone pumps serving each perimeter zone (East, West North and South).

The air from central AHU is introduced into the rooms via variable air flow boxes/diffusers. These diffusers have manual adjustment for air temperature which varies the air flow in the space. There is no thermostat to control the space temperature. The heating in the spaces is provided by ceiling mounted heating panels around the perimeter of the building. Each floor has four zone sensors which control the perimeter heating panels. On call for heat, the zone pump associated with that zone is activated and delivers hot water to all heating panels in that zone. There is no individual control for the heating panel. There are times when simultaneous heating and cooling occur. The toilet exhaust fan operates 24/7.

There is no heating coil in the AHU to preheat the air. Outside air is heated via unit heater within the AHU (see Fig. 2.4.A.9, Fig. 2.4.A.10). Existing VAV diffusers are not pressure independent and don't provide required amount of air in the spaces (see Fig. 2.4.A.11). The steam to hot water heat exchangers are at the end of their useful life (see Fig. 2.4.A.14).

The server room in the basement is served by dedicated DX Liebert units. The maintenance of these units has been sub-contracted to the outside

contractor. Basement level 1 (B1) is served by AHU-1B located on the same floor. Basement level 2 (B2) is served by AHU-2B located in the mechanical room at B2 level. AHU-3B also located at B2 level is not in service and is abandoned in place. This unit used to serve basement level 3 (B3) which is now used as storage space.

Most of the mechanical systems have VFD's on them which help with energy efficiency. Most of the mechanical equipment does not have the proper working clearance.

The elevator machine rooms are served by cooling units located in the machine room. The air distribution within the room is via supply air duct work. One unit also serves the electrical room located outside the elevator machine room (see Fig. 2.4.A.12).

The fire protection system consist of fire pumps and sprinklers on each floor. Fire command center is located at B2 level. The plumbing piping is original to the building and needs frequent repairs.

Fig. 2.4.A.9 - Room Unit Heater

Fig. 2.4.A.10 - AHU Intake within built-up AHU

Fig. 2.4.A.11 - VAV Diffuser

Fig. 2.4.A.12 - Elevator AC Unit Serving Electrical Room

Fig. 2.4.A.13 - Heating Panel

Fig. 2.4.A.14 - Steam / HW Heat Exchanger

Recommendations:

- Provide heating coil section in the AHU room to preheat the air. It will provide better heating of air and will save heating energy by eliminating heat loss to the room walls/ceiling.
- Replace existing VAV boxes/diffusers with new pressure independent VAV boxes with direct digital controls. This will improve the comfort conditions in the space and result in energy savings by delivering only the required amount of air to the spaces.
- Provide controls to perimeter heating panels and interlock the controls with VAV boxes.
- Replace heat exchangers with new heat exchangers and provide direct digital controls.
- Provide a dedicated unit for elevator machine room and electrical room. The unit serving the elevator machine room cannot serve other areas.
- Existing plumbing piping is original to building and is susceptible to frequent leaks/repairs. Replace plumbing piping in the building.
- Provide energy recovery on the toilet exhaust fan to preheat and precool outside air at the AHU. This will save heating and cooling energy.
- Upgrade the control system to incorporate energy saving control sequences such as supply air reset, static pressure reset, HW temperature reset based on outside air temperature, etc.

2.4-B CODE ISSUES

ELECTRICAL CODE ISSUES

On the first floor, a project to refinish the wall due to a water leak was completed but the data for the floor was not reinstalled. The data is hanging in front of the electrical panels and blocking the required working space (see Fig. 2.4.B.1).

There is no Ground Fault Interrupter (GFI) protection on the water fountain receptacles. Some receptacles are missing a cover (see Fig. 2.4.B.2).

The panelboard in the pump room on the first floor is missing a panel cover (see Fig. 2.4.B.3).

Some light fixture covers in office spaces are not supported properly (see Fig. 2.4.B.4).

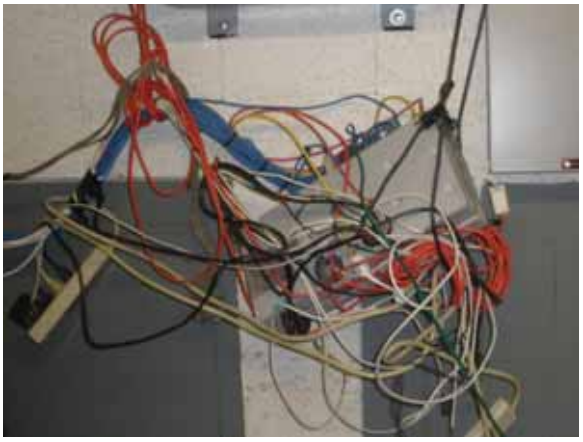

Fig. 2.4.B.1 - Data hanging in front of electrical panel

Fig. 2.4.B.2 - Receptacle missing cover

Fig. 2.4.B.3 - Missing panel cover

Fig. 2.4.B.4 - Fixture not fully supported

MECHANICAL CODE ISSUES

Recommendations:

- The elevator HVAC unit also serves the electrical room. Provide a dedicated unit for the elevator machine room.
- Verify VAV box/diffuser operation to ensure minimum ventilation is provided to the spaces they serve.
- Verify outside air quantity at the AHU.
- Provide minimum ventilation for basement B-3 storage area.
- Provide smoke/fire dampers at shaft openings.
- Provide stairwell pressurization system.

2.4-C PLANNED AND ON-GOING PROJECTS

It was reported that this building is a candidate for a fire alarm upgrade. The HVAC system and the plumbing pipes have been identified as requiring replacement. No date has been established for this work at present.

2.5 VOICE AND DATA

2.5-A OVERVIEW OF EXISTING SYSTEMS

Findings

SMW provided voice/data survey and assessment scope for this building on March 25, 2014.

Below is an assessment of the IT/Telecom Infrastructure within the Centennial Office Building:

- IT/Telecom equipment racks co-located in electrical closets, adjacent to electrical panels.
- There are many, older, abandoned telecom cables routed up the vertical building risers (core holes).
- Many of the existing telecom cables routed up the vertical building risers are unlabeled.
- Many of the conduit sleeves between vertical floors are missing fireproofing.
- The cabling to voice and data outlets is antiquated (Category 5) and will not support 1 Gigabit to the desktop or Power-Over-Ethernet (POE) devices, such as video surveillance cameras or VoIP phones.
- The existing voice cables will not support future Voice-over-IP phones.
- The Centennial building does not have a properly designed and constructed IT Infrastructure, which would include a main equipment room (i.e. an MDF), and telecommunications rooms on each floor. The building pre-dates when these building IT/Telecom standards were adopted and used in the design and construction of such infrastructures.

Recommendations:

The requirements and recommendations within this section establish the necessary Basis of Design for the IT Infrastructure portion of the renovation of the Annex building.

The building will need to be provisioned with the following pathways, spaces and cable media.

Telecommunications Rooms (i.e. Spaces)

1. Main Equipment Room (MDF) / Entrance Facility Room (EF)

- One consolidated Main Equipment Room (MDF) / Entrance Facility Room (EF) shall be installed within the building.
- This main MDF room will include both the Building Entrance Facility for supporting outside plant cabling and raceways and will be the main equipment room for installation of the low voltage and communications systems' (also referred to as the Technology systems) head end equipment.
- The MDF room shall be a minimum of 12' x 16' in size, capable of supporting the installation of one row of racks, with approximately six (6) equipment racks / cabinets.
- The MDF room shall be installed on the first floor of the building. Avoid the basement due to potential flooding.

2. Telecommunications Rooms (IDFs)

- A minimum of one (1) telecommunications room (i.e. IDF rooms) will need to be installed on each floor and should be vertically stacked, floor-to-floor. Due to the size of the building's floor plates, a 2nd IDF room may be required on each floor, vertically stacked as a 2nd riser within the building for floors 1 thru 8.
- The IDF rooms shall be a minimum of 10' x 12' in size, capable of supporting the installation of one row of four (4) equipment racks.

3. Telecommunications Room Locations

- TIA Standards require that one IDF room per floor be installed, and be located as close as possible to the center of the area being served, preferably in the core area.
- Additional IDF rooms are required per floor when the floor area served exceeds 10,000 square feet or the horizontal distribution distance to the field device or telecom outlet exceeds 295 feet (or 90 meters).
- Telecommunications rooms should not share a common wall with an electrical room due to potential electromagnetic interference (EMI) issues. If it is imperative due to constraints to place both of these

rooms adjacent, then a double wall with a 1-foot internal separation should be considered or the layout of the electrical room should preclude mounting of equipment on the common wall.

Telecommunications Pathways (i.e. Conduit/Raceways)

1. Backbone Pathways

- Telecommunications pathways will need to be installed from the MDF room to each IDF room within the building.
- Provide a minimum of three (3) 4 inch conduits from the MDF room to each IDF riser within the building.
- Provide a minimum of three (3) 4 inch conduit sleeves vertically between stacked IDF rooms.
- Provide a telecommunications pathway up to the roof of the building to support future satellite antennas.

