CAPITOL COMPLEX MASTER PLAN

FINDINGS & RECOMMENDATIONS (F & R) NEEDS ASSESSMENT

EXECUTIVE RESIDENCE & CARRIAGE HOUSE, 400 EAST 8TH AVENUE (DENVER)

NOVEMBER 2014

RNL

FINDINGS & RECOMMENDATIONS (F&R) NEEDS ASSESSMENT

EXECUTIVE RESIDENCE & CARRIAGE HOUSE
400 EAST 8TH AVENUE (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 Executive Residence at 400 East 8th Avenue 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.

The Executive Residence was placed on the Historic Register on December 3, 1969 and contributes to the architectural history of both the City of Denver and the State of Colorado. All work on the property should follow the Secretary of the Interior's Standards for the Treatment of Historic Properties and the National Park Service (NPS) Preservation Briefs. In general the building is in poor condition. A poor condition rating refers to the fact that the Executive Residence 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. Replace electric panel boards and wiring that are past their useful life. This recommendation encompasses life safety, loss of use/reliability, and overall energy efficiency issues and is due to the age of the panels and wiring.

   High Level Cost Estimate: $502,341

2. Rebuild brick wall adjacent to visitor center. This recommendation encompasses life safety issues and is due to the fact that the wall is failing structurally along the eastern and southern portions of the terraced grounds, near the Tebo Visitor's Center.

   High Level Cost Estimate: $198,017

3. Repair drainage problems. This recommendation encompasses loss of use/reliability issues and is due to damage that has occurred to the building and site retaining walls from standing water and other drainage problems.

   High Level Cost Estimate: $1,197,887

4. Tuck point the stone and brick. This recommendation encompasses issues with the building's exterior finishes and is due to the deterioration of the mortar which is creating access points by which water can penetrate the building envelope.

   High Level Cost Estimate: $777,000

5. Replace roof. This recommendation encompasses loss of use/reliability issues and is due to the age of the roof and problems with water leaks.

   High Level Cost Estimate: $518,845

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

$7,266,211

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:

$8,540,834

1.0 OVERVIEW

1.0-A ARCHITECTURE OVERVIEW

The Executive Residence and Carriage House, known officially as the "Governor's Residence at the Boettcher Mansion" were constructed in 1908 and are located in Denver's Capitol Hill Neighborhood on the southeast corner of Logan Street and East 8th Avenue. The residence was originally designed by Walter Scott Cheesman and his daughter, Gladys Evans, for use as a private family residence. The home historically served as the private residence of the Cheesman, Evans, and Boettcher families respectively. During this time, the residence and its grounds were expanded and the Boettcher family acquired furnishings and art that remain part of the mansion collection today. The residence was donated to the State of Colorado for use as a governor's residence by the Boettcher Foundation in 1959 and has been occupied by Colorado's governors ever since. The Carriage House was recently remodeled in 2006. The Executive Residence was added to the U.S. Register of National Historic Places on December 3, 1969.

The Executive Residence, a predominantly brick construction with a two-story Roman Ionic colonnade on the west side, is a three-story building with a basement and grosses 26,431 square feet of space. The Carriage House is a two-story brick construction and grosses 4,837 square feet of space.

The architectural assessment of the Executive Residence at 400 East 8th Avenue included reviews of the existing building documentation 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 October 22, 2013, building maintenance personnel provided building history and information on the layout, finishes, maintenance routines, systems, and the dates of repairs and upgrades. The Carriage House was inaccessible due to a State event which prevented access to the building and the surrounding grounds. In general, the building is in fair condition, considering its age. 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. One of the main concerns is the age and condition of the roof. Other concerns include the need to tuck point the exterior stone and brick and the need to restore the windows and wood trim around the exterior of the building. These concerns encompass loss of use/reliability and overall energy efficiency issues. These findings, along with recommendations for repairs, are detailed in the body of this report.

Note: As an historic property, the Executive Residence and surrounding grounds and accessory structures should comply with the Secretary of the Interior's Standards for the Treatment of Historic Properties and the National Park Service (NPS) Preservation Briefs.

1.0-B STRUCTURAL OVERVIEW

Martin/Martin conducted a building condition assessment on October 22, 2013 of the executive residence located at 400 East 8th Avenue in Denver, Colorado. The purpose of our condition assessment was to identify structural defects, damage, and deterioration.

The executive residence is a predominately brick and stone three-story house. The roof appeared to be typical hip and valley rafter or joist construction covered with a standard asphalt shingle roofing system, although the central flat roof is covered by a membrane roof. Interior framing and finishes were typically wood walls with plaster and lath finishes.

The concrete and brick at the building exterior has some areas requiring preventative maintenance. The structural framing that was readily observable at the building interior is in fair condition. A storage area on the upper floor appeared to have some cracking at corners of the plaster and lath, but nothing was structurally concerning. An exterior brick wall at the southeast corner of the property should be partially demolished and rebuilt.

1.O-C CIVIL OVERVIEW

The Colorado Executive Residence Building site is approximately 1.86 acres with a 0.5 acre parking lot and is located at 400 East 8th Avenue in Denver, Colorado. The existing site consists of the building, site landscape, parking lot and street right-of-way including sidewalk and landscaping. The main building entrance is accessed via stairs on the North side of the building. The site surrounding the building is well maintained and has been improved over the course of the 105 years since the initial construction.

The site exterior is generally in good condition. The site appears to be maintained regularly, with improvements to the exterior conducted in recent years. The main concern regarding the Colorado Executive Building is the drainage in the south lawn. There are numerous locations where the marble wall has fractured most likely due to standing water along the back side of the wall. It is recommend that the site be assessed immediately for drainage with the potential necessity of installing drains. While the existing building functions in its current state, improvements can be made to further maintain the existing site for posterity and improve aesthetics.

1.0-D MECHANICAL, ELECTRICAL, AND PLUMBING OVERVIEW

The electrical and mechanical assessment of the Executive Residence and Carriage House was performed to observe the existing electrical and mechanical equipment installation and assess code and building energy efficiency issues. During the site survey, information about the building history, electrical and mechanical systems conditions, maintenance routines, and installation dates was provided.

The main concerns with the electrical systems in this building are the age of the electrical equipment and wiring. The main switchgear is past its useful life. This will lead to longer outages because it will be difficult to find replacement parts.

Life safety features like fire and smoke dampers should be verified to ensure the integrity of fire barriers is maintained. The elevator operations need to be modified to meet the current code requirements. Features like elevator recall etc. should be provided.

The building has wet sprinkler system. Some of the furnace rooms are used as storage rooms which is a fire hazard. It is recommended to remove the combustible material stored in the furnace room.

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.

The building has energy efficient ground source heat pumps with supplemental boilers for heating and cooling. For reliability the existing wireless controls may be replaced with wired controls.

1.0-E VOICE AND DATA OVERVIEW

The Voice and Data IT/Telecommunications Infrastructure assessment report provides recommendations for the design and construction of IT/Telecommunications Infrastructure required to support Voice/Data and other technology systems within the Executive Residence and Carriage House, for renovation projects. Much of the building's existing IT/Telecommunications infrastructure may not be consistent with current industry standards and best practice installation methods. The current IT infrastructure may not properly 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. Existing network cabling may have bandwidth limitations as compared to that of more robust, industry standard Cat6 or Cat6A cable specifications. It should be noted where referenced, that IT systems infrastructure not only includes the cabling, but the cabling pathways and the spaces (rooms/closets) that support the network cabling. Spaces requiring to be upgraded in the facility may include technology systems equipment closets. Backbone infrastructure shall include necessary cabling pathways between equipment closets where needed, to support installation of both backbone cabling. Hardwired network connectivity should be provided to station outlet locations in administrative and office areas, as appropriate. Category 6, at minimum, UTP cable shall be installed from the telecom outlets and other IP field devices to termination hardware in technology equipment closet(s), using horizontal cabling pathways. A proper grounding and bonding system should be provisioned for, and will provide a uniform ground throughout the communications network, to ensure safe and reliable operation of the systems supported by the network. These recommendations may be used for IT/Telecom Infrastructure program development, space planning, and budgeting of these systems at a conceptual design level. Industry standard and best practice design methodology shall be applied, including BICSI and TIA/EIA design and construction guidelines. For infrastructure renovation work within the facilities, Governor's Office of Information Technology (OIT) design criteria documents should be complied with, as applicable.

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 Executive Residence and Carriage House. 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., because of the uniqueness of the building the above mentioned guidelines should be applied with reverence to the historical attributes of the residence.

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 Executive Residence and Carriage house 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 & 2 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.

2.0 OVERALL BUILDING ASSESSMENT FINDINGS AND RECOMENDATIONS

2.1 ARCHITECTURE

2.1-A EXTERIOR BUILDING ENVELOPE/SITE

General

The Executive Residence, a predominantly brick and stone construction with a two-story Roman Ionic colonnade on the west side, is a three-story building with a basement. The Carriage House is a two-story brick construction. The Carriage House was inaccessible due to a State event which prevented access to the building and the surrounding grounds at the time of the site survey visit. It was reported that the Carriage House was completely renovated around 2006 and that it is in good to fair condition.

The exterior facade of the Executive Residence is in the Colonial architectural style with brick walls, wood trim painted white, keystones and window sill ledges, and a rusticated foundation. The walkways throughout the terraced site consist of areas of brick, stone, and concrete pavers.

The porch-covered entrances exist on the north, east, and west sides of the building. The East 8th Avenue entrance on the north side is considered the front, grand entrance to the residence, with a stairway leading up to the First Floor. The entrance located on the north end of the east side of the building includes an accessible ramp, leads to the First Floor, and is reportedly the main entrance used by building staff and the public. There are additional entrances located along the south side of the building leading out from the First Floor to the terraced grounds and a service entrance on the southeast corner of the building.

The majority of the roofing appears to consist of residential-grade asphalt shingles. The main roof slopes up to a central flat area which appears to be covered with an EPDM roofing membrane.

The building envelope is in fair condition overall. Various elements are showing the effects of deferred maintenance, others are simply damaged or worn out. Some damage appears to have resulted from the irrigation systems around the building.

It was reported that there may be asbestos in the soil of the crawl space under the kitchen area of the Carriage House and that this soil is currently covered with plastic sheeting.

Note: As an historic property, the Executive Residence and surrounding grounds and accessory structures should comply with the Secretary of the Interior's Standards for the Treatment of Historic Properties and the National Park Service (NPS) Preservation Briefs.

Front/North Elevation of the Executive Residence

Front/North covered entry porch leading to the First Floor of the Executive Residence

Side/East Elevation of the Executive Residence

South/Back Elevation of the Executive Residence

West covered entry porch leading to the First Floor of the Executive Residence

West/Side, view of the two-story Roman Ionic colonnade

View of the terraced grounds on the south side of the building, looking south towards the Carriage House

Cladding

The brick walls around the exterior of the building are in fair condition overall. It was reported that the brick was tuck pointed approximately ten years ago but that the mortar needs attention. It was noted during the site survey visit that the mortar between the brick is in fair condition overall with some areas of deterioration or missing mortar noted (see Fig. 2.1.A.1).

The rusticated foundation around the exterior of the building was noted to be in fair to poor condition overall with areas of widespread soiling and areas of damage with cracking and spalling (see Fig. 2.1.A.2, Fig. 2.1.A.3,

Fig. 2.1.A.4, and Fig. 2.1.A.5). Some of the soiling of the foundation appears to be due to irrigation that is saturating the building, especially along the south side of the building (see Fig. 2.1.A.6 and Fig. 2.1.A.7). The mortar in the joints between the foundation blocks was noted to be deteriorating in areas around the building and leaving the building envelope vulnerable to water penetration (see Fig. 2.1.A.8 and Fig. 2.1.A.9). The repaired areas of the spalling foundation blocks appear to be temporary fixes with general deterioration of the repairs noted (see Fig. 2.1.A.10 and Fig. 2.1.A.11). The window ledges around the building appear to be concrete or stone and were noted to be generally soiled with some cracking that was readily observable from the ground (see Fig. 2.1.A.12).

The painted wood trim around the exterior of the building is in poor condition overall with widespread peeling and cracking of the paint noted, exposing the wood in some instances, and with general soiling noted (see Fig. 2.1.A.13, Fig. 2.1.A.14, Fig. 2.1.A.15, and Fig. 2.1.A.16). It was reported that much of the exterior wood is rotting. There were decorative trim elements observed to have cracking of the multiple layers of paint that have been built up over the years (see Fig. 2.1.A.17). The white and grey painted wood porch at the southeast corner of the building has widespread peeling and cracking, exposing the wood (see Fig. 2.1.A.18). The decorative wood elements along the railings at the flat roof deck areas around the building were also observed to have peeling and cracking paint, with extensive deterioration of the wood noted in spots (see Fig. 2.1.A.19). The top surface of the railings and posts appears to be generally flat around the exterior of the building; allowing water to stand and cause damage (see Fig. 2.1.A.20). It was reported that a group has volunteered to repair or replace and scrape and repaint the wood around the exterior of the building.

The paint on the columns around the exterior of the building was observed to be peeling and cracking, exposing the substrate material underneath (see Fig. 2.1.A.21 and Fig. 2.1.A.22). It was reported that the columns need to be repaired or replaced around the exterior of the building. It was reported that all of the exterior wood may be coated with lead-based paint and appropriate abatement methods will need to be applied prior to sanding or scraping any of the painted surfaces.

