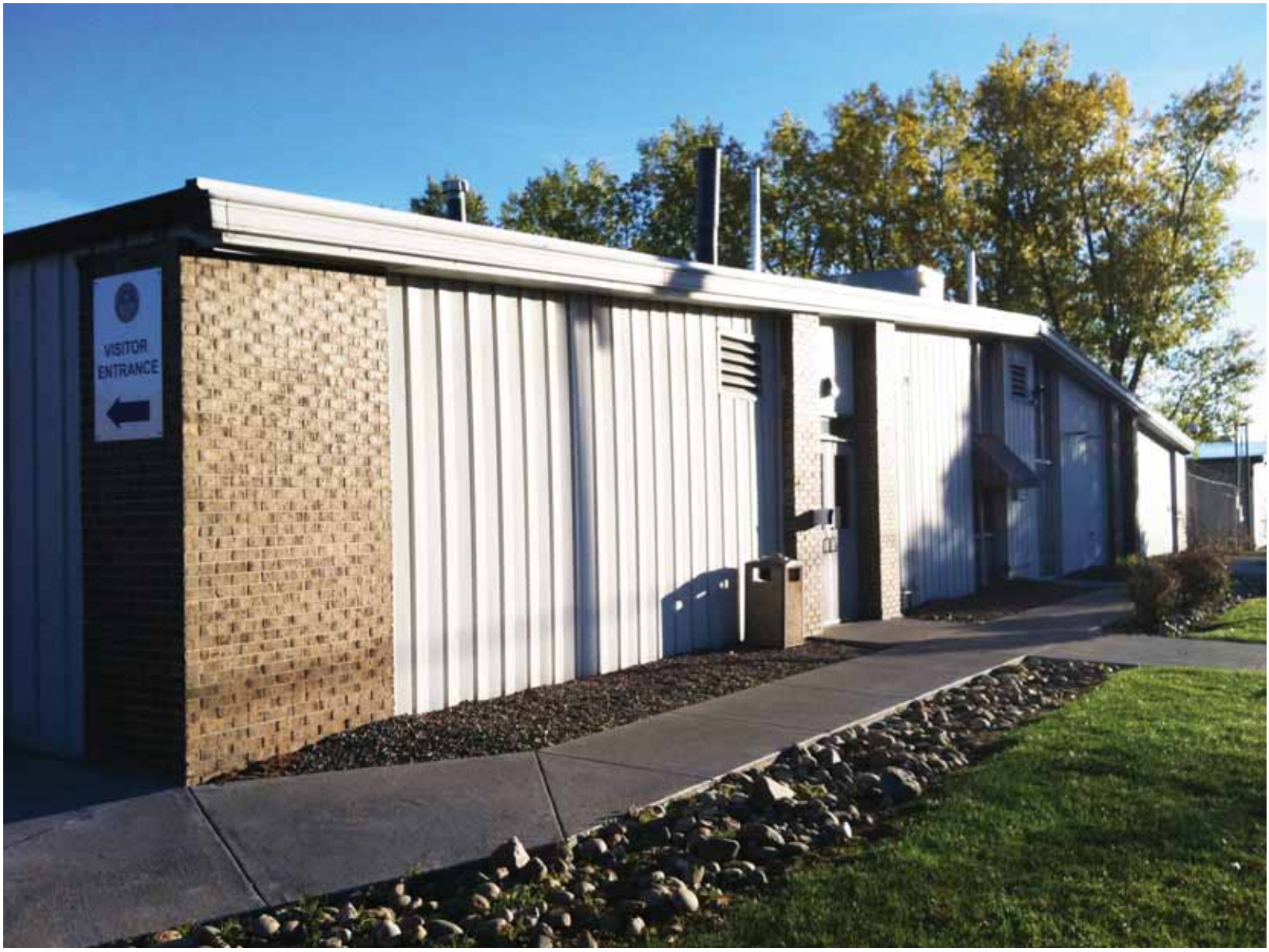
# CAPITOL COMPLEX MASTER PLAN

## FINDINGS & RECOMMENDATIONS (F & R) NEEDS ASSESSMENT

## NORTH CAMPUS WEST BUILDING, 1001 EAST 62ND AVENUE (DENVER)

NOVEMBER 2014




RNL


FINDINGS & RECOMMENDATIONS (F&R) NEEDS ASSESSMENT

# NORTH CAMPUS WEST BUILDING
## 1001 EAST 62ND AVENUE (DENVER)

November 2014

## TABLE OF CONTENTS





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## TABLE OF CONTENTS (CONTINUED)