2. Horizontal Pathways

- Telecommunications pathways will need to be installed from telecom outlets and IP field devices to the IDF room serving the floor.
- Provide wall-mounted 4" square back boxes that are 2-1/8" deep with a 1" conduit installed to the nearest portion of the cable tray for all telecommunications outlets.
- Provide cable tray on each floor within the accessible ceiling spaces of the main corridors as the primary pathways from IDF rooms to telecommunications outlets and field devices.
- Cable tray shall be ladder type aluminum tray with a 9" rung spacing and a width of 18 inches in main corridors and 12 inches in secondary cable tray segments. Cable trays shall be 4 inches in depth.

Telecommunications Cabling

1. Telecommunications Backbone Cables

- Furnish and install a 24-strand singlemode fiber cable and a 24-strand multimode fiber cable from the MDF room to each IDF room in the building. The multimode fiber cable will be OM4 50 micron laser optimized optical fiber.

- Install fiber optic cable in a 1-1/4” innerduct end to end.
- Furnish and install a 50-pair or 100-pair copper backbone cable from the MDF room to each IDF room in the building.

2. Telecommunications Horizontal Cabling

- Furnish and install a Category 6 unshielded, twisted pair (UTP) horizontal cable from telecom outlets and IP field devices to termination hardware in the IDF rooms.

3. Cabling within Single Occupancy Offices

- Provide a minimum of two telecommunications outlets, located on opposite walls, each with two data jacks. Install two Category 6 horizontal cables to each outlet from the IDF room serving the area.

4. Wireless Access Points (WAPs)

- For ceiling mounted WAPs, install two Category 6 horizontal cables to each WAP from the IDF room serving the area.
- Provide WAPs at 20 to 45 foot range or at approximately 25-foot centers on each floor, mounted in accessible ceilings.

2.5-B CODE ISSUES

Findings

It is our understanding there are currently no major code issues in the building related to the existing voice/data IT/Telecommunications Infrastructure.

- The data center has a 6 inch high raised floor.
- The cabling under the floor will restrict airflow in some areas.
- There are abandoned cables under the floor.
- The IT equipment in the facility is aging and a concern.
- The Uninterruptable Power Supply (UPS) system and the Power

Distribution Units (PDU) are aging equipment.

- There was no Telecom Grounding Bar (TGB) observed.
- The large portable cooling system has a condensate drain; which drains into a bucket that has to be monitored and then emptied when full.
- Reportedly, the grounding system does not meet the currently level of grounding as recommended in the TIA standards.
- Reportedly, the voice service comes from building at 1525 Sherman via the tunnel system.

Recommendations:

For new renovation work, codes which would be applicable would include but may not be limited to:

- International Code Council (ICC)
- National Electrical Code (NEC)
- Telecommunications Industry Association (TIA)
- Electronic Industries Alliance (EIA)
- Institute of Electrical and Electronics Engineers (IEEE)
- American National Standards Institute (ANSI)
- Underwriters Laboratories (UL)
- State/Local Governing Authorities Having Jurisdiction

2.5-C PLANNED AND ON-GOING PROJECTS

It is our understanding there are no known planned and/or on-going IT/ Telecommunications Infrastructure projects for the Centennial Office Building currently.

2.6 SECURITY SYSTEMS

2.6-A OVERVIEW OF EXISTING SYSTEMS

Findings

Note SMW was not scoped for this task for Security, no surveys.

It was reported that Hirsch access control card readers need to be upgraded. Remove DSX security system and replace with standard statewide Hirsch system.

For general security findings, see 2.1-B Code Issues: Security.

Recommendations:

The security systems design guidelines outline electronic security systems infrastructure which would enhance security operations and provide a safe and secure environment for persons and assets within the Centennial Office Building. The purpose of this recommendations report is to provide a description of electronic security system parameters which would provide a safe and secure environment for all those persons and assets within the facilities. It is intended to provide valuable information to both technical and non-technical readers for ongoing coordination with security program requirements.

The security systems should be planned and designed to allow the security personnel the operational flexibility to provide various levels of security based on the threat level at a given time. The systems must further provide capability to deliver the highest quality technology today and in the future for system expansion and change. Security system design shall employ various security technologies. Integrated security systems must be capable to function independently if required, as well as be monitored and controlled from CSP Central Command Center.

Recommended electronic security systems to be considered for implementation and/or upgrade include access control, intrusion detection, duress alarm, intercom, video surveillance, and emergency call system. These applications make it possible for security personnel to view activity both inside and outside the facilities from a central monitoring location or a network-connected security workstation at another location, so they

can provide an appropriate response. Care shall be taken to ensure that interior and exterior common circulation areas accessible to both staff and public will be properly monitored. Electronic security control and monitoring applications shall be implemented as appropriate to provide a safe and secure environment to the facility as a whole. This report is not designed as a specification, but rather as an outline to provide information on recommended security systems technology and design criteria.

The following security design methodologies, criteria and guidelines should be considered and used in development of the security program and physical/electronic security design for the Centennial Office Building:

- Industry Standard / Best Practice Design
- Crime Prevention through Environmental Design (CPTED)
- Layered Security / Concentric Circles of Protection
- Integrated Design – Physical/Electronic/Operational
- ASIS Facilities Physical Security Measures
- IESNA G-1-03 Guideline for Security Lighting
- Unified Facilities Criteria UFC 4-010-01
- State of Colorado Design Standards, as applicable

The access control system (ACS) will be an expansion of the existing campus wide system currently installed throughout other State buildings, and utilize similar ACS door controllers and peripheral equipment. New proximity type card readers shall operate with the existing proximity card credentials. Door devices are to wire through a consolidation junction box above door, and be routed to nearest IDF room where door controllers and power supplies are located. ACS door controllers installed in telecommunications IDF rooms will connect to the buildings LAN for communication with the ACS server. New security equipment to be located within IDF rooms must be coordinated with State IT technical staff. Each access controlled door should be equipped with card reader, electrified lock, door position switch, and request to-exit-motion device (or hardware integral request-to-exit switch). All doors described as a card reader controlled access door will be outfitted with the standard equipment listed, unless specifically defined elsewhere to vary from this configuration. It is recommended that for new controlled doors, magnetic locks and electronic strikes not be used. Electrified lever sets and panic hardware

should be equipped with request-to-exit switch in exit hardware. Specific door hardware requirements for each controlled door location are to be coordinated with the State. The ACS shall also serve as the primary security management system for monitoring intrusion alarms. Intrusion alarms such as door status and motion detection alarms are to be integrated with and monitored through the access control security management system. Alarm device additions and modifications shall be coordinated with State during the design phase. Security personnel shall be able to monitor security system alarm notification devices through network connected client workstations, where authorized.

The video surveillance system (VSS) will implement IP digital HD type cameras integrated with the existing VSS. Where analog head-end equipment is located, IP camera digital signals are to be decoded to analog video signal. This will allow for future migration from any older analog equipment to an IP based network video solution. IP security video shall be managed by the existing server/recorders, and new network video recorders are to be installed where required to support the addition of new cameras. It is recommended for renovation work that older technology analog camera be replaced with IP digital security camera, connected to the VSS via building LAN. Security cameras may be made up of both fixed field of view and pan-tilt-zoom (PTZ) type, and should be IP, minimum HD quality, and be Power-over-Ethernet (PoE) devices. Camera network cabling shall pull to nearest IDF room, providing connectivity to the building LAN. IP camera network cabling shall terminate to building PoE network switches. Security personnel shall be able to monitor the security video surveillance system through network connected client workstations, where authorized.

The State's existing wireless duress alarm system infrastructure should be expanded where needed to support new locations of wireless duress buttons. CSP Central Command Center monitors a wide network of wireless duress buttons at multiple, local State facilities in Denver. This is accomplished using wireless mesh coverage by use of repeaters located on the State facilities. Fixed point wireless duress buttons may be located at designated points within the Centennial Office Building, for staff use in emergency situations. The duress system will utilized wireless duress buttons, which transmit RF signals to an infrastructure of wireless RF receivers and repeaters. System repeaters will be provided where necessary to boost the strength of the wireless signals. Duress alarms in the building are to incorporate this technology, and duress alarms within the complex will be monitored by the existing CSP head-end system.

An Intercom Communication System (ICS) should be implemented to

enhance security operations in the facility, for security personnel, staff and visitors. It is strongly recommended that an Intercom over IP (IoIP) Communications solution be used for this application. And IoIP system would provide superior audio quality utilizing the latest digital technology, and provide much greater flexibility for locating both master and sub-stations anywhere on the local area network via IP communications. Security personnel in CSP CCC would be provided with two-way audio communications to any remote building IP intercom sub-station.