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

It was reported that the foundation of the Carriage House is in need of sealer below grade.

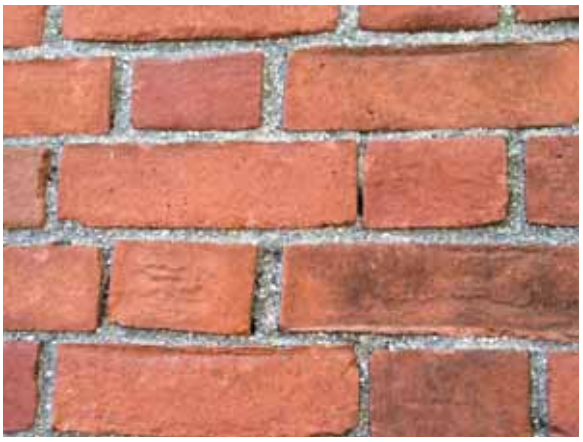

Fig. 2.1.A.1 Areas of deteriorating or missing mortar noted in a few areas of the brick walls around the exterior of the building.

Fig. 2.1.A.2 Areas of widespread soiling of the foundation noted around the exterior of the building.

Fig. 2.1.A.3 Cracking of the foundation.

Fig. 2.1.A.4 Spalling of the foundation blocks.

Fig. 2.1.A.5 Cracking and spalling noted at the foundation.

Fig. 2.1.A.6 Soiling and damage that is likely due to irrigation.

Fig. 2.1.A.7 Soiling and damage that is likely due to irrigation.

Fig. 2.1.A.8 Deterioration of the mortar noted at the foundation.

Fig. 2.1.A.9 Deterioration of the mortar noted at the brick and at the foundation.

Fig. 2.1.A.10 Areas of poor repairs of the foundation are beginning to deteriorate.

Fig. 2.1.A.11 Areas of poor repairs of the foundation are beginning to deteriorate.

Fig. 2.1.A.12 Generally soiled window ledges with some cracking readily observable from the ground.

Fig. 2.1.A.13 Generally soiled decorative trim with cracking and peeling paint.

Fig. 2.1.A.14 Widespread peeling and cracking paint noted at the wood trim around the exterior of the building.

Fig. 2.1.A.15 Widespread peeling and cracking paint noted at the wood trim around the exterior of the building.

Fig. 2.1.A.16 Widespread peeling and cracking paint noted at the wood trim around the exterior of the building.

Fig. 2.1.A.17 Decorative wood trim with multiple layers of paint observed to be cracking.

Fig. 2.1.A.18 Widespread deterioration of the paint at the southeast porch is exposing the wood to the elements.

Fig. 2.1.A.19 Extensive deterioration noted at the decorative elements along the roof deck railings.

Fig. 2.1.A.20 The top surface of the roof deck railings appears to be generally flat, allowing water to stand and cause damage.

Fig. 2.1.A.21 Cracking and peeling paint observed at the columns.

Fig. 2.1.A.22 Cracking and peeling paint exposing the column's substrate material underneath to the elements.

Recommendations:

- All restoration work should be in keeping with the historic status of the Executive Residence.
- Tuck point the brick, stone, and foundation mortar joints around the exterior of the building to prevent potential water penetration.
- Clean the soiled/stained areas of the foundation using an approved method.
- Move or readjust any irrigation lines that are currently saturating the building's walls or the site's retaining walls and stairways with water.
- Repair or replace cracked, spalling, or previously patched areas of the foundation, to match existing.
- Clean the soiled/stained window ledges around the exterior of the building using an approved method. Repair or replace any areas of damage, to match existing.
- Continue with the plan to repair or replace and to scrape and repaint the wood trim and decorative elements around the building, using an approved method, to match existing.
- Based on the construction date of the building, sampling for lead paint must be completed if any painted surfaces will be sanded or scraped.
- Repair or replace any damaged wood at the southeast porch and refinish to match existing.
- Replace the railings around the flat roof deck areas with elements that match the existing but provide a sloped top surface to allow water to

drain away, if allowed per historic designation guidelines.

- Further investigate the condition of the columns around the exterior of the building and repair or replace as necessary, to match existing.
- Reseal the foundation of the Carriage House below grade as necessary.

Glazing Systems and Doors

The windows are single pane and appear original to the building. There are stained glass windows and leaded glass windows around the exterior of the building, especially on the north and south sides of the building at the First Floor. There are storm windows installed around the majority of the building with the exception of the areas with the leaded glass windows on the south side of the First Floor. It was reported that the windows at the Second and Third Floors have been refurbished recently. There was evidence of water damage noted on the interior side of some of the windows observed throughout the First, Second, and Third Floors (see Fig. 2.1.A.23 and Fig. 2.1.A.24). The First Floor windows were noted to have frames with peeling paint and some deterioration of the wood around the exterior of the building (see Fig. 2.1.A.25 and Fig. 2.1.A.26). The window wells on the east side of the building were noted to have evidence of water saturation (see Fig. 2.1.A.27) and to have debris collecting in a few areas (see Fig. 2.1.A.28).

Fig. 2.1.A.23 Damage noted on the interior side of a few of the First through Third Floor windows.

Fig. 2.1.A.24 Damage noted on the interior side of a few of the First through Third Floor windows.

Fig. 2.1.A.25 First Floor windows noted to have peeling and cracking paint at the wood frames.

Fig. 2.1.A.26 First Floor windows noted to have peeling and cracking paint and deterioration of the wood frames.

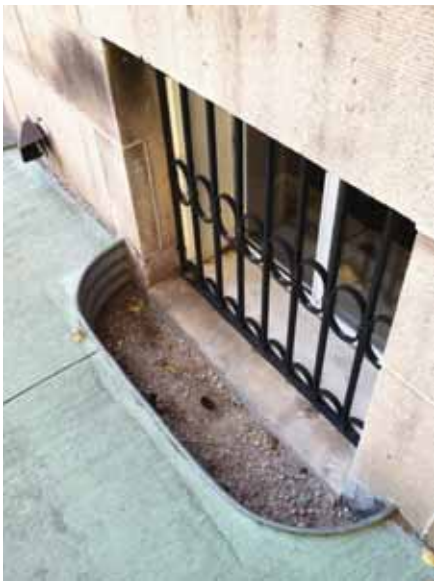

Fig. 2.1.A.27 Window well on the east side of the building observed to have evidence of water saturation.

Fig. 2.1.A.28 Debris observed in a few of the window wells around the building.

The entrance doors around the building appear to be in generally fair condition overall with some general wear-and-tear noted overall. The doors on the west side of the building at the covered porch were noted to have peeling and cracking paint and general deterioration (see Fig. 2.1.A.29). The patio doors leading from the First Floor Palm Room on the east end of the south side of the building have some peeling and cracking paint, especially at the side-lites on either side of the doors (see Fig. 2.1.A.30). These doors also show evidence of water intrusion on the interior side of the doors (see Fig. 2.1.A.31). The wood door in the brick perimeter wall on the east side leading from the terraced grounds south of the Executive Residence to the parking lot is generally deteriorating with cracking of the wood and peeling paint noted (see Fig. 2.1.A.32).

Fig. 2.1.A.29 Doors with peeling and cracking paint and general deterioration at the covered porch on the west side of the building.

Fig. 2.1.A.30 Cracking and peeling paint noted at the side-lites on either side of the patio doors on the east end of the south side of the First Floor Palm Room.

Fig. 2.1.A.31 Evidence of water intrusion observed on the interior side of the First Floor Palm Room patio doors on the east end of the south side of the building.

Fig. 2.1.A.32 Wood door in the east brick perimeter wall observed to have cracking wood and peeling paint.

Recommendations:

- All restoration work should be in keeping with the historic status of the Executive Residence.
- Repair or replace any damaged window frames on the interior side of the building and scrape and repaint, to match existing. Determine the cause of any water damage and repair as necessary.
- Repair or replace any damaged window frames and scrape and repaint as necessary around the exterior of the building at the First Floor.
- Scrape and repaint the window frames around the exterior of the building at the First Floor, to match existing.
- Determine the cause of water saturation occurring at any window wells around the building and repair as necessary.
- Remove any debris collecting in the window wells around the building.
- Repair or replace any damaged doors around the exterior of the building and site and paint, to match existing.
- Scrape and repaint the doors around the exterior of the building and site with worn and deteriorating paint, to match existing.
- Determine the cause of the water damage evident on the interior

side of the First Floor Palm Room patio doors on the east end of the south side of the building and repair as necessary. Clean and repair or replace any damaged or soiled areas of the doors, side-lites, and interior finishes.

Roof

The majority of the roofing appears to consist of residential-grade asphalt shingles which are showing signs of aging. It was reported that the age of the roof is unknown. It was further reported that there are known leaks. Evidence of water damage was observed throughout the attic space (see Fig. 2.1.A.33, Fig. 2.1.A.34, and Fig. 2.1.A.35). Areas of deteriorating flashing and sealant were observed at the roof (see Fig. 2.1.A.36). Corrosion and deteriorating sealant were noted at the readily observable roof vents (see Fig. 2.1.A.37). There were a few anchor clips noted at the areas of the main roof included in the site survey visit. No other means of fall protection appears to exist at the main roof. A generally flat area around the perimeter of the main roof is covered with an EPDM roofing membrane that has been patched, is collecting soil, and appears to be deteriorating with age (see Fig. 2.1.A.38). The main roof slopes up to a central flat area which appears to be covered with an EPDM roofing membrane.

The flat roof deck areas are covered in either a rubber membrane, an EPDM roofing membrane that has been patched, or areas ballasted with rocks. There is a skylight at a Second Floor roof deck on the south side of the building. The roof area over the front porch on the north side of the building has a rubber membrane that is collecting leaves and debris (see Fig. 2.1.A.39). The area of the same roof along the front edge was observed to be collecting leaves and had standing water at the time of the site survey visit (see Fig. 2.1.A.40). The areas with the EPDM roofing membrane are showing signs of deterioration including deterioration of the patches (see Fig. 2.1.A.41). Areas of the flat roof decks with an EPDM roofing membrane were observed to have standing water during the site survey visit (see Fig. 2.1.A.42). It was reported that the flat roof deck areas have issues with standing water. The flat roof decks with ballast appear to be in fair condition overall with areas of thin or no ballast noted, especially along the perimeter edges (see Fig. 2.1.A.43). Minor damage was noted to the composite roof deck walkway on the south side of the building (see Fig. 2.1.A.44). Deterioration was noted to the wood decking on the porch outside of the Second Floor office on the west side of the building (see Fig. 2.1.A.45).

Fig. 2.1.A.33 Evidence of widespread water intrusion and damage noted throughout the attic.

Fig. 2.1.A.34 Evidence of widespread water intrusion and damage noted throughout the attic.

Fig. 2.1.A.35 Evidence of widespread water intrusion and damage noted throughout the attic.

Fig. 2.1.A.36 Areas of deteriorating flashing and sealant observed on the roof.

Fig. 2.1.A.37 Corrosion and deteriorating sealant noted at the readily observable roof vents.

Fig. 2.1.A.38 The generally flat area around the perimeter of the main roof is covered with an EPDM roofing membrane that has been patched, is collecting soil, and appears to be deteriorating with age.

Fig. 2.1.A.39 Leaves and debris collecting at the roof over the front porch on the north side of the building.

Fig. 2.1.A.40 Leaves and standing water observed along the front edge of the roof over the front porch on the north side of the building.

Fig. 2.1.A.41 General deterioration of the EPDM membrane, former patchwork, and sealant noted at the flat roof deck areas.

Fig. 2.1.A.42 Areas of standing water observed at the flat roof decks covered with an EPDM membrane.

Fig. 2.1.A.43 Areas with thin or no ballast along the perimeter edges of the flat roof decks.

Fig. 2.1.A.44 Minor damage noted at the composite roof deck walkway on the south side of the building.

Fig. 2.1.A.45 Deterioration of the wood decking noted at the porch outside of the Second Floor office on the west side of the building.

Recommendations:

- All restoration work should be in keeping with the historic status of the Executive Residence.
- Replace the existing asphalt shingle, EPDM membrane, rubber membrane, and ballasted roofing with new roofing systems, as well as around the skylights, including new membranes, roof drains, roof vents, and flashing.
- Repair all damage caused by roof leaks throughout the interior of the attic.
- Repair or replace any damage of the composite roof deck walkway on the south side of the building.
- Refinish the wood decking on the porch outside of the Second Floor office on the west side of the building. Ensure the porch has a positive slope to allow water to drain away.

Site Elements

The site paving throughout the grounds included in the site survey visit consists of brick, stone, tile, and concrete in fair condition overall.

Deterioration and spalling was noted at areas of the concrete edging (see Fig. 2.1.A.46). There were a number of areas noted to have deteriorating mortar, or mortar missing entirely, from between the paving elements, exposing the walkway system to water penetration (see Fig. 2.1.A.47, Fig. 2.1.A.48, Fig. 2.1.A.49 and Fig. 2.1.A.50). An area of damaged tile pavers creating a potential tripping hazard was noted at the exterior patio on the southeast side of the First Floor Palm Room (see Fig. 2.1.A.51). Cracked paving was also noted along the outside edge of the southeast patio area at the guardrail posts (see Fig. 2.1.A.52). Soiling, likely due to irrigation, was noted at areas of the paving throughout the site, at the patios, and at the covered porch areas (see Fig. 2.1.A.53). It was reported that the flagstone joints in the paving areas near the fountains are too far apart and results in the flagstone cracking easily.