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# EXECUTIVE SUMMARY

The purpose of this report is to provide a Findings & Recommendations (F&R) Needs Assessment of the North Campus West Building at 1001 East 62nd Avenue in Denver, Colorado (Adams County). The report includes a description and evaluation of the existing conditions, recommendations, and cost estimates for the recommended work from the following focus areas: architecture (RNL), structural (Martin/Martin Consulting Engineers), civil (Martin/Martin Consulting Engineers), mechanical/electrical/plumbing (RMH Group), voice and data (Shen Milsom Wilke), security (Shen Milsom Wilke), and cost estimating (CBRE, Inc.). The project team, led by RNL, reviewed existing building documentation, drawings, and audit reports provided by the Owner, and conducted a site visit to identify and document the observable existing conditions of the building and its code and life safety issues.

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

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

1. Demolish the building structure, including the abatement of all asbestos, and rebuild as necessary to suit current needs. Test the building materials for asbestos prior to abatement. This recommendation encompasses life safety, loss of use/reliability, finishes, and overall energy efficiency issues and is related to the age and condition of the building, which was constructed as a temporary prefabricated metal building in 1968.

OR, if the building cannot be demolished and must remain in use, the following are the top five priorities:

1. Fix/correct fuel testing room code issues. This recommendation encompasses life safety issues and is related to the hazardous materials stored and tested in the room and fire protection code and National Electrical Code issues.

High Level Cost Estimate: $189,661

2. Fix/correct print shop code issues. This recommendation encompasses life safety issues and is due to the levels of paper dust accumulation throughout and fire protection code and National Electrical Code issues.

   High Level Cost Estimate: $202,396

3. Replace fire alarm/install fire sprinkler system. This recommendation encompasses life safety issues and is due to the age of the fire alarm system and fire protection code issues related to the fuel testing room and print shop code issues.

   High Level Cost Estimate: $289,938

4. Replace roof and add fall protection. This recommendation encompasses life safety and loss of use/reliability issues and is due to the age and condition of the roof and the fact that no fall protection is provided.

   High Level Cost Estimate: $565,523

5. Replace HVAC. This recommendation encompasses loss of use/reliability issues and overall energy efficiency issues and is due to the age and condition of the HVAC system and the inability to maintain a consistent comfortable working temperature within the building. Also provide air distribution, as part of the overall project, in the main entrance and lobby spaces which currently use portable heaters to provide warmth.

   High Level Cost Estimate: $687,552

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

$4,939,494

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:

$5,469,429

# 1.0 OVERVIEW

## 1.0-A ARCHITECTURE OVERVIEW

The North Campus site, located in Denver, Colorado in Adams County, contains three buildings originally constructed as temporary buildings. The North Campus West Building was constructed in 1968. The building is on the northwest corner of East 62nd Avenue and Downing Street. The building was originally constructed as a classroom building but is currently being used as office space for the State of Colorado's Department of Personnel & Administration and Department of Revenue, as laboratory space for the Department of Labor & Employment's Oil & Public Safety Lab, and as a print shop facility for the Department of Personnel & Administration's Integrated Document Solutions (IDS) Print Operations. The North Campus West Building is a Stran-Steel metal building on a concrete foundation with areas of brick infill walls and grey transite panels above and below the windows. This one-story building grosses 37,763 square feet of space.

The architectural assessment of the North Campus West Building at 1001 East 62nd Avenue included reviews of the existing building documentation, drawings, and audit reports provided by the Owner, and a site visit to survey and document the existing conditions of the building and its code and life safety issues. During the site survey on 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. In general, the building is in poor condition. 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 overall age and condition of the building as a whole. Other concerns include the presence of asbestos and code issues with the Fuel Testing Room and with the Print Shop. These concerns encompass life safety, loss of use/reliability, finishes, and overall energy efficiency issues. These findings, along with recommendations for repairs, are detailed in the body of this report.

## 1.0-B STRUCTURAL OVERVIEW

Martin/Martin conducted a building condition assessment on October 22, 2013 of the west building of the north campus, 1001 East 72nd Avenue in Denver, Colorado. The purpose of our condition assessment was to identify structural defects, damage, and deterioration.

The buildings at the north campus are all engineered metal buildings. The typical structural system for the west building is metal panels at the walls and roof spanning between cold-formed steel girts or purlins, with the girts and purlins supported by heavier gage steel frames. The building has a membrane roof overlaying the metal panels. Some areas of exterior wall panel are interrupted by brick or masonry infill.

The structural framing that was readily observable is in fair condition. The majority of the steel framing appears to have been coated with some sort of thermal spray-on insulation. This coating prevented close examination of significant portions of the structure, but the coating is beginning to fail and fall from the structure.