Within the building, new head-end security control equipment is to be located in IDF or technology rooms, as coordinated with State IT technical staff. Equipment may include ACS control panels, power supplies, duress alarm panels, network video recorders, and UPS units. All critical electronic security equipment must be backed-up with emergency power circuits or UPS units. State security personnel and other authorized staff may remotely monitor access control events, system alarms, and security video through network connected client workstations. For Centennial Office Building renovation work, requirements for security device additions/upgrades and specific security system functionality are to be coordinated with State security personnel during design and construction phases.

The security systems described above are generally controlled and monitored centrally, primarily from Colorado State Patrol's Central Command Center (CCC), located in Denver CO. The above listed security applications must be evaluated during renovation project schematic design phases to confirm applicability to the most current State electronic security systems standards. For any renovation work, security contractors should be pre-qualified prior to bidding, and will be required to work very closely with State security personnel during installation, commissioning and testing phases. All security installation work, construction standards, and operation requirements are to be closely coordinated with the State by the electronic security integrator.

Electronic security systems provided for the Centennial Office Building shall be an extension of existing State facility security system infrastructure, as described earlier in the report. It is generally recommended that the building be provided with electronic security applications and equipment as listed below:

Access controlled doors:

- Main entry
- Suite entries on each floor

- IDF rooms, recommended
- Sensitive spaces

Intrusion alarms:

- Access controlled doors
- Emergency egress only doors
- Perimeter doors

Intercom stations:

- Main entry, recommended
- Receiving dock door, recommended

Wireless duress alarms:

- Public interface counters
- Cash handling locations
- Loading docks

Video surveillance cameras:

- Perimeter entry/exit doors
- Entry lobby/reception
- Elevator lobbies
- Emergency exit doors
- Loading docks
- Building exteriors

Security system cabling should generally share cable routes with that of the building structured network cabling system. The network cabling paths and riser locations generally provides the most direct route through a facility, and typically contain sufficient space for security cabling requirements. Data

cabling required for IP security cameras should be provided and installed by the Telecommunications Contractor. This is the recommended design and construction method for provisioning of the IP camera network cabling to support the VSS cabling infrastructure. State IT construction standards for network and security cabling types and jacket color must be adhered to. Security cabling should never be exposed and should be contained in protective conduit wherever cable is accessible to vandalism, accidental damage, or where it traverses any unsecured space. Security cabling shall be plenum rated where required by codes.

The security conduit pathway system should be coordinated with the electrical distribution system in order to maintain separation from motors or transformers, separation between parallel runs of telecommunications and electrical cabling, and separation from fluorescent lights.

Basic Security Conduit requirements:

- All security cabling located in in-accessible spaces shall be installed in conduit.
- All exposed security system cabling and shall be installed in conduit.
- All security system conduits shall be minimum ¾" unless otherwise required.
- All penetrations of rated walls shall be fire-stopped in an approved manner to prevent the passage of flame, smoke, and gas.

Head-end security control equipment shall generally be located in Intermediate Distribution Frame (IDF) rooms, or other technology rooms. Security equipment locations within IDF rooms must be coordinated with State IT technical staff during design phase. This equipment may include access control panels, wireless duress equipment, power supplies, network video recorders, and UPS units. Specific requirements and locations within the rooms will be determined during the design phase. Security cabling within IDF rooms shall be piped to wire gutters and or security equipment panels. Within IDF rooms, it is anticipated a 4'x8' section of wall space shall be reserved for security equipment, and supplied with fire treated plywood backboard. All security equipment in the room should be located away from potential sources of electro-mechanical interference (EMI) and water infiltration. Rack mounted security equipment may share space in telecommunication equipment racks, where appropriate, and as coordinated State IT personnel. One dedicated 120VAC 20A power circuit shall generally be required at each security wall board location and at each

security equipment rack. In the event of loss of building power, all mission critical electronic security equipment requiring continuous 120VAC power shall be provided with back-up UPS units. All UPS units shall be stand-alone units dedicated for security, and shall be sized accordingly based on required run time.

2.6-B CODE ISSUES

Findings

It is our understanding there are currently no code issues in the building related to existing electronic security systems.

Recommendations:

For new renovation work, codes which would be applicable would include but may not be limited to:

- International Code Council (ICC)
- Americans with Disabilities Act (ADA)
- National Fire Alarm and Signaling Code (NFPA 72)
- National Fire Protection Association Life Safety Code (NFPA 101)
- National Electrical Code (NEC)
- Telecommunications Industry Association (TIA)
- Electronic Industries Alliance (EIA)
- American National Standards Institute (ANSI)
- Underwriters Laboratories (UL)
- City of Denver Access Control Code
- State/Local Governing Authorities Having Jurisdiction

2.6-C PLANNED AND ON-GOING PROJECTS

It is our understanding there are no known planned and/or on-going Security System projects for the Centennial Office Building currently.

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3.0 FLOOR-BY-FLOOR ASSESSMENT FINDINGS AND RECOMENDATIONS

General Architecture Findings

With the exception of the two sub-basement levels, 2B and 3B, each floor in the Centennial Building consists of a repeating layout at the core of the building with a central circulation corridor running in an east-west direction with stairwells, restrooms, and service closets located at either end and elevators located on the north and south sides of the middle section of the corridor. The areas outside of the core service corridor typically consist of a combination of open office space and enclosed private office spaces and conference rooms, the latter of which are typically located along the exterior walls of the building.

The elevator lobbies from the First Floor to the Eighth Floor, located in the middle of the core circulation corridor, have terrazzo flooring, wood laminate panels cladding the walls, and a dropped 2x4 acoustic ceiling. The east and west ends of the central circulation corridors, with the stairwells, restrooms, and service closets, have carpet flooring, gypsum board walls, and a slightly lower dropped 2x4 acoustic ceiling. The flooring in the restrooms is one-inch square tile and the walls are clad in three-inch square tile. The office spaces which were included in the site survey generally had carpet flooring, gypsum board and movable walls, and 2x4 acoustic ceiling tile. There is a Walkerduct electrified floor system throughout the building office spaces with tombstone floor boxes. The seams between the floor box trenches and the carpet has been taped in some locations (see Fig.3.0.1). This system is out of date and creates a tripping hazard.

Fig. 3.0.1 Walkerduct Electrified Floor System: typical tombstone floor box covers found throughout the building.

Per the Hazard Material Reports supplied by the Owner, asbestos is present in the building but not to such an extent that phasing of the construction would be eliminated as a possibility. It was reported that there is asbestos present in the mastic of the vinyl composition floor tiles that exist in the building. All asbestos within the building should be abated and all personnel should be removed from affected areas during construction.

3.1 FIRST FLOOR

The main building entrance exists on the east side of this floor, exiting to Sherman Street.

3.1-A CODE ISSUES

See 2.1-B Code Issues.

3.1-B GENERAL ACCESSIBILITY ISSUES

See 2.1-C General Accessibility Issues.

3.1-C ARCHITECTURAL FINISHES AND INTERIOR COMPONENTS

Ceiling Finishes

In general, the ceilings throughout the First Floor appeared to be higher than the other floors. The 2x4 acoustic ceiling tiles in the core circulation corridor are in generally fair condition, however, damage was noted on the east side.

The offices that were included in the site survey visit also had 2x4 acoustic ceiling tiles in generally fair condition.

Wall Finishes

The core circulation corridor has a mix of areas with wood laminate panels cladding the walls in generally fair condition and with gypsum board walls in generally fair condition. The three-inch square wall tile in the restrooms is in generally fair condition throughout the building. The offices that were included in the site survey visit were found to have a mix of areas with gypsum board walls in generally fair condition and with movable walls in generally fair condition.

Floor Finishes

The terrazzo flooring in the elevator lobby of the core circulation corridor is in generally fair condition. The one-inch square floor tile in the restrooms is dirty in some locations but is otherwise in generally fair condition throughout the building (see Fig.3.1.C.1 and Fig.3.1.C.2). The office spaces that were included in the site survey visit were found to have carpet in generally fair condition.

Fig. 3.1.C.1 Tile flooring in restrooms found to be dirty in some locations throughout the building.

Fig. 3.1.C.2 Tile flooring in restrooms found to be dirty in some locations throughout the building.

Recommendations:

- Per the Hazard Material Reports supplied by the Owner, asbestos is present in the building. All personnel should be removed from the affected areas during construction and all existing asbestos should be abated as part of the renovation.
- Demo each floor to the core shell. Complete renovation of these spaces, including the restrooms.

MARTIN / MARTIN CONSULTING ENGINEERS

3.1-D STRUCTURAL

See section 2.2 for structural observations and recommendations for all floors.

3.1-E VOICE AND DATA

Refer to Section 2.5-A for IT/Telecom Infrastructure general recommendations, as applicable to each floor.