The exterior entrance stairways around the building were noted to have areas of spalling and cracking and soiling (see Fig. 2.1.A.54 and Fig. 2.1.A.55). The metal railings at the service entrance on the south end of the east side of the building are corroding, especially at the posts (see Fig. 2.1.A.56).

The retaining walls throughout the portions of the terraced grounds, located to the south of the Executive Residence, included in the site survey visit were noted to have widespread cracking and soiling (see Fig. 2.1.A.57, Fig. 2.1.A.58, Fig. 2.1.A.59, and Fig. 2.1.A.60). The railings along the curved white retaining wall were observed to be generally soiled overall (see Fig. 2.1.A.61). It was reported that water gets behind the curved white retaining wall and that the wall has been patched several times.

The brick perimeter walls, separating the east lawn and the terraced grounds of the Executive Residence from the Governor's Park to the south and east, were noted to be in fair to poor condition overall. The brick perimeter wall near the Tebo Visitor's Center at the southeast corner of the terraced grounds appears to be buckling and leaning, and generally failing structurally (see Fig. 2.1.A.62, Fig. 2.1.A.63, and Fig. 2.1.A.64). It was reported that a structural assessment of this portion of the wall was completed prior to the date of the site survey visit. The other portions of the brick perimeter walls were noted have widespread areas of general deterioration of the brick and painted coping blocks along the top of the walls (see Fig. 2.1.A.65 and Fig. 2.1.A.66). The mortar was noted be generally deteriorating, or missing entirely, from areas of the brick perimeter

walls (see Fig. 2.1.A.67). The brick wall between the east lawn and the Governor's Park has white paint that is in an advanced state of deterioration (see Fig. 2.1.A.68). The metal security spikes on top of a portion of the brick perimeter wall were observed to have evidence of corrosion (see Fig. 2.1.A.69).

There is an historic pergola on the northeast lawn that is showing evidence of wear-and-tear (see Fig. 2.1.A.70).

It was reported that the exterior fencing needs to be repaired and repainted. It was also reported that the upper hinge on the Logan Street gate is broken.

Fig. 2.1.A.46 Deterioration and spalling noted at areas of the concrete edging.

Fig. 2.1.A.47 Deteriorating mortar noted at areas of the brick pavers and stairways throughout the site.

Fig. 2.1.A.48 Deteriorating mortar noted between the stone stairway and tile paving at the porch on the west side of the building.

Fig. 2.1.A.49 Deteriorating mortar noted between areas of the stone pavers throughout the site.

Fig. 2.1.A.50 Deteriorating mortar noted between areas of the tile pavers throughout the site.

Fig. 2.1.A.51 An area of damaged tile pavers creating a potential tripping hazard noted at the patio on the southeast side of the First Floor Palm Room.

Fig. 2.1.A.52 Cracked paving noted at the guardrail posts along the edge of the patio on the southeast side of the First Floor Palm Room.

Fig. 2.1.A.53 Soiling noted to the paving at the covered porch on the west side of the building.

Fig. 2.1.A.54 Areas of spalling and damage observed at the exterior stairways around the building.

Fig. 2.1.A.55 Areas of spalling and soiling observed at the exterior stairways around the building.

Fig. 2.1.A.56 Corroding railing posts observed at the southeast service entrance.

Fig. 2.1.A.57 Widespread cracking observed at the curved white retaining wall and soiling of the seating and flat surfaces.

Fig. 2.1.A.58 Widespread cracking observed at the curved white retaining wall.

Fig. 2.1.A.59 Widespread cracking observed at the curved white retaining wall with soiling noted along the landscaped areas.

Fig. 2.1.A.60 Cracking observed at the seating and flat surfaces at the curved white retaining wall.

Fig. 2.1.A.61 Soiling noted at the railings along the curved white retaining wall.

Fig. 2.1.A.62 Portion of the brick perimeter wall noted to be failing structurally along the eastern and southern portions of the terraced grounds, near the Tebo Visitor's Center.

Fig. 2.1.A.63 Portion of the brick perimeter wall noted to be failing structurally along the eastern and southern portions of the terraced grounds, near the Tebo Visitor's Center.

Fig. 2.1.A.64 Portion of the brick perimeter wall noted to be failing structurally along the eastern and southern portions of the terraced grounds, near the Tebo Visitor's Center.

Fig. 2.1.A.65 General deterioration of the brick perimeter walls noted during the site survey visit.

Fig. 2.1.A.66 General deterioration and damage noted at the brick perimeter walls during the site survey visit.

Fig. 2.1.A.67 Cracking of the brick perimeter walls with deteriorating and missing mortar noted during the site survey visit.

Fig. 2.1.A.68 Paint observed to be in an advanced state of deterioration at the brick perimeter wall between the east lawn of the Executive Residence and the Governor's park.

Fig. 2.1.A.69 Corrosion of the metal spikes observed along the top of the brick perimeter wall.

Fig. 2.1.A.70 The historic pergola on the northeast lawn is showing evidence of wear-and-tear.

Recommendations

- All restoration work should be in keeping with the historic status of the Executive Residence and surrounding grounds.
- Repair or replace any areas of deteriorating or damaged site or patio paving and edging throughout, including the brick, stone, tile, and concrete paving. Adjust the width of the joints of the flagstone paving as necessary to prevent cracking and damage.
- Repair or replace any areas of deteriorating or damaged brick, stone, or concrete stairs around the building and throughout the site. Securely reattach railing posts as necessary, including the posts at the patio on the southeast corner of the First Floor Palm Room.
- Repair or replace any areas of deteriorating or missing mortar at the walkways or patio paving or at any of the stairs around the building and throughout the site.

- Clean the soiled/stained areas of the paving and stairways throughout using an approved method. Move or readjust any irrigation lines that are currently saturating the site's walkways and stairways with water.
- Repair or replace the corroding metal railings at the service entrance on the south end of the east side of the building.
- Repair or replace the deteriorating or damaged retaining walls throughout the terraced grounds. Determine the cause of the deterioration and damage and repair as necessary.
- Clean the soiled areas of the retaining walls and railings throughout the terraced grounds using an approved method. Move or readjust any irrigation lines that are currently saturating the site's retaining walls and railings with water.
- Remove and replace the portion of the brick perimeter wall near the Tebo Visitor's Center that is failing structurally, to match existing. Determine the cause of the structural failure and repair as necessary.
- Clean the remaining white paint off of the brick perimeter wall between the east lawn of the Executive Residence and the Governor's Park using an approved method.
- Repair or replace the deteriorating or damaged portions of the brick perimeter walls throughout the remainder of the site, including the deteriorating or damaged portions of the coping blocks, to match existing.
- Repair any cracks along the joints between the brick and tuck point the brick perimeter walls throughout the site.
- Remove the corrosion from the metal security spikes on top of portions of the brick perimeter wall, or replace as necessary, and repaint to match existing.
- Rehabilitate the historic pergola on the northeast lawn.
- Repair or replace any damaged areas of the exterior fencing as necessary and repaint.
- Repair or replace any damaged hardware and hinges on the Logan Street gate and other gates throughout the site 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 has 3 stories and a basement and a total floor area of 26,431 square feet. If this building was built today, it would be classified as Occupancy Group R (primary use of Residential Group R occupancies include, among others, the use of a building or structure, or a portion thereof, for sleeping purposes) per the 2012 edition of the International Building Code (IBC). The Executive Residence was originally built as a detached one-family dwelling, and remains a detached one-family dwelling, and should comply with the International Residential Code (IRC). It was reported that the lower floors of the residence are periodically used for meetings and events.

Note: As an historic property, the Executive Residence and surrounding grounds and accessory structures should comply with the Secretary of the Interior's Standards for the Treatment of Historic Properties and the National Park Service (NPS) Preservation Briefs.

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 Executive 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, unless historic designation guidelines take precedence.

There is a commercial grade kitchen area located on the east side of the First Floor. It was reported that the fire-suppression system at the stove-top exhaust hood in the Kitchen is dated. Requirements for commercial hood and duct systems and for automatic fire-extinguishing systems for commercial cooking equipment and exhaust systems should comply with Chapter 9 of the IBC (2012) and with National Fire Protection Association Standards (NFPA).

There is a walk-in refrigerator and a walk-in freezer with exterior latch-style closure systems located off the hallway to the south of the Kitchen on the First Floor (see Fig. 2.1.B.1). The doors must be openable from the inside occupiable space of the refrigerator and freezer per code requirements.

Fig. 2.1.B.1 Latching hardware observed on the historic walk-in refrigerator located south of the Kitchen on the east side of the First Floor.

Recommendations:

- All restoration work should be in keeping with the historic status of the Executive Residence.
- Verify the type of latching hardware on the walk-in refrigerator and walk-in freezer and replace as necessary per code requirements.
- Upgrade the fire-suppression system at the stove-top exhaust hood in the Kitchen on the east side of the First Floor per code requirements.

Fire Suppression Systems

There appears to be a fully automatic sprinkler system throughout the Basement Floor, the Second Floor, and the Third Floor, including the attic storage space. It was reported that the only areas equipped with a sprinkler system on the First Floor are the Kitchen and the State Patrol Monitoring Office on the east side of the building.

Recommendation:

- All restoration work should be in keeping with the historic status of the Executive Residence.
- If possible, install a fully automatic sprinkler system throughout the First Floor spaces, where not currently provided. The installation should be sensitive to the historic status of the Executive Residence.

Stairs and Ramps

It was reported that the Grand Stairway railings do not meet code requirements for the minimum height requirements. However, the Grand Stairway railings are likely exempt due to the building's historic status.

The top of the railings in the southeast stairway are too low in height. The top of the handrail above the stair nosing is approximately 29 inches (see Fig. 2.1.B.2). According to Section 1013.3.3 of the IBC (2012) and Section R311.5.6.1 of the IRC (2012), handrail, or guardrail, height, measured vertically from the sloped plane adjoining the tread nosing, shall be not less than 34 inches and not more than 38 inches. However, these issues may be exempt due to the building's historic status.

The paving along the front edge of the patio on the southeast side of the First Floor Palm Room is spalling and cracking and is causing the railings to become loose (see Fig. 2.1.B.3, Fig. 2.1.B.4, and Section 2.1-A Exterior Building Envelope/Site). The railings at the exterior stairway leading to the southeast service entrance were observed to be corroding, especially at the posts, and may be causing the railing system to loosen (see Fig. 2.1.B.5). According to Section 1012.1 of the IBC (2012), handrails for stairways and ramps shall be adequate in strength and attachment in accordance with Section 1607.8.

Fig. 2.1.B.2 The height to the top of the handrail measured above the stair tread nosing in the southeast interior exit stairway.

Fig. 2.1.B.3 Spalling and cracking paving at the patio on the southeast side of the First Floor Palm Room.

Fig. 2.1.B.4 Spalling and cracking paving at the patio on the southeast side of the First Floor Palm Room.

Fig. 2.1.B.5 Corroding railing posts at the exterior stairway of the southeast service entrance.

Recommendations:

- All restoration work should be in keeping with the historic status of the Executive Residence.
- If allowed per historic designation guidelines, rework the existing southeast interior exit stairway to comply with code requirements including replacing or reworking the existing guardrail system throughout the stairway to comply with code requirements.
- Repair the spalling and cracking paving at the patio on the southeast side of the First Floor Palm Room and reattach the railing posts to provide a secure handrail per code requirements.
- Replace the corroding railings at the southeast service entrance to prevent damage to the stairway. Clean and repair any damage to the stairway prior to securely installing the new railing system.

Doors

The vast majority of the interior doors throughout the building are equipped with knob-style door handles (see Fig. 2.1.B.6 and Fig. 2.1.B.7). According to Section 309.4 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 further states that the force required to activate operable parts shall be 5.0 pounds (22.2 N) maximum. However, these knob-style handles may be exempt due to the building's historic status. Possible non-historic areas of the building, such as the basement,

the personnel office area on the east side of the building between the First and Second Floors, and the personal living quarters on the Second and Third Floors, should be reviewed and considered for new lever-style door handles.

It was reported that the door hardware consists of old Corbin locks and many need to be replaced.

Fig. 2.1.B.6 Typical metal knob-style door handle found throughout the building.

Fig. 2.1.B.7 Typical glass knob-style door handle found throughout the building.

Recommendations:

- All restoration work should be in keeping with the historic status of the Executive Residence.
- Replace all knob-style handles on the interior doors with lever-style handles if allowed per historic designation guidelines.
- Replace the old Corbin locks on the doors as necessary.
- If historic designation guidelines prevent the replacement of knob-style handles on the interior doors with lever-style handles, determine if any areas such as the basement, personnel office area on the east side of the building between the First and Second Floors, and the private living quarters on the Second and Third Floors are exempt and could receive accessible door handle upgrades. Any new hardware should be compatible with the style of hardware throughout the rest of the building.