One section of interior partition framing shows evidence of cracking due to structural movement. Given the typically observed drift and deflection characteristics of most engineered metal buildings, this cracking can likely be attributed to movement of the main building frame within its structural capacity. The cracking observed is not a structural concern.

The roof of the building was sloped and no fall protection was provided. A fall protection system should be installed along the roof to meet current safety codes.

## 1.O-C CIVIL OVERVIEW

The State of Colorado North Campus contains three buildings originally considered “temporary” buildings; the west, north and east buildings. This assessment report covers the west building. The west building of the State of Colorado North Campus site is approximately 2.46 acres and is located at 1001 East 62nd Avenue in Adams County, Colorado. The existing site consists of the building, parking lot, a landscaped courtyard and street right-of-way including sidewalk and landscaping. The main building entrance is accessed from the south side. The condition of the site surrounding the building is consistent with an estimated age of 30+ years.

The site exterior is generally in poor condition. The main concern regarding the site is drainage and the condition of the asphalt in the parking lot. There are numerous locations around the site with broken, deteriorated and cracked asphalt in need of repair or replacement. Broken surfaces in walking paths are a tripping hazard and safety concern. Surface cracks and broken pavement surfaces also increase the risk of further site deterioration. Localized ponding was observed along with indicators of improper drainage. It is recommended that the entire site be re-graded and re-paved to improve the surface drainage and maintain the site posterity. While the existing building functions in its current state, improvements can be made to improve drainage, comply with regulations and enhance aesthetics.

## 1.0-D MECHANICAL, ELECTRICAL, AND PLUMBING OVERVIEW

The electrical and mechanical assessment of the North Campus West building 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. During the site survey, information about the building history and on the electrical and mechanical systems conditions, maintenance routines, and installation dates. The North Campus West is a metal prefab structure with mostly office space and a mail room production area. It also houses the state fuel testing lab where gasoline is tested.

The main concerns with the electrical systems in this building are the age of the equipment, including the power, lighting, and fire alarm systems. Some of the electrical equipment appears to be past its useful life. This will lead to longer outages because it will be difficult to find replacement parts. Also the Printing area and the fuel test area need to be reviewed to ensure they meet the building and electrical codes for a safe work environment.

The main concern regarding mechanical system is the ventilation system and the fire sprinkler system. The building has high fire load and providing fire sprinkler system will improve the life safety of the building.

### Energy Conservation

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

Replacing old HVAC units with new high efficiency units will reduce heating and cooling energy costs. Verifying air distribution and balancing the airflows in the space will improve the comfort conditions in the space and eliminate the use of portable heaters thus saving energy.

## 1.0-E VOICE AND DATA OVERVIEW

The Voice and Data IT/Telecommunications Infrastructure assessment report provides recommendations for the design and construction of the IT/Telecommunications Infrastructure required to support Voice/Data and other technology systems within the West building 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 plant specifications. It should be noted where referenced, that IT systems infrastructure not only includes the cabling, but the cabling pathways and the spaces (or rooms) that support the network cabling. Technology spaces requiring to be properly outfitted in the building may include the Main Distribution Facility (MDF) room, and distributed IDF rooms (minimum of one per floor). Backbone infrastructure shall include proper cabling pathways between MDF/IDF rooms, in order to support installation of both fiber and copper backbone cabling. Singlemode and laser optimized multimode fiber optic cables, along with Category 3 copper backbone cables should be installed from the MDF room to each IDF room to support the technology systems. Hardwired network connectivity should be provided for users, and distributed appropriately throughout all areas of the facility. Category 6, at minimum, UTP cable shall be installed from the telecom outlets and IP field devices to termination hardware in the IDF rooms using conduit and/or cable tray horizontal pathways. A proper grounding and bonding system must be provisioned for, and will provide a uniform ground within the telecommunications rooms, to ensure safe and reliable operation of the communications and low-voltage equipment and systems. 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 telecommunications infrastructure renovation projects within the facility, any applicable Governor's Office of Information Technology (OIT) design criteria documents should be complied with.

The following list prioritizes voice/data infrastructure upgrades required:

1. Necessary: Retrofit facility with proper MDF/IDF room distribution, which meets industry standard for telecommunication structured cabling system.