3.1-F SECURITY SYSTEMS

Refer to Section 2.6-A for Security System general recommendations, as applicable to each floor.

3.2 SECOND FLOOR

3.2-A CODE ISSUES

See 2.1-B Code Issues.

3.2-B GENERAL ACCESSIBILITY ISSUES

See 2.1-C General Accessibility Issues.

3.2-C ARCHITECTURAL FINISHES AND INTERIOR COMPONENTS

Ceiling Finishes

The 2x4 acoustic ceiling tiles throughout the floor are in generally poor condition with deterioration and sagging due to aging and with soiling around the return air locations.

Wall Finishes

The core circulation corridor has a mix of areas with wood laminate panels cladding the walls in generally fair condition and with gypsum board walls in generally fair condition. The three-inch square wall tile in the restrooms is in generally fair condition throughout the building. The offices that were included in the site survey visit were found to have a mix of areas with gypsum board walls in generally fair condition and with movable walls in generally fair condition.

Floor Finishes

The terrazzo flooring in the elevator lobby of the core circulation corridor is in generally fair condition. The one-inch square floor tile in the restrooms is dirty in some locations but is otherwise in generally fair condition throughout the building. The office spaces that were included in the site survey visit were found to have areas of carpet in generally fair condition as well as large areas of carpet in generally poor condition with signs of deterioration due to aging and numerous stained and dirty areas (see Fig. 3.2.C.1).

Fig. 3.2.C.1 Typical stained, dirty, and generally deteriorated carpet.

Recommendations:

- Per the Hazard Material Reports supplied by the Owner, asbestos is present in the building. All personnel should be removed from the affected areas during construction and all existing asbestos should be abated as part of the renovation.
- Demo each floor to the core shell. Complete renovation of these spaces, including the restrooms.

3.2-D STRUCTURAL

See section 2.2 for structural observations and recommendations for all floors.

3.2-E VOICE AND DATA

Refer to Section 2.5-A for IT/Telecom Infrastructure general recommendations, as applicable to each floor.

3.2-F SECURITY SYSTEMS

Refer to Section 2.6-A for Security System general recommendations, as applicable to each floor.

3.3 THIRD FLOOR

3.3-A CODE ISSUES

See 2.1-B Code Issues.

3.3-B GENERAL ACCESSIBILITY ISSUES

See 2.1-C General Accessibility Issues.

3.3-C ARCHITECTURAL FINISHES AND INTERIOR COMPONENTS

Ceiling Finishes

The 2x4 acoustic ceiling tiles throughout the floor are in generally poor condition with deterioration and sagging due to aging and with soiling around the return air locations (see Fig.3.3.C.1).

Wall Finishes

The core circulation corridor has a mix of areas with wood laminate panels cladding the walls in generally fair condition and with gypsum board walls in generally fair condition. The three-inch square wall tile in the restrooms is in generally fair condition throughout the building. The offices that were included in the site survey visit were found to have a mix of areas with gypsum board walls in generally fair condition and with movable walls in generally fair condition.

Floor Finishes

The terrazzo flooring in the elevator lobby of the core circulation corridor is in generally fair condition. The one-inch square floor tile in the restrooms is

dirty in some locations but is otherwise in generally fair condition throughout the building. The office spaces that were included in the site survey visit were found to have areas of carpet in generally fair condition as well as large areas of carpet in generally poor condition with signs of deterioration due to aging and numerous stained and dirty areas.

Fig. 3.3.C.1 Damaged 2x4 acoustic ceiling tile at Office 319.

Recommendations:

- Per the Hazard Material Reports supplied by the Owner, asbestos is present in the building. All personnel should be removed from the affected areas during construction and all existing asbestos should be abated as part of the renovation.
- Demo each floor to the core shell. Complete renovation of these spaces, including the restrooms.

3.3-D STRUCTURAL

See section 2.2 for structural observations and recommendations for all floors.

3.3-E VOICE AND DATA

Refer to Section 2.5-A for IT/Telecom Infrastructure general recommendations, as applicable to each floor.

3.3-F SECURITY SYSTEMS

Refer to Section 2.6-A for Security System general recommendations, as applicable to each floor.

3.4 FOURTH FLOOR

3.4-A CODE ISSUES

See 2.1-B Code Issues.

3.4-B GENERAL ACCESSIBILITY ISSUES

See 2.1-C General Accessibility Issues.

3.4-C ARCHITECTURAL FINISHES AND INTERIOR COMPONENTS

Ceiling Finishes

The 2x4 acoustic ceiling tiles throughout the floor are in generally poor condition with deterioration and sagging due to aging and with soiling around the return air locations (see Fig. 3.4.C.1).

Wall Finishes

The core circulation corridor has a mix of areas with wood laminate panels cladding the walls in generally fair condition and with gypsum board walls in generally fair condition. The three-inch square wall tile in the restrooms is in generally fair condition throughout the building. The offices that were included in the site survey visit were found to have a mix of areas with gypsum board walls in generally fair condition and with movable walls in generally fair condition.

Floor Finishes

The terrazzo flooring in the elevator lobby of the core circulation corridor is in generally fair condition. The one-inch square floor tile in the restrooms is dirty in some locations but is otherwise in generally fair condition throughout the building. The office spaces that were included in the site survey visit were found to have areas of carpet in generally poor condition with signs of deterioration due to aging and numerous stained and dirty areas.

Fig. 3.4.C.1 2x4 acoustic ceiling tiles in generally poor condition.

Recommendations:

- Per the Hazard Material Reports supplied by the Owner, asbestos is present in the building. All personnel should be removed from the affected areas during construction and all existing asbestos should be abated as part of the renovation.
- Demo each floor to the core shell. Complete renovation of these spaces, including the restrooms.

3.4-D STRUCTURAL

See section 2.2 for structural observations and recommendations for all floors.

3.4-E VOICE AND DATA

Refer to Section 2.5-A for IT/Telecom Infrastructure general recommendations, as applicable to each floor.

3.4-F SECURITY SYSTEMS

Refer to Section 2.6-A for Security System general recommendations, as applicable to each floor.

3.5 FIFTH FLOOR

3.5-A CODE ISSUES

See 2.1-B Code Issues.

3.5-B GENERAL ACCESSIBILITY ISSUES

See 2.1-C General Accessibility Issues.

3.5-C ARCHITECTURAL FINISHES AND INTERIOR COMPONENTS

Ceiling Finishes

The 2x4 acoustic ceiling tiles throughout the floor are in generally poor condition with deterioration and sagging due to aging and with soiling around the return air locations.

Wall Finishes

The core circulation corridor has a mix of areas with wood laminate panels cladding the walls in generally fair condition and with gypsum board walls in generally fair condition. The three-inch square wall tile in the restrooms is in generally fair condition throughout the building. The offices that were included in the site survey visit were found to have a mix of areas with gypsum board walls in generally fair condition and with movable walls in generally fair condition.

Floor Finishes

The terrazzo flooring in the elevator lobby of the core circulation corridor is in generally fair condition. The one-inch square floor tile in the restrooms is dirty in some locations but is otherwise in generally fair condition throughout

the building. The office spaces that were included in the site survey visit were found to have areas of carpet in generally poor condition with signs of deterioration due to aging and numerous stained and dirty areas.

Recommendations:

- Per the Hazard Material Reports supplied by the Owner, asbestos is present in the building. All personnel should be removed from the affected areas during construction and all existing asbestos should be abated as part of the renovation.
- Demo each floor to the core shell. Complete renovation of these spaces, including the restrooms.

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3.5-D STRUCTURAL

See section 2.2 for structural observations and recommendations for all floors.

SM&W SHEN MILSOM WILKE

3.5-E VOICE AND DATA

Refer to Section 2.5-A for IT/Telecom Infrastructure general recommendations, as applicable to each floor.

SM&W SHEN MILSOM WILKE

3.5-F SECURITY SYSTEMS

Refer to Section 2.6-A for Security System general recommendations, as applicable to each floor.

3.6 SIXTH FLOOR

3.6-A CODE ISSUES

See 2.1-B Code Issues.

3.6-B GENERAL ACCESSIBILITY ISSUES

See 2.1-C General Accessibility Issues.

3.6-C ARCHITECTURAL FINISHES AND INTERIOR COMPONENTS

Ceiling Finishes

The 2x4 acoustic ceiling tiles throughout the floor are in generally poor condition with deterioration and sagging due to aging and with soiling around the return air locations.

Wall Finishes

The core circulation corridor has a mix of areas with wood laminate panels cladding the walls in generally fair condition and with gypsum board walls in generally fair condition. The three-inch square wall tile in the restrooms is in generally fair condition throughout the building. The offices that were included in the site survey visit were found to have a mix of areas with gypsum board walls in generally fair condition and with movable walls in generally fair condition.