Security

The grounds of the Executive Residence are entirely enclosed by a gated fence and brick walls. Metal spikes and a security grill were observed along the top of the brick perimeter walls in a few locations. There is security located on-site including a video command center. There is a State Patrol Monitoring Office located on the east side of the building adjacent to the accessible entrance. There is a Trooper Down Room located on the Basement Floor. Various security cameras and detection devices were observed throughout the Basement and First Floor of the building (see Fig. 2.1.B.8, Fig. 2.1.B.9, and Fig. 2.1.B.10). There was a security device observed on the exterior side of a window during the site survey visit (see Fig. 2.1.B.11).

It was reported that there have been issues with the intercom working properly at the two gates, one of which is located on the north side of the property along East 8th Avenue and one of which is located on the east side of the property along Pennsylvania Avenue. It was reported that there is a planned installation of a new intruder alarm system throughout the Executive Residence.

Fig. 2.1.B.8 Security alarms and detection devices observed on either side of the Front Door on the north side of the building at the First Floor.

Fig. 2.1.B.9 A security camera observed in the Grand Hallway on the First Floor.

Fig. 2.1.B.10 A security device observed at a window along the east side of the Basement Floor.

Fig. 2.1.B.11 A security device observed on the exterior side of a window.

2.1-C GENERAL ACCESSIBILITY ISSUES

The Executive Residence has a generally accessible entrance located on the north end of the east side of the building. This complies with Section 3411.9.3 of the IBC (2012) which states that at least one main entrance to an historic building shall be accessible. Otherwise, the Executive Residence is a generally non-accessible building. As a detached one-family dwelling, the Executive Residence and its accessory structures and associated sites and facilities are not required to be accessible according to Section 1103.2.4 of the IBC (2012). However, the majority of the First Floor is open to the public for State events and there are areas that serve as office space for personnel such as the State Patrol Monitoring Office, the Trooper Down Room, and the personnel offices on the east side of the building between the First and Second Floors. It was noted that there does not appear to be a restroom facility on the First Floor. These areas should be reviewed and considered for accessible upgrades, including an accessible restroom, if allowed per historic designation guidelines.

Note: As an historic property, the Executive Residence and surrounding grounds and accessory structures should comply with the Secretary of the Interior's Standards for the Treatment of Historic Properties and the National Park Service (NPS) Preservation Briefs.

2.1-D ELEVATORS

It is our understanding that there are no elevators at the Executive Residence or Carriage House.

2.1-E ENVIRONMENTAL

It was reported that there is asbestos-containing thermal system insulation (TSI) on many of the pipes in the attic above the First Family's kitchen. It was also reported that there may be asbestos in the soil of the crawl space under the kitchen area of the Carriage House and that this soil is currently covered with plastic sheeting.

It was reported that the exterior wood trim may have been painted with paint containing lead. Based on the construction date of the building, it is possible that surfaces are painted with paint containing lead.

Recommendations:

- Test the Executive Residence and Carriage House thoroughly for asbestos and abate all asbestos throughout as necessary.
- Based on the construction date of the building, sampling for lead paint must be completed if any painted surfaces will be sanded.

2.1-F PLANNED AND ON-GOING PROJECTS

It was reported that a group has volunteered to repair or replace and scrape and repaint the wood trim around the exterior of the building.

It was reported that the installation of a new intruder alarm system is

planned for the Executive Residence.

It was reported that a 5-phase restoration and rehabilitation of the Executive Residence is on the Capitol Complex list of controlled maintenance projects that need to be addressed.

The Governor's Residence Preservation Fund reports that an historic structure assessment was completed in 2010 by preservation specialists. It was reported that the first phase of the work began in 2012 and is focused on the repair of a crumbling exterior wall and grand entry gate, damaged dormer windows at the Carriage House, and re-grading work around the foundation of the Executive Residence. It was reported that the site perimeter walls with the brick colonnade retaining wall and wrought iron fencing are presently undergoing rehabilitation, section by section.

It was reported that the historic structure assessment and other projects by the Governor's Residence Preservation Fund should be reviewed and coordinated with the Capitol Complex.

Note: As an historic property, the Executive Residence and surrounding grounds and accessory structures should comply with the Secretary of the Interior's Standards for the Treatment of Historic Properties and the National Park Service (NPS) Preservation Briefs.

2.2 STRUCTURAL

2.2-A EXTERIOR BUILDING ENVELOPE

The building's exterior is in good condition with a few exceptions.

Mortar joints at the north side's main entry's stone blocks were failing (Fig. 2.2.A.1). Also, the western side of the stairs at the north entry appear to be settling away from the stone blocks (Fig. 2.2.A.1).

Fig. 2.2.A.1

Although it is unknown if the exterior columns at the north side's main entry are entirely structural, or merely architectural wraps, there is some weathering and peeling of the coatings at the column bases (Fig. 2.2.A.2). These finishes are allowing water to penetrate into the substrate, and may be causing deterioration of the structure beyond.

Fig. 2.2.A.2

Portions of concrete at the building's western patio area appear to be failing, either by poor mix design, possible poor patching in the past, or freeze and thaw cycling (Fig. 2.2.A.3 and Fig. 2.2.A.4). At least one area was able to be powdered by finger-pressure abrading.

Fig. 2.2.A.3

Fig. 2.2.A.4

Finishes at wood framing around windows were showing signs of age and deterioration of finishes. This deterioration will allow water to penetrate the building materials and cause further deterioration and possible structural damage (Fig. 2.2.A.5).

Fig. 2.2.A.5

There was evidence of past water saturation of some concrete elements at the building's southern side, likely from an old irrigation system (Fig. 2.2.A.6). The concrete surface appeared brittle at the discolored region.

Fig. 2.2.A.6

The concrete and pavers at the southeast patio area show evidence of possible soil movement and/or water damage from freeze and thaw cycling, particularly at mortar joints (Fig. 2.2.A.7 and Fig. 2.2.A.8).

Fig. 2.2.A.7

Fig. 2.2.A.8

The guardrail anchorage at the southeast patio is also showing evidence of distress (Fig. 2.2.A.9).

Fig. 2.2.A.9

Anchorage of a steel security grill at a concrete block at the southeast patio corner appears to have failed (Fig. 2.2.A.10).

Fig. 2.2.A.10

The radial concrete site retaining wall at the building's southern lawn has multiple cracks at its exterior face (Fig. 2.2.A.11 and Fig. 2.2.A.12). The cracks may be related to insufficient reinforcing quantity or spacing in the concrete, or unanticipated loading behind the wall due to surcharge loadings (such as water retention).

Fig. 2.2.A.11

Fig. 2.2.A.12

A diagonal crack was observed in the brick entry from the building's east side to the southern lawn (Fig. 2.2.A.13 and Fig. 2.2.A.14). The crack may be due to differential settling of the perpendicular brick walls. Aside from a potential for water penetration and subsequent deterioration of the brick and mortar, the crack is not structurally concerning.

Fig. 2.2.A.13

Fig. 2.2.A.14

Anchorage of a guardrail at the building's eastern side is corroding (Fig. 2.2.A.15).

Fig. 2.2.A.15

The guardrail anchorage at the entry ramp at the building's eastern side appear to utilize a embedded steel plate with minimal concrete cover. The concrete covering these anchorage points is spalling and falling away, providing a potential catch point for water (Fig. 2.2.A.16).

Fig. 2.2.A.16

Decorative wooden rail elements at the northern awning, accessible from the second floor, are deteriorating, likely from water penetration (Fig. 2.2.A.17).

Fig. 2.2.A.17

An approximately twenty foot long portion of brick wall adjacent to the visitor's center at the property's southeast corner has evidence of severe lateral movement, approaching structural failure (Fig. 2.2.A.18 and Fig. 2.2.A.19). We were not allowed to observe the wall at the interior side (from the visitor's center). The cause of the movement was unknown.

Fig. 2.2.A.18

Fig. 2.2.A.19

Some flashing and sealant failures were observed at the roof (Fig. 2.2.A.20).

Fig. 2.2.A.20

Recommendations:

- Exterior mortar joints at stone blocks should be repointed to address potential water penetration. The brick mortar joints did not appear to need maintenance at this time.
- The steps at the north entry should be monitored for additional movement.
- Exterior painted surfaces should be cleaned and repainted to address potential water penetration where cracks and peeling are occurring. Severely deteriorated wooden elements may need to be fully replaced.
- Cracks and powdering concrete, where observed, should be routed and sealed or removed and replaced with sound patching material to prevent water from penetrating the concrete and causing additional deterioration.
- Where it has been observed, anchorage of guardrails should be cleaned of corrosion and coated with exterior paint or replaced with galvanized steel elements to prevent further corrosion and deterioration.
- The steel security grill at the southeast patio should be reanchored.
- The radial concrete wall at the southern lawn should be further investigated for potential water retention issues.
- The brick wall adjacent to the visitors center should be demolished and rebuilt plumb. The new portion of wall should be designed by a registered professional engineer.
- Failed sealants at the roof should be removed and replaced.

The items noted above do not pose any structural loading issues based on the observed current use of the building and property. Recommended repairs are intended to maintain performance and reduce future deterioration.

2.2-B BUILDING INTERIOR

The overall condition of the structural framing that was readily observable is in good condition. A few areas at the third floor and in the basement have evidence of potential maintenance issues, but nothing structurally concerning.

The upper floor has some cracking of plaster and lath finishes, typically at reentrant corners of dormer windows and roof hip lines (Fig. 2.2.B.1).

Fig. 2.2.B.1

An eastern concrete wall in the basement has evidence of water penetration and permeation of the concrete. Finishes are bubbling and peeling away from the concrete at the height of the exterior grade (Fig. 2.2.B.2).

Fig. 2.2.B.2

Recommendations:

- Monitor cracks in the third floor's plaster and lath finish for changes and water damage. If water damage or additional cracking is observed, exploratory demolition could be performed to determine the underlying cause and develop repairs.
- Address water drainage issues at the building's eastern edge to remove the potential for continued penetration and deterioration of the concrete in the basement wall as noted in Fig. 2.2.B.2.

The items noted above do not pose any structural loading issues based on the observed current use of the building and property. Recommended repairs are intended to maintain performance and reduce future deterioration.

2.2-C FALL PROTECTION

The main roof has some permanent fall protection anchorage installed (Fig. 2.2.C.1), however, it appeared there were not sufficient anchorage points to access the entire roof. No anchorage points were observable at the uppermost flat roof portion.

Fig. 2.2.C.1

Inadequate parapet heights were observed at the roof (Fig. 2.2.C.2) and patios (Fig. 2.2.C.3). Some areas of roof may be accessible with fall

protection anchors already installed on the upper roof, but an access plan should be prepared and provided to any personnel accessing these roofs. Alternatively, parapets should be at least 42 inches tall for access near the exposed edges to meet current safety codes.

Fig. 2.2.C.2

Fig. 2.2.C.3

Skylights at the patio level accessible from the second floor are unprotected, and should either be verified as rated for personnel traffic or protected by guardrails (Fig. 2.2.C.4).

Fig. 2.2.C.4

Recommendations:

- Document the existing fall protection measures on the building roof to determine the system's adequacy and code compliance.
- Design and install additional fall protection systems for safe access near exposed edges at the lower patios and adjacent to skylights if necessary.

2.2-D PLANNED AND ON-GOING PROJECTS

N/A

2.3 CIVIL

2.3-A EXTERIOR BUILDING ENVELOPE/SITE

General

The Colorado Executive Residence is located at the southeast corner of 8th Avenue and Logan Street with an address of 400 East 8th Avenue in Denver, Colorado. The historic residence is bordered by an office building to the north, a parking lot to the west, commercial buildings to the south and Governors Park to the east. The Colorado Executive Residence and Carriage House site is approximately 1.68 acres with a 0.5 acre parking lot. The existing site consists of the main three-story home, rear Carriage House structure, lush and elaborate site landscaping, a small parking lot, retaining walls, and street right-of-way including sidewalk and landscaping. The main residence entrance is accessed via stairs on the north facing 8th Avenue (Fig. 2.3.A.1). The site surrounding the building is well maintained and has been improved over the course of the 105 years since the initial construction.

NOTE: Descriptions of existing infrastructure contained herein are based on public utility information provided by the City and County of Denver. Unless noted otherwise, no detailed survey information was reviewed as part of this site analysis. Estimates of drainage patterns, site grades, and slopes are based upon visual observation or information provided by others, ie. Google Earth.

Figure 2.3.A.1 – Colorado Executive Building North Entrance

Grading and Drainage

The site slopes generally from north to south. The high point of the site is to the northwest at the intersection of 8th and Logan. Runoff is collected by numerous inlets on site and conveyed north by storm sewer to East 8th Avenue.

The main entrance to the building is located on the north side and is accessed via stairs. There is an additional entrance on the east side, which has both stairs and has a ramp designated for ADA accessibility (Fig. 2.3.A.2 and Fig. 2.3.A.3). The perimeter of the structure features mostly hardscape with some areas of landscaping and mulch.

The foundation of the building appears to be stable. No signs of settlement were observed.

Figure 2.3.A.2 – Building East Entrance

Figure 2.3.A.3 – Wheel chair accessible ramp to east entrance

The site is located in the Denver Storm Drainage Master Plan Basin 4600-02 (Cherry Creek Mall). This basin consists of 4.58 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 major drainage issues. Minor drainage issues appear to be occurring along the large fountain retaining wall in the site grounds.