2. Necessary: Replace horizontal copper station cabling with Cat 6 network cabling.
3. Necessary: Replace vertical and network backbone cabling with appropriate copper and fiber optic cabling.
4. Necessary: Provide voice/data infrastructure to support wireless access points (WAPs), 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 North Campus West Building. The security systems should be planned and designed to allow the security personnel the operational flexibility to provide various levels of security based on the threat level at a given time. Security systems should be designed such that they may be monitored remotely from centralized security monitoring locations. Best practice security design methodology should be applied, including crime prevention through environmental design (CPTED), layered security, integrated design, and concentric circles of protection. Additionally it is recommended that the following document be used a guideline for developing specific security design criteria for renovations: ASIS Facilities Physical Security Measures, IESNA G-1-03 Guideline for Security Lighting, Unified Facilities Criteria UFC 4-010-01.

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

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

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

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

For the North Campus West Building renovation work, requirements for security device additions/upgrades and specific security system functionality are to be coordinated with State security personnel during design and construction phases.

The following list prioritizes security system upgrades required:

NOTE: Consideration should be given to the investigation of a site security plan.

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 RECOMMENDATIONS

## 2.1 ARCHITECTURE

### 2.1-A EXTERIOR BUILDING ENVELOPE/SITE

**General**

The North Campus West Building is a one-story tall Stran-Steel metal building constructed in 1968 on a concrete foundation with areas of brick infill walls. It was reported that the grey panels above and below the windows are transite (an asbestos-cement product). The windows are single pane with metal frames and appear original to the building. There are multiple entrances located around the exterior of the building. The main visitor's entrance is located on the west side and is accessed from the East 62nd Avenue parking lot. It was reported that the parking lot was recently regraded to solve an issue with water leaking into the building at grade level. There is a rubber membrane roof along the entire length of the building.

The building envelope is in poor condition overall. Various elements are showing the effects of deferred maintenance, others are simply damaged or worn out.

Front/South Elevation of the North Campus West Building

Side/East Elevation of the North Campus West Building


Side/West Elevation of the North Campus West Building

Back/North Elevation of the North Campus West Building

**Cladding**

The metal panels on the walls around the exterior of the building are in fair to poor condition overall with areas of deterioration and areas of unrepaired holes left in the panels noted during the site survey visit (see Fig. 2.1.A.1 and Fig. 2.1.A.2). One of the unrepaired holes observed at a metal panel has loose wires sticking out (see Fig. 2.1.A.3). The metal trim around the exterior of the building was observed to be coming loose and to have sealant deteriorating or missing entirely in a number of locations (see Fig. 2.1.A.4, Fig. 2.1.A.5, and Fig. 2.1.A.6). Areas of corrosion were noted at the metal panels around the building, especially along the top and along the base of the panels (see Fig. 2.1.A.7 and Fig. 2.1.A.8). A metal capping piece above a portion of a brick infill wall was noted to have evidence of corrosion (see Fig. 2.1.A.9). Bent and damaged areas of the metal wall panels were observed especially near parking areas around the building (see Fig. 2.1.A.10). The damage is likely from vehicles running into the building. It was noted that there are no concrete guard posts/bollards placed around the original building to protect the structure from vehicle damage in and around the loading dock doors and parking areas.

The metal canopies above the windows around the exterior of the building are in fair to poor condition overall with areas of deterioration and damage noted, along with general soiling (see Fig. 2.1.A.11 and Fig. 2.1.A.12).

The transite panels, an asbestos-cement product, located above and below the windows around the exterior of the building were noted to be in generally fair condition overall with minor wear-and-tear. The sealant around the panels was noted to be in poor condition overall with deterioration and gaps noted (see Fig. 2.1.A.13). An improperly waterproofed hole cut through a transite panel was observed during the site survey visit, leaving the building vulnerable to water penetration and potentially exposing the asbestos fibers within the panel (see Fig. 2.1.A.14).

The areas of brick infill walls around the exterior of the building are in fair to poor condition overall with damage and deterioration of the bricks and the mortar noted (see Fig. 2.1.A.15, Fig. 2.1.A.16, and Fig. 2.1.A.17). There was an area of brick observed with a coating of white residue on the east side of the building along the courtyard (see Fig. 2.1.A.18).

Areas of peeling and deteriorating paint were observed in a few locations around the exterior of the building (see Fig. 2.1.A.19 and Fig. 2.1.A.20).

The stucco surrounding the door to the visitor's entrance on the west side of the building was observed to be in generally poor condition with spalling and cracking noted (see Fig. 2.1.A.21).

The concrete foundation was observed to be cracking and spalling in areas around the exterior of the building (see Fig. 2.1.A.22). Corrosion of a metal sill plate was observed at an area along the base of the building during the site survey visit (see Fig. 2.1.A.23).

Fig. 2.1.A.1 Deteriorating areas of previously repaired metal panels observed around the exterior of the building.