Floor Finishes

The terrazzo flooring in the elevator lobby of the core circulation corridor is in generally fair condition. The one-inch square floor tile in the restrooms is dirty in some locations but is otherwise in generally fair condition throughout the building. The office spaces that were included in the site survey visit

were found to have areas of carpet in generally poor condition with signs of deterioration due to aging and numerous stained and dirty areas.

Recommendations:

- Per the Hazard Material Reports supplied by the Owner, asbestos is present in the building. All personnel should be removed from the affected areas during construction and all existing asbestos should be abated as part of the renovation.
- Demo each floor to the core shell. Complete renovation of these spaces, including the restrooms.

MARTIN / MARTIN CONSULTING ENGINEERS

3.6-D STRUCTURAL

See section 2.2 for structural observations and recommendations for all floors.

SM&W SHEN MILSOM WILKE

3.6-E VOICE AND DATA

Refer to Section 2.5-A for IT/Telecom Infrastructure general recommendations, as applicable to each floor.

SM&W SHEN MILSOM WILKE

3.6-F SECURITY SYSTEMS

Refer to Section 2.6-A for Security System general recommendations, as applicable to each floor.

3.7 SEVENTH FLOOR

3.7-A CODE ISSUES

See 2.1-B Code Issues.

3.7-B GENERAL ACCESSIBILITY ISSUES

See 2.1-C General Accessibility Issues.

3.7-C ARCHITECTURAL FINISHES AND INTERIOR COMPONENTS

Ceiling Finishes

The 2x4 acoustic ceiling tiles throughout the floor are in generally poor condition with deterioration and sagging due to aging and with soiling around the return air locations.

Wall Finishes

The core circulation corridor has a mix of areas with wood laminate panels cladding the walls in generally fair condition and with gypsum board walls in generally fair condition. The three-inch square wall tile in the restrooms is in generally fair condition throughout the building. The offices that were included in the site survey visit were found to have a mix of areas with gypsum board walls in generally fair condition and with movable walls in generally fair condition.

Floor Finishes

The terrazzo flooring in the elevator lobby of the core circulation corridor is in generally fair condition. The one-inch square floor tile in the restrooms is dirty in some locations but is otherwise in generally fair condition throughout

the building. The office spaces that were included in the site survey visit were found to have areas of carpet in generally poor condition with signs of deterioration due to aging and numerous stained and dirty areas.

Recommendations:

- Per the Hazard Material Reports supplied by the Owner, asbestos is present in the building. All personnel should be removed from the affected areas during construction and all existing asbestos should be abated as part of the renovation.
- Demo each floor to the core shell. Complete renovation of these spaces, including the restrooms.

MARTIN / MARTIN CONSULTING ENGINEERS

3.7-D STRUCTURAL

See section 2.2 for structural observations and recommendations for all floors.

SM&W SHEN MILSOM WILKE

3.7-E VOICE AND DATA

Refer to Section 2.5-A for IT/Telecom Infrastructure general recommendations, as applicable to each floor.

SM&W SHEN MILSOM WILKE

3.7-F SECURITY SYSTEMS

Refer to Section 2.6-A for Security System general recommendations, as applicable to each floor.

3.8 EIGHTH FLOOR

3.8-A CODE ISSUES

See 2.1-B Code Issues.

3.8-B GENERAL ACCESSIBILITY ISSUES

See 2.1-C General Accessibility Issues.

3.8-C ARCHITECTURAL FINISHES AND INTERIOR COMPONENTS

Ceiling Finishes

The 2x4 acoustic ceiling tiles throughout the floor are in generally poor condition with deterioration and sagging due to aging and with soiling around the return air locations.

Wall Finishes

The core circulation corridor has a mix of areas with wood laminate panels cladding the walls in generally fair condition and with gypsum board walls in generally fair condition. The three-inch square wall tile in the restrooms is in generally fair condition throughout the building. The offices that were included in the site survey visit were found to have a mix of areas with gypsum board walls in generally fair condition and with movable walls in generally fair condition.

Floor Finishes

The terrazzo flooring in the elevator lobby of the core circulation corridor is in generally fair condition. The one-inch square floor tile in the restrooms is dirty in some locations but is otherwise in generally fair condition throughout

the building. The office spaces that were included in the site survey visit were found to have areas of carpet in generally fair condition as well as large areas of carpet in generally poor condition with signs of deterioration due to aging and numerous stained and dirty areas.

Recommendations:

- Per the Hazard Material Reports supplied by the Owner, asbestos is present in the building. All personnel should be removed from the affected areas during construction and all existing asbestos should be abated as part of the renovation.
- Demo each floor to the core shell. Complete renovation of these spaces, including the restrooms.

3.8-D STRUCTURAL

See section 2.2 for structural observations and recommendations for all floors.

3.8-E VOICE AND DATA

Refer to Section 2.5-A for IT/Telecom Infrastructure general recommendations, as applicable to each floor.

3.8-F SECURITY SYSTEMS

Refer to Section 2.6-A for Security System general recommendations, as applicable to each floor.

3.9 1B (BASEMENT)

This floor exits to a terraced garden area with seating and tables on the north side of the building. This floor includes the Cafeteria and houses the Division of State Archives and Public Records.

The Division of State Archives and Public Records storage areas.

3.9-A CODE ISSUES

See 2.1-B Code Issues.

3.9-B GENERAL ACCESSIBILITY ISSUES

See 2.1-C General Accessibility Issues.

3.9-C ARCHITECTURAL FINISHES AND INTERIOR COMPONENTS

Ceiling Finishes

The 2x4 acoustic ceiling tiles in the Cafeteria are in generally fair condition.

The 2x4 acoustic ceiling tiles in the majority of the corridors are in generally poor condition with deterioration and sagging due to aging and with soiling around the return air locations.

Wall Finishes

The core circulation corridor has a mix of areas with wood laminate panels cladding the walls in generally fair condition and with gypsum board walls in generally fair condition. The three-inch square wall tile in the restrooms is in generally fair condition throughout the building. The areas that were included in the site survey visit were found to have a mix of areas with gypsum board walls in generally fair condition, with movable walls in generally fair condition, and with CMU block walls in generally fair condition.

Floor Finishes

The terrazzo flooring in the elevator lobby and North Entrance Lobby is in generally fair condition, with the exception of a crack spanning the width of the entrance lobby. The one-inch square floor tile in the restrooms is dirty in some locations but is otherwise in generally fair condition throughout the building. The areas that were included in the site survey visit were found to have areas of twelve-inch square linoleum tiles in generally fair condition. Vinyl base molding around the perimeter of the corridor serving the LOA and DNR areas is in poor condition with multiple areas cracking and peeling away from the wall (see Fig.3.9.C.1). The carpet in the office areas that were included in the site survey visit is in generally fair condition.

Fig. 3.9.C.1 Vinyl base molding cracking and peeling away from the wall.

Recommendations:

- Per the Hazard Material Reports supplied by the Owner, asbestos is present in the building. All personnel should be removed from the affected areas during construction and all existing asbestos should be abated as part of the renovation.
- Demo each floor to the core shell. Complete renovation of these spaces, including the restrooms.
- Consider moving the records and other materials that are part of the Division of State Archives and Public Records to a space or facility that will provide an environment that will both protect and preserve the documents for future generations.

3.9-D STRUCTURAL

See section 2.2 for structural observations and recommendations for all floors.

3.9-E VOICE AND DATA

Refer to Section 2.5-A for IT/Telecom Infrastructure general recommendations, as applicable to each floor.

3.9-F SECURITY SYSTEMS

Refer to Section 2.6-A for Security System general recommendations, as applicable to each floor.

3.10 2B (SUB-BASEMENT)

This floor exits to Lincoln Street on the west side of the building. This floor includes a loading dock off of Lincoln Street and areas of storage for the Division of State Archives and Public Records.

The Division of State Archives and Public Records storage areas.

3.10-A CODE ISSUES

See 2.1-B Code Issues.

3.10-B GENERAL ACCESSIBILITY ISSUES

See 2.1-C General Accessibility Issues.

3.10-C ARCHITECTURAL FINISHES AND INTERIOR COMPONENTS

Ceiling Finishes

The 2x4 acoustic ceiling tiles in the main corridors are in generally poor

condition. The open ceiling in the storage areas is in generally good condition. The exposed metal decking at the ceiling is not fireproofed (see Fig. 3.10.C.1).

Wall Finishes

The core circulation corridor has brick walls in generally fair condition. The three-inch square wall tile in the restrooms is in generally fair condition throughout the building. The other areas that were included in the site survey visit have CMU block walls in generally fair condition.

Floor Finishes

The core circulation corridor has twelve-inch square linoleum tile flooring in generally fair condition. The vinyl base molding around the perimeter of the corridor is in generally poor condition with many areas of deteriorating and missing vinyl noted. The one-inch square floor tile in the restrooms is dirty in some locations but is otherwise in generally fair condition throughout the building. The other areas that were included in the site survey visit have concrete floors that are in generally fair condition with minor cracking noted.