Utility Services

The building utility demands are unknown at this time. The building service line appears to connect to a 10 inch water main located in Logan Street which connects to a 16 inch line located in East 6th Avenue. There are two fire hydrants located near the building. One is located on the southwest corner of the site and the other on the southeast corner. There are no known water pressure problems at this time.

The residence and Carriage House is served by an 8-inch sanitary sewer line connecting to a 10-inch sanitary sewer main north of the site. Sanitary sewer is routed southerly at an estimated slope between 3 and 4 percent towards East 7th Avenue. There are no known sanitary sewer capacity problems at this time.

Existing storm sewer collects site runoff from several local area drains located on site. Based on site grades and basin boundaries it is assumed that these drain lines run south and connected to the storm sewer located in East 7th Avenue. Runoff is routed east through East 7th Avenue via a 12-inch storm sewer to a 15-inch storm line.

Existing dry and regulated utilities (electric and telecommunications) are assumed to be located in Logan Street and/or 8th Avenue.

Site Paving

The site paving was generally noted to be in good condition. A few locations of broken concrete and concrete cracking were observed. Large

cracks through walking paths can create tripping hazards. Repair or replace broken or cracked concrete.

Figure 2.3.A.4 – Site Concrete Crack

Figure 2.3.A.5 – Site Concrete Crack

Figure 2.3.A.6 – Broken Site Concrete, Recommended for Replacement

Recommendations:

- Cracks approximately 1/8 inch 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. The site appears to comply with current standards for entrance accessibility.

Site slopes were analyzed for drainage and ingress and egress. The slopes around the edge of the building appear to generally meet typical geotechnical recommendations and standard practice of 10:1 for 10 feet and 2% in hardscape areas. Some locations of flat landscaped areas surrounding the foundation were observed but they did not appear to be having any adverse impacts to the structure. However, there are several locations in the back lawn where there is no drainage path for water, specifically at the large concrete retaining wall for the fountain. Several locations of cracking along the wall were observed. The cause for the cracking is likely due to standing water (Fig. 2.3.B.1). Refer to the previously conducted Wall Report for further analysis of drainage in this area. Storm drains may need to be installed to keep water from collecting near the wall.

Figure 2.3.B.1 – Retaining Wall Cracking

Figure 2.3.B.2 – Retaining Wall Cracking

Figure 2.3.B.3 – Retaining Wall Cracking

Figure 2.3.B.4 – Broken Pillar Base

Recommendations:

- Correct drainage in south lawn and install drains.

2.3-C PLANNED AND ON-GOING PROJECTS

It is our understanding that the Colorado Executive Residence has several on-going projects for general maintenance and site improvements. It was reported that new roof drain lines are being installed which will improve the drainage conveyance and further protect the existing site.

2.4 MECHANICAL, ELECTRICAL, AND PLUMBING

2.4-A OVERVIEW OF EXISTING SYSTEMS

ELECTRICAL SYSTEMS

The electrical systems in the Executive Residence and Carriage House are in good working order. The Xcel transformer is located on the outside of the south wall (see Fig. 2.4.A.1 and Fig. 2.4.A.2). It appears to be a 75kVA transformer feeding 312 amps, 240/120 volts to each building. It is unclear the exact voltage because some panels are labeled 208/120 and others are labeled 240/120. There are panelboards throughout the building from the basement to top level. Some of the panelboards are over 25 years old and should be updated.

There is also an emergency generator to provide backup power for the building (see Fig. 2.4.A.3). On top of the carriage house and the pump house is a photovoltaic system (see Fig. 2.4.A.4). This power appears to feed directly into the grid.

Fig. 2.4.A.1 – Utility transformer

Fig. 2.4.A.2 – Utility meters

Fig. 2.4.A.3 – Emergency generator

Fig. 2.4.A.4 – Photovoltaic system map

Recommendations:

- All panelboards past their useful life should be replaced including the wire feeding the panelboard.

Lighting

The lighting system throughout the building consists of a combination of historic decorative luminaries and modern linear fluorescent luminaries (see Fig. 2.4.A.5, Fig. 2.4.A.6, and Fig. 2.4.A.7). Some of the historic luminaire bulbs were burned out. Replacing these with new LED retrofit bulbs, if available with the correct temperature, color, and will save on energy and maintenance costs. The luminaries appear to be well maintained and are in good condition. No automatic occupancy controls were observed.

The exterior luminaries in the grass areas are LED (see Fig. 2.4.A.8) and in

good working order. The building's exterior luminaries are metal halide type and in fair working order (see Fig. 2.4.A.8). These could be replaced with LED fixtures to save on energy cost and maintenance cost.

The exit signs appear to be in good condition (see Fig. 2.4.A.10). Emergency lighting is provided by the backup generator. It appears to back up all power to both buildings.

Fig. 2.4.A.5 – Linear fluorescent luminaire

Fig. 2.4.A.6 – Historic luminaire

Fig. 2.4.A.7 – Historic chandelier

Fig. 2.4.A.8 – LED exterior luminaire

Fig. 2.4.A.9 – Metal halide external luminaire

Fig. 2.4.A.10 – Exit sign

Recommendations:

- The luminaries in this building are in good working condition. Addition of automatic controls is recommended throughout the building. This would conserve energy in most of the spaces. Some of the older non-historic luminaries could be updated with LED luminaires to save energy and maintenance costs.

Fire Alarm

The fire alarm system appears to be a newer Notifier system with full detection, pull stations, and duct smoke detection (see Fig. 2.4.A.11, Fig. 2.4.A.12, and Fig. 2.4.A.13). The devices look newer and in good working order.

Fig. 2.4.A.11 – Fire alarm pull station

Fig. 2.4.A.12 – Fire alarm control panel

Fig. 2.4.A.13 – Fire alarm system

General Power

Receptacles appear to be in good working order for the most part (see Fig. 2.4.A.14). There are a few older style receptacles throughout the building.

Fig. 2.4.A.14 – Receptacle

Electrical for Mechanical System

The mechanical systems in both buildings are typical for a residence with the exception of the new geothermal heat pump system.

MECHANICAL SYSTEMS

The HVAC system in the Executive Residence consists of a geothermal distributed heat pump system (see Fig. 2.4.A.16). Supplemental heat for the heat pump system is provided via two gas fired Munchkin make boilers (see Fig. 2.4.A.17). Gas fired furnaces are provided as back-up heat in case heat pumps are unable to meet heating load. The heat pumps and furnaces are located in the basement, first floor and attic. The furnaces have sealed combustion. The heat pump system was installed about three years ago. The working condition of the heat pumps and furnace is good. The furnace rooms are being used as storage spaces (see F2.4.A.31); enough clearance for maintenance is not available. This may also be a fire hazard.

The air distribution in the spaces from the furnace is via supply and return ductwork with ceiling or wall mounted grilles and diffusers. Each heat pump and furnace is controlled via a wall mounted thermostat in the zone (see Fig. 2.4.A.15, Fig. 2.4.A.18, and Fig. 2.4.A.19). Each zone has operable windows for outside air.

There is a commercial grade kitchen on the first floor (see Fig. 2.4.A.20). A Type-I exhaust hood with fire suppression system is provided for the gas stove (see Fig. 2.4.A.21). There are two walk-in coolers located in the kitchen (see Fig. 2.4.A.22). The condensing unit for these coolers is located in the basement.

The building is fully sprinklered (see Fig. 2.4.A.23) and has a separate fire and domestic water entry. The attic is provided with a dry pipe sprinkler system. The domestic hot water is generated via two gas fired hot water heaters located in the basement (see Fig. 2.4.A.24). The plumbing system appears to be satisfactory. The water mains don't have any isolation valves. Some floor drain covers need to be replaced due to excessive corrosion (see Fig 2.4.A.28). Some clean outs are not accessible as they are covered with sheet rock. A residential type washer and dryer are installed in the basement. The dryer is vented to the outside via an aluminum flexible duct (see Fig 2.4.A.27).

Some of the controls in the building are wireless. It was noted that these controls sometimes don't work there by causing heating and cooling problems.

Perimeter zones of the building are provided with hot water baseboard for heating (see Fig. 2.4.A.25). The condition of the baseboard heaters appeared to be satisfactory. A small kitchenette is provided on the second floor which has a residential cooking stove; dishwasher and refrigerator (see Fig. 2.4.A.26). No hood is provided for the cooking stove.

Carriage House

The site survey of the Carriage House was limited to only the mechanical room since the building was occupied. The HVAC system consists of DX gas fired furnaces (see Fig. 2.4.A.29). The furnaces have sealed combustion. The building has a separate domestic water entry and domestic hot water is generated by a gas fired heater (see Fig. 2.4.A.30). Due to the limited site survey, it could not be verified if the building is sprinklered. The building is provided with operable windows to meet outside air ventilation requirement.

Fig. 2.4.A.15 – Furnace in basement

Fig. 2.4.A.16 – Geothermal heat pumps

Fig. 2.4.A.17 – Munchkin boiler

Fig. 2.4.A.18 – Furnace

Fig. 2.4.A.19 – Furnace in attic

Fig. 2.4.A.20 – Kitchen exhaust hood

Fig. 2.4.A.21 – Fire suppression for kitchen hood

Fig. 2.4.A.22 – Walk-in cooler

Fig. 2.4.A.23 – Sprinkler piping

Fig. 2.4.A.24 – Domestic water heater

Fig. 2.4.A.25 – Baseboard radiation

Fig. 2.4.A.26 – Residential stove and dishwasher

Fig. 2.4.A.27 – Dryer vented to outside

Fig. 2.4.A.28 – Floor drain cover rusted

Fig. 2.4.A.29 – Furnace

Fig. 2.4.A.30 – Domestic water heaters

Fig. 2.4.A.31 – Equipment storage around furnace

Recommendations:

- The HVAC system for the Executive Residence appears to be in good working condition. Most of the mechanical rooms are being used as storage spaces. Space required around the unit for maintenance is not per manufacturer's recommendation. It is recommended to provide enough maintenance space around the units.
- Replace wireless controls with wired controls for better equipment control.
- Plumbing fixtures, such as floor drain covers etc. are rusted and need to be replaced. Also provide isolation valves on the water mains.
- Provide access panel for plumbing clean outs.

2.4-B CODE ISSUES

ELECTRICAL CODE ISSUES

It appears that some of the receptacles by open water sources are not GFI protected (see Fig. 2.4.B.1 and Fig. 2.4.B.2).

There are water lines and coolant lines mounted above an electrical panel (see Fig. 2.4.B.3).

Some of the panelboards are labeled with the wrong voltage.

Fig. 2.4.B.1 – Receptacles without GFI protection

Fig. 2.4.B.2 – Receptacle without GFI protection

Fig. 2.4.B.3 – Water and coolant lines above panel

Recommendations:

- All the panels are required per code to have the correct voltage label. Update all the labels with the accurate voltage.
- Ensure receptacles by open water sources are GFI protected.

MECHANICAL CODE ISSUES

There were no mechanical code issues observed.

2.4-C PLANNED AND ON-GOING PROJECTS

No projects have been reported at this time.

2.5 VOICE AND DATA

2.5-A OVERVIEW OF EXISTING SYSTEMS

Findings

Note SMW was not scoped for this task, for this building or the remaining building assessments. SMW provided voice/data survey and assessment scope for the Capitol Annex Building (1375 Sherman Street) and the Centennial Building (1313 Sherman Street) only.

Recommendations:

The recommendations and guidelines within this section shall establish the Basis of Design for the IT Infrastructure portion of the renovation of the Executive Residence and Carriage House.

The facilities should be provisioned with the following pathways, spaces and cable media.

Telecommunications Closets (i.e. Spaces)

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

- One consolidated Main Equipment Closet (MDF) / Entrance Facility (EF) shall be provided within the facility.
- This main MDF will include both the facility entrance point location for supporting outside plant cabling, and will be the main equipment closet for installation of the telecommunications systems' head end equipment.
- The MDF closet should be installed on the first floor of the facility. Avoid the basement due to potential flooding.
- The MDF closet shall be sized appropriately, to be capable of supporting the installation of electronics equipment, as determined during the design phase.

2. Telecommunications Closets (IDFs)

- A minimum of one (1) telecommunications IDF closet should be

installed on each floor and should be vertically stacked floor-to-floor, if possible. Facilities with larger floor plates may require a 2nd IDF closet per floor.

- The IDF closets shall be sized appropriately, to be capable of supporting the installation of electronics equipment, as determined during the design phase.

3. Telecommunications Closet Location

- TIA Standards requires one IDF closet per floor and it shall be located as close as possible to the center of the area being served.
- Additional IDF closets 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 closets should not share a common wall with an electrical room due to potential electromagnetic interference (EMI) issues. If these spaces do exist adjacent to one another, 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 closet to each IDF closet within the facility.
- Appropriate vertical and/or horizontal conduit sleeves must be provided in with MDF/IDF spaces, to provide usable low-voltage cable pathways from the space.

2. Horizontal Pathways

- Telecommunications cabling pathways will need to be installed from telecom outlets and IP field devices to the IDF closet serving the floor.
- Horizontal cabling may be installed in accessible ceiling space, or in conduit, as applicable to construction application.
- For facilities designated as historic buildings, alternate cable routing may require the use of surface mounted conduit and wireways,

to comply with historic preservation codes. In these cases, the cable installation design must be coordinated with the State prior to construction.