Fig. 2.1.A.2 Unrepaired holes leaving the building envelope vulnerable to water penetration and discoloration of the metal panels observed in areas around the exterior of the building.

Fig. 2.1.A.3 An unrepaired hole observed with loose wires sticking out.

Fig. 2.1.A.4 Metal trim observed to be coming loose around the exterior of the building.

Fig. 2.1.A.5 Metal trim observed to be coming loose around the exterior of the building.

Fig. 2.1.A.6 Sealant observed to be deteriorating or missing entirely at the metal trim around the exterior of the building.

Fig. 2.1.A.7 Corrosion observed at the top of the metal panels around the exterior of the building.

Fig. 2.1.A.8 Corrosion observed at the base of the metal panels around the exterior of the building.

Fig. 2.1.A.9 Corrosion of a metal capping piece noted above a portion of a brick infill wall.

Fig. 2.1.A.10 Damaged metal panels observed along parking and loading dock areas around the exterior of the building.

Fig. 2.1.A.11 Damaged and deteriorating metal canopies observed around the exterior of the building.

Fig. 2.1.A.12 Generally soiled and deteriorating metal canopies observed around the exterior of the building.

Fig. 2.1.A.13 Sealant observed to be deteriorating or missing entirely around the edges of the transite panels.

Fig. 2.1.A.14 An improperly waterproofed hole created through a transite panel which may be exposing the asbestos fibers within the panel.

Fig. 2.1.A.15 Areas of damaged and deteriorating brick and mortar observed around the exterior of the building.

Fig. 2.1.A.16 Areas of damaged and deteriorating brick and mortar observed around the exterior of the building.

Fig. 2.1.A.17 Mortar observed to be deteriorating and leaving gaps in areas of the brick infill walls around the exterior of the building.

Fig. 2.1.A.18 White residue observed at a brick wall on the east side of the building.

Fig. 2.1.A.19 Peeling paint observed at a metal grille cover.

Fig. 2.1.A.20 Deteriorating paint observed at a wall panel.

Fig. 2.1.A.21 Deteriorating stucco observed around the door to the visitor's entrance on the west side of the building.

Fig. 2.1.A.22 Cracked and spalling concrete observed along the building's foundation.

Fig. 2.1.A.23 Corrosion observed at a metal sill plate along the base of the building and staining the concrete foundation.

**Recommendations:**

- Demolish the building structure, including the abatement of all asbestos, and rebuild as necessary to suit current needs. Test the building materials for asbestos prior to abatement.

OR, if the building cannot be demolished and must remain in use:

- Repair or replace any damaged, deteriorating, or corroding metal wall panels around the exterior of the building.
- Repair any holes that have been left unaddressed around the exterior of the building to prevent any further damage to the building envelope. Remove the loose wires sticking out of the side of the building as noted above.
- Repair or replace any corroding or damaged metal elements around the exterior of the building, such as the metal trim or the metal capping pieces above areas of the brick infill walls.
- Test the panels reported to be transite for asbestos and abate as necessary prior to removal. Replace the window and panel assemblies with new assemblies, including new trim and sealant around the perimeter of the assembly and provide new window canopies.
- Install concrete guard posts/bollards along parking and loading dock areas around the exterior of the building to protect the structure from future vehicular damage.
- Repair or replace any damaged or deteriorating brick infill walls around the exterior of the building.
- Repair any cracked joints and tuck point the brick infill walls around the exterior of the building.
- Clean the white residue off of the brick infill wall adjacent to the courtyard on the east side of the building as noted above. Determine the cause of the residue and repair as necessary.
- Scrape and repaint any elements around the exterior of the building with peeling or deteriorating paint, with the exception of any transite panels.
- Repair or replace the deteriorating stucco surrounding the visitor's entrance door on the west side of the building.
- Repair or replace any corroding metal sill plates around the base of the building.

- Repair or replace any spalling or otherwise damaged areas of the concrete foundation around the exterior of the building.

**Glazing Systems and Doors**

The windows are single pane with metal frames and appear original to the building. It was reported that the windows leak, especially in the event of a wind-driven rain. The windows are in generally fair to poor condition overall with deterioration of the frames and broken glass noted around the exterior of the building (see Fig. 2.1.A.24, Fig. 2.1.A.25, Fig. 2.1.A.26, and Fig. 2.1.A.27). There was evidence of deterioration and water intrusion observed on the interior side of the windows as well (see Fig. 2.1.A.28). There was a metal header observed to be corroding above a window on the east side of the building (see Fig. 2.1.A.29). The sealant around the windows is in generally poor condition with extensive deterioration noted (see Fig. 2.1.A.30). The weatherstripping around the windows was also observed to be deteriorating and coming loose in a number of locations (see Fig. 2.1.A.31). It appears that an attempt was made to mitigate the problems related to the deteriorating sealant and weatherstripping around the windows by applying duct tape along the base of a few windows on the east side of the building (see Fig. 2.1.A.32). It was reported that replacement of the windows is on the Capitol Complex list of projects that need to be addressed.