Fig. 3.10.C.1 The Division of State Archives and Public Records storage areas. Exposed metal decking at the ceiling with no fireproofing.

Recommendations:

- Per the Hazard Material Reports supplied by the Owner, asbestos is present in the building. All personnel should be removed from the affected areas during construction and all existing asbestos should be abated as part of the renovation.
- Demo each floor to the core shell. Complete renovation of these spaces, including the restrooms.
- Consider moving the records and other materials that are part of the Division of State Archives and Public Records to a space or facility that will provide an environment that will both protect and preserve the documents for future generations.

3.10-D STRUCTURAL

See section 2.2 for structural observations and recommendations for all floors.

3.10-E VOICE AND DATA

Refer to Section 2.5-A for IT/Telecom Infrastructure general recommendations, as applicable to each floor.

3.10-F SECURITY SYSTEMS

Refer to Section 2.6-A for Security System general recommendations, as applicable to each floor.

3.11 3B (SUB-BASEMENT)

This floor includes areas of storage for the Division of State Archives and Public Records. The site survey did not include storage areas that were fenced off and locked.

3.11-A CODE ISSUES

See 2.1-B Code Issues.

3.11-B GENERAL ACCESSIBILITY ISSUES

See 2.1-C General Accessibility Issues.

3.11-C ARCHITECTURAL FINISHES AND INTERIOR COMPONENTS

Ceiling Finishes

The ceiling is open and is in generally fair condition. Cracking was noted on the west side under the loading dock area on the floor above (2B Floor).

Wall Finishes

The areas that were included in the site survey visit have painted CMU block walls in generally fair condition.

Floor Finishes

The one-inch square floor tile in the restrooms is dirty in some locations but is otherwise in generally fair condition throughout the building. The areas that were included in the site survey visit have concrete floors that are in generally fair condition.

Recommendations:

- Per the Hazard Material Reports supplied by the Owner, asbestos is present in the building. All personnel should be removed from the affected areas during construction and all existing asbestos should be abated as part of the renovation.
- Demo each floor to the core shell. Complete renovation of these spaces, including the restrooms.
- Consider moving the records and other materials that are part of the Division of State Archives and Public Records to a space or facility that will provide an environment that will both protect and preserve the documents for future generations.

3.11-D STRUCTURAL

See section 2.2 for structural observations and recommendations for all floors.

3.11-E VOICE AND DATA

Refer to Section 2.5-A for IT/Telecom Infrastructure general recommendations, as applicable to each floor.

3.11-F SECURITY SYSTEMS

Refer to Section 2.6-A for Security System general recommendations, as applicable to each floor.

4.0 LEVELS OF RENOVATION NEEDED

Building: Centennial Building, 1313 Sherman Street (Denver)

Priority	Main System	Sub System	Level of Renovation Needed		
			Minimal	Moderate	Extensive
1	Exterior Enclosure	Windows			√
1	Exterior Enclosure	Roof			√
1	Exterior Enclosure	Fall Protection (roof)			√
1	Exterior Enclosure	Sealant/Grout			√
1	Infrastructure	HVAC			√
1	Infrastructure	Security Video			√
1	Infrastructure	Power			√
1	Infrastructure	Lighting			√
1	Infrastructure	Plumbing			√
1	Infrastructure	Tele/Com			√
1	Infrastructure	Fire Alarm			√
1	Infrastructure	Fire Sprinkler			√
1	Interior	Finishes - Flooring			√
1	Interior	Finishes Ceiling			√
1	Interior	Finishes - Wall			√
1	Interior	ADA-Drinking Fountains			√
1	Interior	Doors			√
2	Code	Exit Stairways		√	
2	Exterior Enclosure	Penthouse		√	
2	Exterior Enclosure	Walls		√	
2	Infrastructure	Security Access/IDS		√	
2	Interior	ADA-Door Levers		√	
2	Site	Drainage		√	
2	Site	Pavement		√	
3	Exterior Enclosure	Doors	√		
3	Infrastructure	Structural Framing	√		
3	Interior	ADA-Restrooms	√		
	Environmental	Asbestos	(present, per Owner)		
	Code	Exits			
	Code	Dead End Corridors			
	Exterior Enclosure	Signage			
	Infrastructure	Elevator(s)			
	Interior	ADA-Sinks (Break Rooms)			
	Site	Utilities			
	Site	Lighting			

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5.0 COST ESTIMATES

SUMMARY OF SUMMARIES

Item No.	Description	SF	Total	$/SF
1	Centennial Building - 1313 Sherman St. Renovation	205,315	29,950,358	145.88
2	Contingency on Above		w/ Above	
	Subtotals:	**205,315**	**29,950,358**	**146**
3b	IT \ Teledata	205,315	1,380,767	6.73
3e	Public Art	205,315	346,667	1.69
4	Contingency on Above		Excluded	
	Equipment \ Art Subtotal:		**1,727,434**	**8.41**
	Base Price \ Equipment \ Art Subtotal:		**31,677,792**	**154**
5	Escalation - 6.75% per year		Excluded	
6	Contingency on Above		Excluded	
	Escalation Subtotal:		**Excluded**	
	Base Price \ Equipment \ Art Subtotal:		**31,677,792**	**154**
5	Design Fees at 8% per State of CO Direction		2,534,223	12.34
6	Contingency on Above		Excluded	
	Design Fee Subtotal:		**2,534,223**	**12.34**
	Base Price \ Equipment \ Art \ Design Fee Subtotal:		**34,212,015**	**167**

PROJECTED COST OF CONSTRUCTION IN 2014 DOLLARS	**34,212,015**	**167**

ADD ALTERNATE				
12	Move Management	205,315	585,560	2.85
13	Flex Space	186,837	4,973,932	26.62
14	FF&E (FF&E SF & $25\SF Allowance per Architect)	158,411	3,960,275	25.00
15	Escalation		Excluded	
16	Contingency on Above		Excluded	
	Move Management Subtotal:		**9,519,766**	
	Add Alternate Subtotal:		**9,519,933**	**46**

SYSTEM BY SYSTEM SUMMARY

Item No.	Description	SF	Total	$/SF
1A	Total Gut & Renovation to Core Shell*	205,315	11,251,264	54.80
	Includes fire suppression; MEP excluded (w/Below)			
1B	Escalation		Excluded	
System 1 Renovation Subtotal:			**11,251,264**	**55**
2A	Replace Fire Alarm	205,315	291,541	1.42
2B	Escalation		Excluded	
System 2 Replace Fire Alarm Subtotal:			**291,541**	**1**
3A	Replace HVAC, Add Stair Pressurization	205,315	9,839,947	47.93
3B	Escalation		Excluded	
System 3 HVAC Replacement Subtotal:			**9,839,947**	**48**
4A	Replace Roof	205,315	301,539	1.47
4B	Escalation		Excluded	
System 4 Roof Replacement Subtotal:			**301,539**	**1**
5A	Replace All Plumbing Piping	205,315	2,722,582	13.26
5B	Escalation		Excluded	
System 5 Replace Piping Subtotal:			**2,722,582**	**13**
6A	Balance of Scope	205,315	5,793,485	28.22
6B	Escalation		Excluded	
System 6 w/o Escalation Subtotal:			**5,793,485**	**28**
System by System Total Project 2014 Dollars Subtotal:			**30,200,358**	**147**
7	IT \ Teledata (Relocate Exstg Only)		1,380,767	6.73
8	Public Art		346,667	1.69
9	Contingency on Above		Excluded	
Equipment \ Art Subtotal:			**1,727,434**	**8**
Systems \ Equipment \ Art Subtotal:			**31,927,792**	**156**
10	Design Fees at 8% per State of CO Direction		2,554,223	12.44
11	Contingency on Above		Excluded	
Design Fee Subtotal:			**2,554,223**	**12.44**
Base Price \ Equipment \ Art \ Design Fee Subtotal:			**34,482,015**	**168**

PROJECTED COST OF CONSTRUCTION IN 2014 DOLLARS	**34,482,015**	**168**

ADD ALTERNATE				
12	Move Management	205,315	585,560	2.85
13	Flex Space	186,837	4,973,932	26.62
14	FF&E (FF&E SF & $25\SF Allowance per Architect)	158,411	3,960,275	25.00
15	Escalation		Excluded	
16	Contingency on Above		Excluded	
	Move Management Subtotal:		**9,519,766**	
	Add Alternate Subtotal:		**9,519,766**	**46**

FF&E DETAILED ESTIMATE - BASE

Estimate By:	Kyle Hoiland
Date:	10-Mar-14
Reviewed By:	Chris Squadra
Date:	10-Mar-14
Total Cost:	$11,247,200