- At the telecom outlet locations, provide 4" square back boxes that are 2-1/8" deep with a 1" conduit installed within the wall to the nearest accessible ceiling space, for routing cabling to cable tray.
- If outlets need to be surface mounted then provide 1" surface mounted raceway (or wiremold) from the surface back-box to the main telecom distribution pathways.

Telecommunications Cabling

1. Telecommunications Backbone Cabling

- During design phase, requirements for backbone cabling between MDF and IDF location(s) will need to be reviewed and determined. Backbone cabling may include fiber optic media and/or copper cabling backbone, dependent upon incoming communication services and bandwidth requirements. If required, multimode fiber optic backbone cabling should be OM4 50 micron laser optimized optical fiber.

2. Telecommunications Horizontal Cabling

- Telecom outlets and IP field device locations should be provided with Category 6 unshielded, twisted pair (UTP) horizontal cable routed to the termination hardware in MDF/IDF closet.

3. Cabling within Admin/Office Areas

- Desk station locations with admin/office areas should be provided with a minimum of two telecommunications outlets. Network cabling should be Category 6 unshielded, twisted pair (UTP) horizontal cable routed to the termination hardware in MDF/IDF closet.

4. Wireless Access Points (WAPs)

- Ceiling mounted WAPs should be provided with two Category 6 horizontal cables to each WAP from the IDF closet serving the area.
- Provide WAP network outlets at 200 foot centers on each floor, mounted in accessible ceilings.

2.5-B CODE ISSUES

Findings

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

Recommendations:

For new renovation work, codes which would be applicable would include buy 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 Executive Residence and Carriage House currently.

2.6 SECURITY SYSTEMS

2.6-A OVERVIEW OF EXISTING SYSTEMS

Findings

Note: SMW not scoped for this task, did not provide survey work for Security.

It was reported that Hirsch access control card readers need to be upgraded.

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 measures for the Executive Residence and Carriage House. The purpose of this recommendations report is to provide a description of electronic security system parameters which would provide a safe environment for the occupants of the facilites. Security systems should be designed to aid responding security personnel, and be flexible such that they may be monitored remotely from centralized security monitoring locations. The systems must further provide capability to deliver the highest quality technology today and in the future for system expansion and change. The security system design may employ various security technologies. Integrated security systems must be capable to function independently if required, as well as be monitored and controlled from a central station or CSP Central Command Center if required. This report is intended to provide valuable information to both technical and non-technical readers for ongoing coordination with security program requirements.

Recommended electronic security systems to be considered for implementation and/or upgrade include intrusion detection, duress alarm, intercom, and video surveillance system. These applications make it possible for security responders to monitor alarms and view activity at critical areas on the property from a central monitoring location or a network-connected security workstation at another location. Care shall be taken to ensure that critical exterior areas will be properly monitored for activity. Electronic security control and monitoring applications shall be implemented as appropriate to secure the facilities 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 building:

- Industry Standard / Best Practice Design
- Crime Prevention through Environmental Design (CPTED)
- Layered Security / Concentric Circles of Protection
- Integrated Design – Physical/Electronic/Operational
- State of Colorado Design Standards, as applicable

The video surveillance system (VSS) will implement IP digital HD type cameras integrated with the existing state 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 the network. 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 network switches, providing IP connectivity. 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 facilities, for staff use in emergency situations. The duress system will utilize 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 facility should incorporate this

technology, and be monitored by the existing CSP head-end system.

An Intercom Communication System (ICS) should be implemented to enhance security operations in the facility, and provide convenience for staff and visitors. It is recommended that an Intercom over IP (IoIP) Communications solution be used for this application. An 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 network via IP communications. Staff at the intercom master station would be provided with two-way audio communications to any remote IP intercom sub-station.

An intrusion detection system (IDS) will monitor facility entry points and windows for intrusion, when alarmed. Interior motion detectors may also be implemented to enhance alarm capabilities within interior zones. Arming keypads should be located adjacent to designated primary entry points. New IDS equipment would be located in equipment closets. Alarm device additions and modifications shall be coordinated with State during the design phase. The IDS should be monitored either by a central monitoring station, or by CSP central command center.

Within the building, new head-end security control equipment should be located in technology equipment closets, as coordinated with State IT technical staff. Equipment may include IDS panels, power supplies, duress alarm panels, and network video recorders. Electronic security equipment must be backed-up with UPS units. State security personnel and other authorized staff may remotely monitor system alarms and security video through network connected client workstations. For 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 by a central monitoring station, and also 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 Executive Residence and Carriage House shall be an extension of existing State facility security system infrastructure, as appropriate. It is generally recommended that the facilities be provided with electronic security applications and equipment as listed below:

Intrusion alarms:

- Perimeter doors
- Ground level windows which are accessible
- Motions alarms from exterior cameras

Intercom stations:

- Facility visitor entries
- Perimeter man gate, vehicle gate

Wireless duress alarms:

- Administrative/office areas
- Public reception locations
- Other, as TBD

Video surveillance cameras:

- Facility entry points
- Facility exteriors
- Perimeter fence entry points
- Perimeter fence lines

Security system cabling should generally share cable routes with that of other low-voltage and network cabling system. For facilities designated as historic buildings, alternate cable routing may require the use of surface mounted conduit and wireways, to comply with historic preservation codes.

In these cases, the cable installation design must be coordinated with the State prior to construction. 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. 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 other trades, and be properly separated from parallel runs of any electrical circuiting.

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 or surface wiremold.
- 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 technology equipment closets. Final locations should be coordinated with State IT technical staff during design phase. This equipment may include intrusion alarm panels, wireless duress equipment, power supplies, and network video recorders. Specific requirements and locations within the facilities will be determined during the design phase. All security equipment in the closet should be located away from potential sources of electro-mechanical interference (EMI). In the event of loss of power, 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)
- 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 Executive Residence and Carriage House currently.

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3.0 FLOOR-BY-FLOOR ASSESSMENT FINDINGS AND RECOMENDATIONS

3.0-A CODE ISSUES

See 2.1-B Code Issues

3.0-B GENERAL ACCESSIBILITY ISSUES

See 2.1-C General Accessibility Issues

3.0-C ARCHITECTURAL FINISHES AND INTERIOR COMPONENTS

General Architecture Findings

The Executive Residence, also known as the Governor's Residence at the Boettcher Mansion, was added to the U.S. Register of National Historic Places on December 3, 1969, and includes a collection of furnishings and artwork acquired by the former owners of the residence. The main entrances to the Executive Residence lead to the First Floor and include the Front Entrance on the north side of the building and an accessible entrance on the east side of the building. The Front Entrance opens into the Grand Hallway, a broad and columned corridor featuring ornate 18th century French chandeliers along with artwork and furnishings from around the world. The Grand Hallway runs north-south and terminates at the Palm Room on the south side of the building. The Palm Room opens to the Small Dining Room on the east side and the Well Room on the West Side. The other First Floor public rooms, including the Drawing Room, Library, and Main Dining Room, are accessed off of the Grand Hallway. The historic President Grant chandelier hangs in the Drawing Room at the northwest corner of the First Floor. The grand stairway is located to the east of the Grand Hallway and south of the Family Game Room/Bar, which is located at the northeast corner of the First Floor. There is a service wing located on the

east side of the First Floor, starting south of the accessible entrance porch and leading to the service entrance at the southeast corner of the building. The First Floor service wing includes the State Patrol Monitoring Office, the Kitchen, and the Pantry.

The Second and the Third Floors of the residence comprise the private quarters of Colorado's Governor and his or her family. The Grand Stairway opens into a public Living Room at the Second Floor and a Family Room at the Third floor, with bedrooms and office spaces around the perimeter. Personnel offices exist on the east side of the building above the First Floor service wing and can be accessed from the Grand Stairway landing between the First and Second Floors or from the southeast stairway.

The Basement includes an open Ballroom on the west side of the building, a variety of storage spaces, mechanical and electrical rooms, the Trooper Down Room, a bathroom, and the Laundry Room.

It was reported that there is asbestos-containing thermal system insulation (TSI) on many of the pipes in the attic above the First Family's kitchen.

Based on the construction date of the building, it is possible that surfaces are painted with paint containing lead. Sampling for lead paint must be completed prior to sanding any surfaces to be painted.

Note: As an historic property, the Executive Residence and surrounding grounds and accessory structures should comply with the Secretary of the Interior's Standards for the Treatment of Historic Properties and the National Park Service (NPS) Preservation Briefs.

View of the Front Entry

View of the Grand Stairway

View of the President Grant chandelier in the Drawing Room

View of the Main Dining Room

View of the Palm Room, looking south from the Grand Hallway

View of the Palm Room, looking north towards the Grand Hallway

View of the Well Room

View of the Ballroom in the basement

Ceiling Finishes

The plaster ceilings, including those with plaster and wood ornamentation, throughout the First through Third Floors appear to be in generally fair condition overall.

The ceilings throughout the attic storage space on the Third Floor are in poor condition with evidence of water damage and numerous areas of cracking and spalling observed during the site survey visit (see Fig. 3.0.C.1 and 3.0.C.2).

The ceilings throughout the Basement Floor are in fair to poor condition overall with areas of peeling paint, cracking, and damage noted (see Fig. 3.0.C.3, Fig. 3.0.C.4, and Fig. 3.0.C.5).

Fig. 3.0.C.1 Water damage and spalling observed at the ceilings throughout the attic storage space on the Third Floor.

Fig. 3.0.C.2 Water damage and cracking observed at the ceilings throughout the attic storage space on the Third Floor.

Fig. 3.0.C.3 Peeling paint observed at the ceiling on the Basement Floor.

Fig. 3.0.C.4 Cracking observed at the ceiling on the Basement Floor.

Fig. 3.0.C.5 Damage observed at areas of the plaster and wood lath ceiling on the Basement Floor.

Wall Finishes

The plaster walls throughout the First through Third Floors appear to be in generally fair condition overall. The wood trim, wainscoting, and paneling throughout the First through Third Floors appear to be in generally fair condition overall. It was reported that there is a portion of wood wainscoting in the Basement Ballroom with numerous holes. The wallcovering observed in a few of the rooms throughout the First through Third Floors appears to be in generally fair condition overall. The areas of four-inch square tile wainscoting observed in a few of the restrooms appears to be in generally fair condition overall.

The plaster and wood lath walls throughout the attic storage space on the Third Floor are in poor condition overall with evidence of water damage and numerous areas of cracking and spalling observed during the site survey visit (see Fig. 3.0.C.6).

The walls throughout the Basement Floor are in fair to poor condition overall with areas of peeling paint, cracking, and damage noted (see Fig. 3.0.C.7 and Fig. 3.0.C.8). The worst of the damage was observed along the east side of the building, under and around the window wells (see Fig. 3.0.C.9, Fig. 3.0.C.10, Fig. 3.0.C.11, and Fig. 3.0.C.12).

Cracking and deterioration was noted at the brick wall in the southeast stairway at the Basement Floor (see Fig. 3.0.C.13).

Fig. 3.0.C.6 Widespread areas of water damage, cracking , and spalling observed at the walls throughout the attic storage space on the Third Floor.

Fig. 3.0.C.7 Peeling paint and cracking noted at a wall of the storage space located on the north side of the Basement Floor.

Fig. 3.0.C.8 Damage noted along the south wall of the building in the Mechanical Room on the east end of the south side of the Basement Floor.

Fig. 3.0.C.9 Wall coating observed to be cracking off of the east wall under a window in the Furnace Room at the northeast corner of the Basement Floor.

Fig. 3.0.C.10 Damage observed at the east wall and south of the window in the Basement Floor Laundry Room.

Fig. 3.0.C.11 Damage observed at the east wall and north of the window in the Basement Floor Laundry Room.

Fig. 3.0.C.12 Damage observed at the east wall of the window in the restroom located north of the Laundry Room on the Basement Floor.

Fig. 3.0.C.13 Deterioration and cracking noted at the brick wall in the southeast stairway at the Basement Floor.

Floor Finishes

The wood floors throughout are in fair to poor condition with general wear-and-tear noted overall. The wood floors throughout the First Floor were observed to be in particularly poor condition with wear-and-tear, soiling, and deterioration (see Fig. 3.0.C.14, Fig. 3.0.C.15, and Fig. 3.0.C.16). A metal valve, or control, was noted to be projecting above the floor of the Family Game Room/Bar at the northeast corner of the First Floor, creating a potential tripping hazard (Fig. 3.0.C.17). The wood floors throughout the Basement Ballroom and the Second Floor Living Room, Governor's Home

Office, and Governor's Spouse's Home Office were observed to be in fair condition overall with general wear-and-tear and areas of deterioration and warping noted (see Fig. 3.0.C.18, Fig. 3.0.C.19, and Fig. 3.0.C.20).

The marble floors throughout the Palm Room and the Small Dining Room on the south side of the First Floor are in fair to poor condition overall with areas of cracking and soiling noted (see Fig. 3.0.C.21 and Fig. 3.0.C.22). It appears that some of the soiling is likely from the planters placed throughout the room. There was an area of soiled terrazzo flooring in the Well Room that appears to be the outline of an object formerly placed in that location (see Fig. 3.0.C.23).