Fig. 2.1.A.24 General deterioration of the window frames noted around the exterior of the building.

Fig. 2.1.A.25 General deterioration of the window frames noted around the exterior of the building.

Fig. 2.1.A.26 General deterioration of the window frames noted around the exterior of the building.

Fig. 2.1.A.27 Broken glass observed at a few windows, especially along the east side of the building.

Fig. 2.1.A.28 Evidence of deterioration and water intrusion observed on the interior side of the windows.

Fig. 2.1.A.29 Corrosion observed at a metal header above a window on the east side of the building.


Fig. 2.1.A.30 Typical instance of deteriorating sealant observed at the windows around the exterior of the building.

Fig. 2.1.A.31 Typical instance of deteriorating weatherstripping observed at the windows around the exterior of the building.

Fig. 2.1.A.32 Duct tape appears to have been applied along the base of a few windows on the east side of the building in a likely attempt to mitigate the issues with the deteriorating sealant and weatherstripping.

The entrance and exit doors around the exterior of the building are in fair condition overall with general wear-and-tear noted (see Fig. 2.1.A.33 and Fig. 2.1.A.34). A door frame was observed to be deteriorating at an exit located on the west side of the building to the north of the visitor's entrance (see Fig. 2.1.A.35). Deterioration of the sealant was observed around the door and sidelight assembly at the entrance to the courtyard on the south end of the east side of the building (see Fig. 2.1.A.36) with evidence of water damage observed on the interior side of the sidelights (see Fig. 2.1.A.37). The doors on the north end of the east side of the building have evidence of corrosion (see Fig. 2.1.A.38) and the sidelight to the south was noted to have cracked glass (see Fig. 2.1.A.39).

Fig. 2.1.A.33 General wear-and-tear noted at the doors around the exterior of the building.

Fig. 2.1.A.34 General wear-and tear noted to the inside and outside face of the exterior doors around the building.

Fig. 2.1.A.35 Deterioration of the door frame noted at a door located on the west side of the building to the north of the visitor's entrance.

Fig. 2.1.A.36 Deterioration of the sealant noted at the door assembly on the south end of the east side of the building leading to the exterior courtyard.

Fig. 2.1.A.37 Evidence of water damage observed on the interior side of the sidelight of the door and sidelight assembly on the south end of the east side of the building.

Fig. 2.1.A.38 Evidence of corrosion observed at the pair of doors on the north end of the east side of the building.

Fig. 2.1.A.39 Cracked glass observed at the sidelight south of the pair of doors on the north end of the east side of the building.

**Recommendations:**

- Demolish the building structure, including the abatement of all asbestos, and rebuild as necessary to suit current needs. Test the building materials for asbestos prior to abatement.

OR, if the building cannot be demolished and must remain in use:

- Replace existing windows around the exterior of the building with new energy efficient windows. Replace the window and panel assemblies with new assemblies, including new trim, sealant, and weatherstripping around the perimeter of the assembly and provide new window canopies. Also repair or replace any damaged or corroding metal headers around the exterior of the building in conjunction with the window replacement.

- Repair or replace any deteriorating or damaged doors and door frames around the exterior of the building. Remove any corrosion and refurbish doors and door frames to remain. Replace any cracked glass at the sidelights to remain.
- Remove the sealant and weatherstripping around doors and sidelights to remain and replace with new sealant and weatherstripping.

**Roof**

The roof consists of a rubber membrane (see Fig. 2.1.A.40) in fair to poor condition overall. It was reported that the roof was installed in the late 1990's and that there are no known leaks. It was further reported that there are currently plans to replace the roof. The rubber membrane was observed to have patches and seams with deteriorating sealant, missing entirely in some areas, and leaving the roof system vulnerable to water penetration (see Fig. 2.1.A.41, Fig. 2.1.A.42, and Fig. 2.1.A.43). Large areas of the roof were wet at the time of the site survey visit with smaller areas of standing water observed throughout (see Fig. 2.1.A.44 and Fig. 2.1.A.45). Corrosive dust shedding off of metal components and equipment around the roof was noted to be collecting on areas of the rubber membrane (see Fig. 2.1.A.46). Evidence of corrosion was noted at a few of the vent covers around the roof (see Fig. 2.1.A.47). The top of the canopy at the northeast corner of the building was observed to be generally soiled and to have deteriorating sealant along the wall of the building. (see Fig. 2.1.A.48). It was reported that replacement of the roof is on the Capitol Complex list of projects that need to be addressed.