	Description	Quantity	Unit	TOTALS Cost/Unit	TOTALS Total Cost
	FF&E				
	Employee Workstations (1 employee:250 sf) Minor Repair to Existing Only	158,411	SF	25.00	3,960,275
	Small Conference Rooms (1 small room:2,500 sf)				w/Above
	Large Conference Rooms				w/Above
	SUBTOTAL FF&E				**3,960,275**

	Description	Quantity	Unit	TOTALS Cost/Unit	TOTALS Total Cost
	IT\Teledata				
	AV / IT @ Large Conference Rooms	8	EA	6,053.57	48,429
	VOIP Telephone System	862	EA	324.09	279,472
	PC Workstations	838	EA	937.55	785,373
	CAT 6E Data Cabling	862	EA	310.20	267,494
	State of CO Servers, Routers, Wireless Access and IT Equipment not listed above				Excluded
	SUBTOTAL IT\TELEDATA				**1,380,767**

	Description	Quantity	Unit	TOTALS Cost/Unit	TOTALS Total Cost
	Move Management				
	Moving Labor, Material, Equipment & Supervision (2 Moves)	1,643	EA	281.27	461,984
	Relocate PC Workstations (2 Moves)	1,643	EA	75.24	123,576
	SUBTOTAL MOVE MANAGEMENT				**585,560**

	Description	Quantity	Unit	TOTALS Cost/Unit	TOTALS Total Cost
	Flex Space				
	Flex Space for Multiple Moves and\or Tenant Holdover (per floor)	186,837	RSF	26.62	4,973,932
	SUBTOTAL MOVE LEASED SPACE				**4,973,932**

	Description	Quantity	Unit	TOTALS Cost/Unit	TOTALS Total Cost
	Public Art				
	Art in Public Spaces Allowance at 1.0% of Construction Cost	1	LS	346,666.54	346,667
	SUBTOTAL PUBLIC ART				**346,667**

TOTAL COST -					**11,247,200**
					55

DETAILED ESTIMATE - SUMMARY

				205,315
Item No.	**Description**	**$/SF**	**Total**	**Total w/Burdens**
DIV 2	EXISTING CONDITIONS	6.93	1,422,098	2,128,526
DIV 3	CONCRETE	1.66	341,758	511,526
DIV 4	STONE & MASONRY	0.01	2,500	3,742
DIV 5	METALS	0.35	71,792	107,455
DIV 6	WOODS & PLASTICS	1.46	299,745	448,643
DIV 7	THERMAL PROTECTION	3.11	639,284	956,848
DIV 8	OPENINGS, DOORS, WINDOWS	4.64	952,175	1,425,169
DIV 9	FINISHES	14.12	2,898,191	4,337,868
DIV 10	SPECIALITIES	0.13	27,684	41,436
DIV 11	EQUIPMENT		EXCLUDED	
DIV 12	FURNISHINGS	0.15	29,832	44,651
DIV 13	SPECIAL CONSTRUCTION		EXCLUDED	
DIV 14	CONVEYING SYSTEMS	0.00	750	1,123
DIV 21	FIRE SUPPRESSION	10.62	2,180,445	3,263,582
DIV 22	PLUMBING	10.85	2,227,148	3,333,485
DIV 23	HVAC	28.10	5,769,352	8,635,278
DIV 26	ELECTRICAL	13.71	2,814,869	4,213,155
DIV 27	COMMUNICATIONS	1.55	318,238	476,323
DIV 31	EARTHWORK		EXCLUDED	
DIV 32	EXTERIOR IMPROVEMENTS	0.07	14,396	21,547
DIV 33	UTILITIES		EXCLUDED	
DIV 34	TRANSPORTATION		EXCLUDED	
	Subtotal Direct Construction Costs	**97.46**	**20,010,258**	**29,950,358**
	Allowance for Historical / Memorial Markers		25,000	
	Direct Cost Subtotal with GFP	**97.58**	**20,035,258**	
	Material Testing	0.35%	70,123	
	Owner's Design & Preconstruction Contingency	10.00%	2,003,526	
	Owner's Construction Contingency (after NTP)	5.00%	1,001,763	
	Permits	1.90%	380,670	
	Total Direct Construction Costs	**114.42**	**23,491,340**	
	Standard General Conditions (GC's Onsite Overhead)		1,565,008	
	Subtotal NET Construction Cost	**122.04**	**25,056,347**	
	GC's Off-Site & Overhead	3.40%	851,066	
	GC's General Liability Insurance	0.90%	225,507	
	Construction Cost w/o Bonds & Escalation	**127.28**	**26,132,920**	
	Builder's Risk Insurance	1.50%	391,619	
	Performance & Payment Bond	1.20%	313,295	
	Bid Bond	0.25%	65,270	
	Tap Fees		Excluded	
	Bidding Reserves		3,047,254	
	Total Estimated Cost of Construction	**145.88**	**29,950,358**	

DETAILED ESTIMATE

Estimate By:	Kyle Hoiland
Date:	22-Nov-13
Reviewed By:	Chris Squadra
Date:	25-Nov-13

Building GSF: 205,315 **Total Cost:** $20,010,258

DIV 02	Description	Quantity	Unit	TOTALS Cost/Unit	TOTALS Total Cost
	EXISTING CONDITIONS / BUILDING DEMOLITION				
	Concrete Sawcutting	100	LF	5.00	500
	Remove Sections of C&G	100	LF	8.20	820
	Remove Sections of Sidewalk	320	SF	3.46	1,106
	Asbestos Abatement (Allowance)	10	FLRS	30,000.00	300,000
	Demo 100% Building Interior	205,315	SF	2.53	519,447
	Demolition Disposal & Dumping Fees	73,001	CY	3.40	248,203
	High Pressure Wash @ Exterior Building	59,904	SF	1.40	83,866
	Remove Existing Caulking at Exterior Building Joints	6,240	LF	2.50	15,600
	Remove Existing Roof @ Top of Building	20,532	SF	1.50	30,797
	Remove Existing Roof @ North & East Entries	480	SF	1.50	720
	Remove Railroad Ties @ NE Corner	16	HRS	35.00	560
	Remove Windows	432	EA	125.00	54,000
	Remove & Salvage All Doors	444	EA	75.00	33,300
	Scaffolding (erect & dismantle)	599	CSF	198.95	119,179
	Remove Metal Railing @ Interior Stairs	560	LF	25.00	14,000
	SUBTOTAL EXISTING CONDITIONS/DEMOLITION				**1,422,098**

DIV 03	Description	Quantity	Unit	TOTALS Cost/Unit	TOTALS Total Cost
	CONCRETE / FOUNDATIONS				
	Repair Precast Concrete Panels w/ Aggregate Finish (10% of Exterior Skin)	5,990	SF	35.00	209,664
	Replace Precast Concrete Walls w/ Aggregate Finish @ Top Level Penthouse	1,800	SF	48.08	86,544
	Repair Concrete Cracking & Spalling @ Columns	1,000	SF	11.55	11,550
	Repair Concrete Cracking & Spalling @ Floors	2,500	SF	4.80	12,000
	Crane / Hoisting	80	HRS	275.00	22,000
	SUBTOTAL FOUNDATIONS				**341,758**

DIV 04	Description	Quantity	Unit	TOTALS Cost/Unit	TOTALS Total Cost
	MASONRY				
	Repair Stone Panel at SE Corner	1	LS	2,500.00	2,500
	SUBTOTAL MASONRY				**2,500**

DIV 05	Description	Quantity	Unit	TOTALS Cost/Unit	TOTALS Total Cost
	METALS				
	New Interior Guardrails	560	LF	128.20	71,792
	Interior Grab Railings				Excluded
	SUBTOTAL METALS				**71,792**

DIV 06	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	WOODS				
	Rough Carpentry Wood Materials	205,315	SF	0.75	153,986
	Rough Carpentry Labor	2,500	HRS	48.00	120,000
	**Time & materials for miscellaneous building shoring, safety railings/barricades, blocking, substrate repairs*				
	5" Wood Chair Rail @ Floor Lobbies & Corridors	5,990	LF	4.30	25,759
	SUBTOTAL WOODS				**299,745**

DIV 07	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	THERMAL & MOISTURE PROTECTION				
	TPO Membrane Roof @ Top Level	20,532	SF	9.20	188,890
	TPO Membrane Roof @ N & E Entries	480	SF	9.20	4,416
	Metal Fascia, Flashings, & Trims				w/ Above
	Scuppers, Gutters & Downspouts	624	LF	16.20	10,109
	Wall Insulation - 2" spray foam, interior cavity	59,904	SF	1.90	113,818
	1" Backer Rod @ Precast Panels	6,240	LF	0.93	5,803
	Concrete Caulking @ Precast Panels	6,240	LF	6.46	40,310
	Miscellaneous Caulking & Sealants @ Interior	205,315	SF	1.20	246,378
	Miscellaneous Fireproofing Repair (Allowance)	10,000	SF	2.50	25,000
	Exterior Stucco Finish @ Entry Soffits (repair water damaged areas)	480	SF	9.50	4,560
	SUBTOTAL THERMAL				**639,284**