The carpet flooring, throughout the majority of the living spaces on the Second and Third Floor and on the Grand Stairway, is in poor condition overall with soiling and areas where the carpet is pulling loose and bunching, creating a potential tripping hazard (see Fig. 3.0.C.24 through Fig. 3.0.C.29). The area rug throughout the center of the Drawing Room at the northwest corner of the First Floor was observed to be worn and soiled (see Fig. 3.0.C.30).

The tile flooring observed in the restrooms throughout the private living quarters appeared to be in generally fair condition overall. The linoleum, or vinyl, tile flooring in the restroom serving the personnel offices on the east side of the building between the First and Second Floors was observed to be generally worn (see Fig. 3.0.C.31).

The linoleum, or vinyl sheet flooring observed throughout the kitchen area on the east side of the First Floor appears newer and in good condition overall.

The rubber flooring on the stair treads and at the landings of the southeast stairway appears to be in generally fair condition with some minor soiling noted. The paint on the stairs and railings throughout the southeast stairway was noted to be wearing off and exposing the wood in areas (see Fig. 3.0.C.32).

The wood floors throughout the attic storage space on the Third Floor are generally dirty and appear to have water stains in areas.

The concrete floors throughout the Basement Floor are in fair to poor condition throughout with cracking and worn paint observed during the site survey visit (see Fig. 3.0.C.33 and Fig. 3.0.C.34).

Fig. 3.0.C.14 Worn and soiled wood floors observed throughout the First Floor.

Fig. 3.0.C.15 Scuffed and soiled wood floors observed on the First Floor with areas of the flooring finish worn down to the bare wood.

Fig. 3.0.C.16 Damaged sections of the wood floors observed throughout the First Floor.

Fig. 3.0.C.17 A metal valve, or control, noted to be projecting above the floor of the Family Game Room/Bar in the northeast corner of the First Floor and creating a potential tripping hazard.

Fig. 3.0.C.18 General wear-and-tear noted at the wood floors in the Living Room on the Second Floor.

Fig. 3.0.C.19 Wood floors observed to be generally worn and warping in the Governor's Home Office on the Second Floor.

Fig. 3.0.C.20 General wear-and-tear observed at the wood floors in the Governor's Spouse's Home Office on the Second Floor.

Fig. 3.0.C.21 Areas of cracked and deteriorating marble flooring observed in the Palm Room on the south side of the First Floor.

Fig. 3.0.C.22 Areas of cracked, deteriorating, and soiled marble flooring observed in the Palm Room on the south side of the First Floor.

Fig. 3.0.C.23 Area of soiled terrazzo flooring observed in the Well Room at the southwest corner of the First Floor.

Fig. 3.0.C.24 Typical instance of carpet observed to be pulling loose and bunching, creating a potential tripping hazard, throughout the personal living quarters.

Fig. 3.0.C.25 Typical instance of soiled and worn carpet observed throughout the personal living quarters.

Fig. 3.0.C.26 Typical instance of soiled and worn carpet observed on the Grand Stairway.

Fig. 3.0.C.27 Typical instance of deteriorating carpet pulling loose at the seams observed throughout the personnel office spaces on the east side of the building between the First and Second Floors.

Fig. 3.0.C.28 Typical instance of soiled and worn carpet observed throughout the personnel office spaces on the east side of the building between the First and Second Floors.

Fig. 3.0.C.29 Soiled and worn carpet observed in the Trooper Down Room on the Basement Floor.

Fig. 3.0.C.30 The area rug in the Drawing Room at the northwest corner of the First Floor was noted to be worn and soiled.

Fig. 3.0.C.31 Worn linoleum, or vinyl, tile flooring in the restroom serving the personnel offices on the east side of the building between the First and Second Floors.

Fig. 3.0.C.32 Areas of worn pain noted throughout the southeast stairway.

Fig. 3.0.C.33 Cracked concrete flooring observed in areas throughout the Basement Floor.

Fig. 3.0.C.34 Worn paint observed at the concrete flooring in areas throughout the Basement Floor.

Other

The doors throughout the Basement Floor were noted to have general signs of wear-and-tear (see Fig. 3.0.C.35).

There appears to be an issue with a toilet observed in a private restroom on the Second Floor (see Fig. 3.0.C.36). It was reported that the toilet has overflowed in the past and caused damage. A handwritten note has been added to the wall above the toilet and a detector has been added at the floor under the vanity to detect flooding.

Fig. 3.0.C.35 Wear-and-tear observed at the doors throughout the Basement Floor.

Fig. 3.0.C.36 An improperly functioning toilet observed in a private restroom on the Second Floor.

Recommendations:

- All restoration work should be in keeping with the historic status of the Executive Residence.
- Test the Executive Residence and Carriage House thoroughly for asbestos and abate all asbestos throughout as necessary.
- Repair or replace the damaged plaster and lath ceilings and walls throughout the attic storage space on the Third Floor, following a complete replacement of the roof.
- Repair or replace the ceilings and walls throughout the basement with peeling paint, cracking, or other damage. Determine the cause of water damage and repair as necessary.
- Repair or replace the cracking, or otherwise damaged, brick at the walls in the southeast stairway at the Basement Floor.
- Repair or replace any damaged wood wainscoting on the walls throughout, including the damaged area of wainscoting in the Basement Ballroom.
- If possible, rehabilitate the wood floors throughout, including the Basement Ballroom, repairing or replacing any damaged areas of the floors, to match existing. If any of the wood floors do not have enough thickness remaining for a refinishing project, replace the wood floors to match existing and per historic designation guidelines.
- If possible, remove the metal valve, or control, projecting above the floor of the Family Game Room/Bar and creating a potential tripping hazard. If the metal valve, or control, needs to remain, install a code-compliant barrier around this location.
- Clean and repair or replace soiled and damaged marble flooring throughout the Palm Room and the Small Dining Room on the south side of the First Floor. All work should be in keeping with historic designation guidelines.
- Clean and refinish the terrazzo flooring in the Well Room in the southwest corner of the First Floor.
- Investigate and determine whether any soiling or damage of the stone flooring is occurring as a result of the plantings placed throughout the Palm Room, Small Dining Room, and Well Room on the south side of the First Floor and make adjustments as necessary to prevent future soiling or damage to the floors.

- Replace all carpet throughout the Second and Third Floor private living quarters, the personnel office area on the east side of the building between the First and Second Floors, the Trooper Down Room on the Basement Floor, and on the Grand Stairway.
- Clean and restore the area rugs in the rooms throughout the First Floor.
- Replace the linoleum, or vinyl, flooring in the restroom serving the personnel offices on the east side of the building between the First and Second Floors.
- Clean the southeast stairway using an approved method. Touch up the paint throughout as necessary, to match existing.
- Clean the wood floors throughout the attic storage space on the Third Floor, and add a protective coating to the floors if possible, following a complete roof replacement.
- Repair or replace any cracking, or otherwise damaged, concrete floors throughout the basement. Repaint the areas of the concrete flooring with worn and deteriorating paint, using an approved method.
- Replace the improperly functioning toilet and piping in the private restroom on the Second Floor with a new toilet and new piping as necessary.
- Refurbish the interior doors and door frames throughout the Basement Floor.
- Replace all knob-style door handles if allowed per historic designation guidelines. If historic designation guidelines prevent the replacement of knob-style handles on the interior doors with lever-style handles, determine if any areas, such as the personnel office area on the east side of the building between the First and Second Floors or any areas throughout the basement, could receive accessible door handle upgrades.

MARTIN / MARTIN CONSULTING ENGINEERS

3.0-D STRUCTURAL

No structural concerns were noted on the Basement Floor through the Third Floor. 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.

4.0 LEVELS OF RENOVATION NEEDED

Building: Executive Residence/Carriage House, 400 East 8th Avenue (Denver)					
Priority	Main System	Sub System	Level of Renovation Needed		
			Minimal	Moderate	Extensive
1	Exterior Enclosure	Roof			√
1	Interior	Finishes - Flooring			√
1	Site	Brick Perimeter Walls			√
1	Exterior Enclosure	Sealant / Grout		√	
1	Infrastructure	Power		√	
1	Site	Drainage		√	
2	Exterior Enclosure	Windows		√	
2	Exterior Enclosure	Walls		√	
2	Infrastructure	Tele/Com		√	
2	Infrastructure	Security Access/IDS		√	
2	Infrastructure	Security Video		√	
2	Interior	ADA-Door Levers		√	
2	Interior	Finishes Ceiling		√	
2	Interior	Finishes - Wall		√	
2	Site	Retaining Walls		√	
3	Exterior Enclosure	Fall Protection (roof)	√		
3	Exterior Enclosure	Doors	√		
3	Infrastructure	HVAC	√		
3	Infrastructure	Lighting	√		
3	Infrastructure	Fire Alarm	√		
3	Infrastructure	Fire Sprinkler	√		
3	Infrastructure	Structural Framing	√		
3	Interior	Doors	√		
3	Site	Pavement	√		
3	Site	Lighting	√		
	Environmental	Asbestos	(present, per Owner)		
	Code	Exit Stairways			
	Code	Exits			
	Code	Dead End Corridors			
	Exterior Enclosure	Penthouse			
	Exterior Enclosure	Signage			
	Infrastructure	Elevator(s)			
	Interior	ADA-Restrooms			
	Interior	ADA-Drinking Fountains			
	Interior	ADA-Sinks (Break Rooms)			
	Site	Utilities			

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5.0 COST ESTIMATES

SUMMARY OF SUMMARIES

Item No.	Description	SF	Total	$/SF
1	400 E. 8th Avenue - Executive Residence	31,268	6,618,494	211.67
2	Contingency on Above		w/ Above	
	Subtotals:	**31,268**	**6,618,494**	**212**
3A	IT \ Teledata (Relocate Exstg Only)	31,268	32,872	1.05
3E	Public Art	31,268	76,607	2.45
4	Contingency on Above		Excluded	
	Equipment \ Art Subtotal:		**109,479**	**4**
	Base Price \ Equipment \ Art Subtotal:		**6,727,973**	**215**
5	Escalation		Excluded	
6	Contingency on Above		Excluded	
	Escalation Subtotal:		**Excluded**	
	Base Price \ Equipment \ Art Subtotal:		**6,727,973**	**215**
7	Design Fees at 8% per State of CO Direction		538,238	17.21
8	Contingency on Above		Excluded	
	Design Fee Subtotal:		**538,238**	**17.21**
	Base Price \ Equipment \ Art \ Design Fee Subtotal:		**7,266,211**	**232**

PROJECTED COST OF CONSTRUCTION IN 2014 DOLLARS	**7,266,211**	**232**

ADD-ALTERNATE				
9	Move Management	31,268	51,505	1.65
10	Flex Space		Excluded	
11	FF&E		Excluded	
12	Escalation - 6.75% per year		Excluded	
13	Contingency on Above		Excluded	
	Subtotals:		**51,505**	**1.65**
	ADD-ALTERNATE SUBTOTAL:		**51,505**	**1.65**

SYSTEM BY SYSTEM SUMMARY

Item No.	Description	SF	Total	$/SF
1A	Replace Electric Panel Boards & Wiring	31,268	502,341	16.07
1B	Escalation to March 2017		Excluded	
	System 1 w/o Escalation Subtotal:		**502,341**	**16**
2A	Rebuild Brick Wall Adjacent to Visitors Center	31,268	198,017	6.33
2B	Escalation to March 2018		Excluded	
	System 2 w/o Escalation Subtotal:		**198,017**	**6**
3A	Repair Drainage Problems	31,268	1,197,887	38.31
3B	Escalation to March 2019		Excluded	
	System 3 w/o Escalation Subtotal:		**1,197,887**	**38**
4A	Re-tuck Point Stone & Brick	31,268	777,000	24.85
4B	Escalation to March 2020		Excluded	
	System 4 w/o Escalation Subtotal:		**777,000**	**25**
5A	Replace Roof	31,268	518,845	16.59
5B	Escalation to March 2021		Excluded	
	System 5 w/o Escalation Subtotal:		**518,845**	**17**
6A	Balance of Project Scope	31,268	4,604,609	147.26
6B	Escalation to March 2022		Excluded	
	System 6 w/o Escalation Subtotal:		**4,604,609**	**147**
	System by System w/o Escalation Subtotal:		**7,798,700**	**249**
7	IT \ Teledata (Relocate Exstg Only)		32,872	1.05
8	Public Art		76,607	2.45
9	Contingency on Above		Excluded	
	Equipment \ Art Subtotal:		**109,479**	**4**
	Systems \ Equipment \ Art Subtotal:		**7,908,180**	**253**
10	Design Fees at 8% per State of CO Direction		632,654	20.23
11	Contingency on Above		Excluded	
	Design Fee Subtotal:		**632,654**	**20**
	Base Price \ Equipment & Art \ Design Fee Subtotal:		**8,540,834**	**273**

PROJECTED COST OF CONSTRUCTION IN 2014 DOLLARS	**8,540,834**	**273**

ADD ALTERNATE				
12	Move Management	31,268	51,505	1.65
13	Flex Space		Excluded	
14	FF&E		Excluded	
15	Escalation - 6.75% per year		Excluded	
16	Contingency on Above		Excluded	
	Move Management Subtotal:		**51,505**	**2**
	Add Alternate Subtotal:		**51,505**	**2**