Fig. 2.1.A.40 Rubber membrane roof in fair to poor condition overall.

Fig. 2.1.A.41 Typical instance of deteriorating sealant along the seams of the rubber roofing membrane.

Fig. 2.1.A.42 Typical instance of sealant missing entirely along the seams of the rubber membrane and exposing the roof system to water penetration.

Fig. 2.1.A.43 Typical instance of deteriorating sealant at patched areas of the rubber roofing membrane.

Fig. 2.1.A.44 Large areas of the roof observed to be wet at the time of the site survey visit.

Fig. 2.1.A.45 Areas of standing water observed during the site survey visit.

Fig. 2.1.A.46 Corrosive dust observed on the rubber roofing membrane near metal equipment and roof components.

Fig. 2.1.A.47 Evidence of corrosion noted at a roof vent cover.

Fig. 2.1.A.48 The top of the canopy at the northeast corner of the building was observed to be generally soiled and to have deteriorating sealant along the wall of the building.

**Recommendations:**

- Demolish the building structure, including the abatement of all asbestos, and rebuild as necessary to suit current needs. Test the building materials for asbestos prior to abatement.

OR, if the building cannot be demolished and must remain in use:

- Continue with the plan to tear-off and replace the roof and gutters. Inspect the condition of the metal roof panels beneath the rubber membrane and replace as necessary. Replace the metal roof panels with deteriorating spray-on insulation over the north loading dock and storage room with new metal panels and insulation.

- Clean the top of the canopy at the northeast corner of the building and ensure that the canopy has a positive slope to allow water to drain away. Remove the sealant along the wall of the building and replace with new sealant.

**Site Elements**

The exterior concrete stairway at the northwest loading dock was noted to be deteriorating with spalling observed along the outside edge (see Fig. 2.1.A.49). Widespread evidence of corrosion was noted along the northwest loading dock area (see Fig. 2.1.A.50).

The concrete paver along the base of the pair of doors on the north end of the east side of the building was observed to be cracked, exposing the system to water penetration and further damage (see Fig. 2.1.A.51). Areas of the concrete pavers throughout the east courtyard were observed to be spalling and cracking, creating a potential tripping hazard (see Fig. 2.1.A.52).

There is a corroding metal panel embedded within the asphalt observed near the back (north side) of the building (see Fig. 2.1.A.53).

Fig. 2.1.A.49 Spalling concrete observed at the exterior stairway at the northwest loading dock.

Fig. 2.1.A.50 Corrosion observed at the northwest loading dock.

Fig. 2.1.A.51 Deterioration of the concrete paver observed along the base of the doors on the north end of the east side of the building.

Fig. 2.1.A.52 Spalling and cracking concrete pavers observed throughout the east courtyard.

Fig. 2.1.A.53 A corroding metal panel embedded within the asphalt observed near the back (north side) of the building.

**Recommendations:**

- Demolish the building structure, including the abatement of all asbestos, and rebuild as necessary to suit current needs. Test the building materials for asbestos prior to abatement.

OR, if the building cannot be demolished and must remain in use:

- Repair or replace the spalling concrete at the exterior stairway on the south side of the northwest loading dock.
- Repair or replace the corroding metal elements along the northwest loading dock.
- Repair or replace the cracked concrete paver along the base of the doors on the north end of the east side of the building.
- Repair or replace the spalling and cracked concrete pavers throughout the east courtyard.
- Remove the corroding metal panel embedded within the asphalt near the back (north side) of the building.

## 2.1-B CODE ISSUES

**Applicable Codes**

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

The 2012 edition of the International Building Code (IBC)

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

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

(as adopted by the Colorado State Buildings Program)

The National Fire Protection Association Standards (NFPA)

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

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

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

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

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

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

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

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

**Building Construction Type**

The building is 1 story tall and has a total floor area of 37,763 square feet. The North Campus West Building is a structure with multiple occupancy groups related to its uses, according to the International Building Code (2012).

Integrated Document Solutions (IDS) Print Operations has a print shop on the north side of the building. This space would be considered as Occupancy Group F-1 according to the IBC (primary use as a moderate-hazard factory industrial Group F-1 includes uses that involve printing or publishing).