DIV 08	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	OPENINGS				
	Int SC Wood Door Hardware	353	EA	326.00	115,078
	Int SC Wood Door, Half-Lite, Frame & Hardware	64	EA	326.00	20,864
	Int HM Steel Door Hardware - Throughout Building	24	EA	439.00	10,536
	3'-0"x 7'-0" Int HM Steel Door, Frame & Hardware - Roof Penthouse	2	EA	1,987.17	3,974
	PR 3'-0"x 7'-0" Int HM Steel Door, Frame & Hardware	1	EA	4,410.90	4,411
	ADA Openers @ N & E Entries	2	EA	2,250.00	4,500
	Mechanical Access Doors	206	EA	250.00	51,500
	Install New Punch Windows (4' x 6')	432	EA	1,716.00	741,312
	SUBTOTAL OPENINGS				**952,175**

DIV 09	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	INTERIOR FINISHES				
	Metal Stud Wall Framing w/ (2) layers of Gyp Board	164,252	SF	2.90	476,331
	5/8" Gyp Bd Exterior Walls	59,904	SF	1.10	65,894
	5/8" Gyp Bd Ceilings & Soffits	20,532	SF	3.10	63,648
	Install Slip Joints between non-load bearing walls & structural framing (Allowance)	1	LS	10,000.00	10,000
	ACT Ceilings @ Lobby & Corridor Areas Only	184,784	SF	3.21	593,155
	Gyp Bd Detailing @ Int Soffits, Cols, etc.	1	LS	10,000.00	10,000
	Carpet @ Offices & Corridors	164,252	SF	3.28	538,747
	Terrazo Flooring @ Floor Lobbies	30,797	SF	20.00	615,945

	VCT	1,027	SF	1.80	1,848
	Vinyl Base	28,704	LF	2.20	63,149
	Microbial Athletic Flooring @ Workout Room	2,000	SF	12.00	24,000
	Wall Coverings (Entry Lobby)	1,265	SF	3.90	4,933
	Wall Coverings (Corridors)	7,488	SF	3.90	29,203
	Ceramic Floor Tile @ Restrooms	6,000	SF	10.20	61,200
	4 x 4 Ceramic Wall Tile (6'-0" a.f.f.)	8,400	SF	12.40	104,160
	Roppe Raised Dot Rubber Flooring @ Vestibules	250	SF	7.30	1,825
	Paint Gyp Bd Walls & Ceilings w/2 Coats Latex	244,688	SF	0.60	146,813
	Miscellaneous Accent Painting Allowance	1	LS	5,000.00	5,000
	Stain 5" Chair Rail @ Corridors	5,990	LF	1.20	7,188
	Stain & Seal 3'-0"x 7'-0" SC Wood Door & Frame	353	EA	83.20	29,370
	Stain & Seal 3'-0"x 7'-0" SC w/ Half-Lite, Wood Door & Frame	64	EA	83.20	5,325
	Paint 3'-0"x 7'-0" HM Door & Frame	2	EA	68.30	137
	Paint PR 3'-0"x 7'-0" HM Door & Frame	1	EA	129.77	130
	Paint New Interior Guard Rail	560	LF	5.70	3,192
	Miscellaneous Paint Repair @ Exposed Structural Metal	10,000	SF	3.70	37,000
	SUBTOTAL INTERIOR FINISHES				**2,898,191**

DIV 10	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	SPECIALITIES				
	Movable Office Partitions System				Excluded
	New Bath Hardware				Excluded
	Fire Extinguishers (2 per floor)	20	EA	175.00	3,500
	Corner Guards				Excluded
	Code Required Signage	120	EA	55.20	6,624
	Wayfinding Signage	60	EA	276.00	16,560
	Access Ladders @ Penthouse	2	EA	500.00	1,000
	SUBTOTAL SPECIALTIES				**27,684**

DIV 11	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	EQUIPMENT				
	Refrigerator				Excluded
	Gas Range				Excluded
	Dishwasher				Excluded
	Microwave				Excluded
	Food Disposal				Excluded
	Appliance Installation				Excluded
	Accordion Wall Partitions				Excluded
	Kitchen & Food Service Equipment				Excluded
	Other Office Equipment Not Listed				Excluded
	SUBTOTAL EQUIPMENT				**EXCLUDED**

DIV 12	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	FURNISHINGS				
	East Entry Receptionist Desk	12	LF	150.00	1,800
	Plastic Laminate Countertops	144	SF	28.00	4,032
	Solid Surface Countertops				Excluded
	Copy / Print / Mail Center Casework				Excluded
	Kitchen / Break Room Casework	160	LF	150.00	24,000
	Window Roller Blinds - no valances, installed				Excluded
	Display Cases				Excluded
	Marker Boards				Excluded
	Tackboards				Excluded
	Office Furnishings & Other Building FF & E				Excluded

	SUBTOTAL FURNISHINGS				**29,832**

DIV 13	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	SPECIAL CONSTRUCTION				
	Alternative Energy Systems				Excluded
	Alternative Fuel Vehicle Fueling Stations				Excluded
	SUBTOTAL SPECIAL CONSTRUCTION				**EXCLUDED**

DIV 14	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	CONVEYING SYSTEMS				
	Elevator Service Call - Verify Current Condition & Maintenance Plan	1	LS	750.00	750
	SUBTOTAL CONVEYING SYSTEMS				**750**

DIV 21	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	FIRE SUPPRESSION				
	Fire Sprinklers - Full Replacement	205,315	SF	10.62	2,180,445
	Backflow Prevention				Excluded
	FDC				Excluded
	Booster Pump (Allowance)				Excluded
	SUBTOTAL FIRE SUPPRESSION				**2,180,445**

DIV 22	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	PLUMBING				
	Demo Existing Plumbing	205,315	SF	2.00	410,630
	Plumbing Systems - Full Replacement	205,315	SF	8.63	1,771,868
	ADA Lavatories	40	EA	625.00	25,000
	ADA Faucets	40	EA	195.00	7,800
	ADA Drinking Fountains	10	EA	495.00	4,950
	Kitchen Sink w/ Garbage Disposal	10	EA	690.00	6,900
	SUBTOTAL PLUMBING				**2,227,148**

DIV 23	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	HVAC				
	HVAC - Full Replacement	205,315	SF	26.50	5,440,848
	HVAC - Add Heating Coil @ Penthouse				w/ Above
	HVAC - Workout Room				w/ Above
	Upgrade HVAC Controls	205,315	SF	1.60	328,504
	SUBTOTAL HVAC				**5,769,352**

DIV 26	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	ELECTRICAL				
	Demo Existing Electrical	205,315	SF	2.00	410,630
	New Electrical Wiring & Conduit	205,315	SF	6.21	1,275,006
	Localized Light Controls	205,315	SF	2.00	410,630
	Remove Light Fixtures throughout Building	205,315	SF	1.00	205,315
	Replace Light Fixtures w/ LED	205,315	SF	2.50	513,288
	Emergency GenSet (50 kVA)				Excluded
	UPS System				Excluded
	Solar Photovoltaic System				Excluded
	Wind Turbine System				Excluded
	Lightning Protection System				Excluded
	SUBTOTAL ELECTRICAL				**2,814,869**

DIV 27	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	DATA / COMMUNICATIONS				
	Fire Alarm System	205,315	SF	0.92	188,890
	Data & Communications Conduit	205,315	SF	0.63	129,348
	Data & Communications Equipment				Excluded
	A/V Equipment				Excluded
	SUBTOTAL COMMUNICATIONS				**318,238**

DIV 032	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	SITE IMPROVEMENTS				
	Paving				
	4" Asphalt Patchback	960	SF	3.61	3,468
	Concrete Sidewalks - Seal Cracks	500	LF	6.00	3,000
	New 6" x 18" F.R. Concrete Curb & Gutter	100	LF	36.23	3,623
	New 4" Sidewalk	320	SF	6.33	2,026
	Landscape				
	Fine Grade Topsoil	500	SF	2.00	1,000
	Sod Repair	500	SF	0.56	280
	Irrigation Repair	1	AL	1,000.00	1,000
	SUBTOTAL SITE IMPROVEMENTS				**14,396**

DIV 33	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	SITE CIVIL/MECHANICAL UTILITIES				
	Secondary Utilities to Building				
	2" Copper Water Line (Incl. Valves, Connections, Trenching w/ Bedding)				Excluded
	6" Sewer Service				Excluded
	Gas Line Trenching				Excluded

	Electrical Service				Excluded
	Phone & Data Service Trenching				Excluded
	SUBTOTAL SITE CIVIL/MECHANICAL UTILITES				**EXCLUDED**

TOTAL COST -					**20,010,258**
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