DETAILED ESTIMATE - SUMMARY

				31,268
Item No.	**Description**	**$/SF**	**Total**	**Total w/Burdens**
DIV 2	EXISTING CONDITIONS	12.45	389,433	641,302
DIV 3	CONCRETE	3.18	99,529	163,899
DIV 4	STONE & MASONRY	14.36	448,914	739,252
DIV 5	METALS	2.90	90,600	149,196
DIV 6	WOODS & PLASTICS	10.80	337,651	556,029
DIV 7	THERMAL PROTECTION	14.49	452,940	745,882
DIV 8	OPENINGS, DOORS, WINDOWS	7.24	226,250	372,578
DIV 9	FINISHES	39.81	1,244,667	2,049,662
DIV 10	SPECIALITIES		EXCLUDED	
DIV 11	EQUIPMENT		EXCLUDED	
DIV 12	FURNISHINGS		EXCLUDED	
DIV 13	SPECIAL CONSTRUCTION		EXCLUDED	
DIV 14	CONVEYING SYSTEMS		2,500	
DIV 21	FIRE SUPPRESSION	1.60	50,000	82,338
DIV 22	PLUMBING	1.44	45,000	74,104
DIV 23	HVAC	0.35	10,928	17,996
DIV 26	ELECTRICAL	14.23	444,939	732,706
DIV 27	COMMUNICATIONS	1.22	38,260	63,004
DIV 31	EARTHWORK		EXCLUDED	
DIV 32	EXTERIOR IMPROVEMENTS	4.40	137,500	226,429
DIV 33	UTILITIES		EXCLUDED	
DIV 34	TRANSPORTATION		EXCLUDED	
	Subtotal Direct Construction Costs	**128.54**	**4,019,112**	**6,618,494**
	Allowance for Historical / Memorial Markers		0	
	Direct Cost Subtotal with GFP	**128.54**	**4,019,112**	
	Material Testing	0.35%	14,067	
	Owner's Design & Preconstruction Contingency	10.00%	401,911	
	Owner's Construction Contingency (after NTP)	5.00%	200,956	
	Permits	1.90%	76,363	
	Total Direct Construction Costs	**150.71**	**4,712,408**	
	Standard General Conditions (GC's Onsite Overhead)		1,180,207	
	Subtotal NET Construction Cost	**188.46**	**5,892,615**	
	GC's Off-Site Overhead & Profit	8.20%	483,194	
	GC's General Liability Insurance	0.90%	53,034	
	Construction Cost w/o Bonds & Escalation	**205.60**	**6,428,843**	
	Builder's Risk Insurance	1.50%	96,433	
	Performance & Payment Bond	1.20%	77,146	
	Bid Bond	0.25%	16,072	
	Tap Fees		Excluded	
	Bidding Reserves		Excluded	
	Total Estimated Cost of Construction	**211.67**	**6,618,494**	

DETAILED ESTIMATE

Estimate By:	Kyle Hoiland
Date:	27-Apr-14
Reviewed By:	Chris Squadra
Date:	27-Apr-14

Building GSF: 31,268 **Total Cost:** $4,019,112

DIV 02	Description	Quantity	Unit	TOTALS Cost/Unit	TOTALS Total Cost
	EXISTING CONDITIONS / BUILDING DEMOLITION				
	Asbestos Abatement & Testing (Allowance)	1	LS	75,000.00	75,000
	Lead Paint Abatement & Testing (Allowance)	1	AL	75,000.00	75,000
	Demo Building Interior as needed (Allowance)	15,634	SF	4.00	62,536
	Demolition Disposal & Dumping Fees	2,895	CY	3.40	9,844
	High Pressure Wash @ Exterior Building	16,975	SF	1.40	23,766
	Clean Window Ledges (Allowance)	24	EA	250.00	6,000
	Prep Exterior Wood Components for Re-paint (Allowance)	16,975	SF	2.33	39,553
	Remove Existing Caulking at Exterior Building Joints	8,225	LF	2.50	20,563
	Scaffolding (erect & dismantle)	170	CSF	198.95	33,773
	Scaffolding Rental	6	MO	6,400.00	38,400
	Move Items / Furniture for Egress (Allowance)	1	AL	5,000.00	5,000
	SUBTOTAL EXISTING CONDITIONS/DEMOLITION				**389,433**

DIV 03	Description	Quantity	Unit	TOTALS Cost/Unit	TOTALS Total Cost
	CONCRETE / FOUNDATIONS				
	Foundation & Concrete Repair (Allowance)	1	AL	50,000.00	50,000
	Repair Concrete Cracking & Spalling @ Interior Slabs / Concrete Walls / Ceilings	10,318	SF	4.80	49,529
	SUBTOTAL FOUNDATIONS				**99,529**

DIV 04	Description	Quantity	Unit	TOTALS Cost/Unit	TOTALS Total Cost
	MASONRY				
	Exterior Cut Stone Repair & Replacement at Building, where necessary (Allowance)	4,244	SF	45.00	190,974
	Exterior Cut Stone Cleaning, Repair & Replacement at Site Walls & Stairs, where necessary (Allowance)	1,000	SF	45.00	45,000
	Exterior Brick Repair & Replacement at Building, where necessary (Allowance)	11,374	SF	11.15	126,815
	Recaulk Exterior Masonry	8,225	LF	5.00	41,126
	Historic Preservation Premium - Masonry	1	AL	45,000.00	45,000
	SUBTOTAL MASONRY				**448,914**

DIV 05	Description	Quantity	Unit	TOTALS Cost/Unit	TOTALS Total Cost
	METALS				
	Replace Exterior Metal Railing @ Service Entrance	60	LF	275.00	16,500
	Replace Interior Stair Railings & Guardrails throughout (code compliance) (Allowance)	500	LF	128.20	64,100
	Fall Protection Systems (Allowance)	1	AL	10,000.00	10,000
	SUBTOTAL METALS				**90,600**

DIV 06	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	WOODS				
	Rough Carpentry Wood Materials	31,268	SF	0.75	23,451
	Rough Carpentry Labor	400	HRS	48.00	19,200
	**Time & materials for miscellaneous building shoring, safety railings/barricades, blocking, substrate repairs*				
	Repair Damaged Wood at Exterior SE Porch & Columns	1	AL	50,000.00	50,000
	Replace Wood Railings around Flat Roof Deck to match Historic Design	100	LF	450.00	45,000
	Interior Millwork & Wood Window Prep & Repair (Allowance)	1	AL	75,000.00	75,000
	Rehabilitate the Historic Pergola @ NE Lawn (Allowance)	1	AL	100,000.00	100,000
	Reconfigure Restrooms for Accessibility (Allowance)	1	AL	25,000.00	25,000
	SUBTOTAL WOODS				**337,651**

DIV 07	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	THERMAL & MOISTURE PROTECTION				
	Remove & Replace Roof System	15,859	SF	16.25	257,702
	Water Damage Repair @ Buildings	1	AL	75,000.00	75,000
	Metal Fascia, Flashings, & Trims Repair (Allowance)	1	AL	25,000.00	25,000
	Roof Drains, Scuppers, Gutters & Downspouts Repairs (Allowance)	1	AL	25,000.00	25,000
	Insulation Repairs @ Impacted Areas	1	AL	25,000.00	25,000
	Miscellaneous Caulking & Sealants @ Interior	9,048	LF	5.00	45,238
	SUBTOTAL THERMAL				**452,940**

DIV 08	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	OPENINGS				
	Door Restoration Throughout (Allowance)	50	EA	1,200.00	60,000
	Door Hardware Replacement & Repair (Allowance)	50	EA	475.00	23,750
	Replace Latching Hardware @ Walk-in Refrigerator / Freezer (Allowance)	1	AL	2,500.00	2,500
	Windows Repair As Needed (Allowance)	2,500	SF	42.00	105,000
	Historic Preservation Premium - Doors & Windows	1	AL	35,000.00	35,000
	SUBTOTAL OPENINGS				**226,250**

DIV 09	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	INTERIOR FINISHES				
	Plaster Wall Patching	56,282	SF	3.50	196,988
	Gyp Bd Ceiling Patching	7,817	SF	3.10	24,233
	ACT Ceiling Repair / Tile Replacement	23,451	SF	3.21	75,278
	Gyp Bd Detailing @ Int Soffits, Cols, etc.	1	LS	25,000.00	25,000
	Remove & Replace All Carpet	23,451	SF	3.88	90,990
	Clean/Repair Natural Stone/Tile Flooring	7,817	SF	20.00	156,340
	Repair/Replace VCT	661	SF	1.80	1,189
	Vinyl Base	1,000	LF	2.20	2,200
	Wall Coverings Repair / Replacement	28,141	SF	3.90	109,751
	Clean/Repair Natural Stone/Tile @ Walls	18,573	SF	12.40	230,308
	Paint Gyp Bd Walls & Ceilings w/2 Coats Latex	64,099	SF	0.60	38,460
	Miscellaneous Accent Painting Allowance	1	LS	50,000.00	50,000

	Exterior Painting, Staining & Refinishing of Bldg, Railings, Other Features (Allowance)	30,191	SF	2.78	83,931
	Upgrade Fire Resistance of Existing Walls, Stairs & Doors (Allowance)	1	AL	75,000.00	75,000
	Historic Preservation Premium - Finishes (Allowance)	1	AL	85,000.00	85,000
	SUBTOTAL INTERIOR FINISHES				**1,244,667**

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)				Excluded
	Corner Guards				Excluded
	Code Required Signage				Excluded
	Wayfinding Signage				Excluded
	Access Ladders				Excluded
	SUBTOTAL SPECIALTIES				**EXCLUDED**

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				
	Entry Receptionist Desk Upgrade				Excluded
	Plastic Laminate Countertops Repairs				Excluded
	Solid Surface Countertops Repairs				Excluded
	Copy / Print / Mail Center Casework				Excluded
	Kitchen / Break Room Casework				Excluded
	Window Roller Blinds - no valances, installed				Excluded
	Display Cases				Excluded
	Marker Boards				Excluded
	Tackboards				Excluded
	Office Furnishings & Other Building FF & E				Excluded
	SUBTOTAL FURNISHINGS				**EXCLUDED**

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	2,500.00	2,500
	SUBTOTAL CONVEYING SYSTEMS				**2,500**

DIV 21	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	FIRE SUPPRESSION				
	Fire Sprinklers - Full Replacement				Excluded
	Upgrade Fire Suppression System @ Stove Top Exhaust Hood (Allowance)	1	AL	50,000.00	50,000
	Backflow Prevention				Excluded
	FDC				Excluded
	Booster Pump (Allowance)				Excluded
	SUBTOTAL FIRE SUPPRESSION				**50,000**

DIV 22	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	PLUMBING				
	Demo Existing Plumbing				Excluded
	Plumbing Systems - Full Replacement				Excluded
	Provide ADA Fixtures, where necessary (Allowance)	18	EA	2,500.00	45,000
	Insulation @ Lavatory & Mechanical Piping				Excluded
	SUBTOTAL PLUMBING				**45,000**

DIV 23	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	HVAC				
	HVAC - Service & Investigate Work, Minor Repairs Only	4,690	SF	2.33	10,928
	Upgrade HVAC Controls				Excluded
	SUBTOTAL HVAC				**10,928**

DIV 26	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	ELECTRICAL				
	Demo Existing Electrical Outlets & Replace, where necessary	7,817	SF	1.00	7,817
	Replace Panels	31,268	SF	6.21	194,174
	New Electrical Wiring & Conduit	31,268	SF	2.98	93,179
	Remove Light Fixtures throughout Building, where necessary	7,817	SF	1.00	7,817
	Replace Light Fixtures w/ LED	31,268	SF	2.50	78,170
	Replace & Provide Lighted Exit Signs (Allowance)	24	EA	250.00	6,000
	Automated Lighting Controls/Sensors	31,268	SF	1.80	56,282
	Replace Emergency GenSet				Excluded
	UPS System				Excluded
	Solar Photovoltaic System				Excluded

	Wind Turbine System				Excluded
	Reattach Lightning Protection System	1	LS	1,500.00	1,500
	SUBTOTAL ELECTRICAL				**444,939**

DIV 27	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	DATA / COMMUNICATIONS				
	Fire Alarm System - Minor Upgrades & Relocation from Impacted Areas	10,318	SF	0.92	9,493
	Data & Communications Conduit - Full Replacement	31,268	SF	0.92	28,767
	Data & Communications Equipment				Excluded
	A/V Equipment				Excluded
	SUBTOTAL COMMUNICATIONS				**38,260**

DIV 032	Description	Quantity	Unit	TOTALS	
				Cost/Unit	Total Cost
	SITE IMPROVEMENTS				
	Paving				
	Sitework for Drainage Issues (Allowance)	1	AL	75,000.00	75,000
	Concrete Replacement at Sidewalks	5,000	SF	6.50	32,500
	Concrete Sidewalks - Seal Cracks	1	LS	5,000.00	5,000
	New 6" x 18" F.R. Concrete Curb & Gutter				Excluded
	New 4" Sidewalk				w/ Above
	Landscape				
	Fine Grade Topsoil				Excluded
	Sod Repair				Excluded
	Relocate Irrigation (Allowance)	1	AL	25,000.00	25,000
	SUBTOTAL SITE IMPROVEMENTS				**137,500**

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 -					**4,019,112**
					129

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