The remainder of the building consists of office space for the State of Colorado's Department of Personnel & Administration and Department of Revenue, including the Department of Labor & Employment's Oil & Public Safety Lab. These spaces would be considered as Occupancy Group B according to the IBC (primary use as a Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts). During the site survey visit, it was reported that the Oil & Public Safety Lab is used for testing and storing gasoline and that, at any given time, a maximum amount of approximately 40 gallons of gasoline is present in the lab. It was noted during the site survey visit that the fumes in this area were strong. Further investigation is recommended to determine whether the amount of gasoline present in the Oil & Public Safety Lab meets code requirements for exempt amounts of hazardous materials. If the quantity of hazardous materials within the lab exceeds the amount allowed by code and results in a High-Hazard Group

H occupancy, then reduce the quantities present or the building must comply with International Building Code, National Fire Protection Association Standards, and any applicable Life Safety Code requirements for the presence of hazardous materials.

It was reported that a code compliance analysis is on the Capitol Complex list of controlled maintenance projects that need to be addressed.

**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 North Campus West 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.

According to Table 1014.3 of the IBC (2012), the common path of egress travel for a building without a sprinkler system in a B-type occupancy is 100 feet with an occupant load less than 30 and 75 feet with an occupant load greater than 30. The common path of egress travel for a building without a sprinkler system in an F-type occupancy is 75 feet regardless of the occupant load. The plans provided by the Owner appear to indicate that the spaces throughout the North Campus West Building comply with these code requirements. The length of the longest common path of egress travel and the occupancy loads of each floor should be verified as part of any future renovation plan.

According to Table 1016.2 of the IBC (2012), the exit access travel distance in a B-type and in an F1-type occupancy without a sprinkler system is 200 feet. The plans provided by the Owner appear to indicate that the spaces throughout the North Campus West Building comply with these code requirements. The length of the greatest distance of travel and the occupancy loads of each floor should be verified as part of any future renovation plan.

The northwest exit from the print shop exits adjacent to a loading dock. It was noted during the site survey visit that items are being stored in the corridor leading to the exit and that furniture is being stored on the platform outside of the exit (see Fig. 2.1.B.1 and Fig. 2.1.B.2). According to Section 1020.1 of the IBC (2012), an exit shall not be used for any purpose

that interferes with its function as a means of egress. This issue with the northwest exit from the print shop should be addressed immediately and regardless of any future renovation plans.

There were egress issues noted with the exits and fenced and gated courtyard shared with the North Campus East Building on the east side of the North Campus West Building. There are two pairs of doors that lead out to the courtyard from the east side of the North Campus West Building. The doors on the south end of the east side of the building are equipped with signage on the glass stating “NOT AN EMERGENCY EXIT” (see Fig. 2.1.B.3) despite the fact that there is an exit sign hanging from the ceiling in front of the vestibule space leading to the doors (see Fig. 2.1.B.4). The southernmost pair of doors leading to the courtyard on the east side of the building requires the use of a key code entry system in order to reenter the building. The northernmost pair of doors leading to the courtyard on the east side of the building is an emergency exit only and does not allow reentry to the building from the courtyard. One of the two pairs of doors leading to the North Campus East Building is equipped with a key code entry system and the other does not allow entry to the building from the courtyard. Another issue is that the length of the longest common path of egress travel from the courtyard appears to be approximately 157 feet (without exit access at the north and south gates), which is greater than the 75 feet allowed by code requirements for the North Campus West Building. Further, the two courtyard gates, located on the north side and on the south side of the courtyard, did not appear to be easily operable from the inside of the courtyard, preventing egress to a public way (see Fig. 2.1.B.5 and Fig. 2.1.B.6). According to Section 1027.5 of the IBC (2012), the exit discharge shall provide a direct and unobstructed access to a public way. According to Section 1008.1.9 of the IBC (2012), egress doors shall be readily openable from the egress side without the use of a key or special knowledge or effort. Since the gates are part of the means of egress system from the building, they should be equipped with appropriate hardware to allow the gates to swing in the direction of egress travel.

The door leading to the exit corridor on the west side of the Oil & Public Safety Lab was noted to be equipped with a bolt-style lock (see Fig. 2.1.B.7). According to Section 1008.1.9.4 of the IBC (2012), manually operated flush bolts or surface bolts are not permitted. Panic hardware or fire exit hardware should be provided on any doors throughout per egress code requirements to allow egress from spaces with doors that remain locked to control access to the space.


Fig. 2.1.B.1 Items blocking the corridor leading to the northwest exit from the print shop.

Fig. 2.1.B.2 Furniture being stored on the platform outside of the northwest exit from the print shop.


Fig. 2.1.B.3 Signage noted on the pair of exit doors leading to the fenced courtyard on the south end of the east side of the building.


Fig. 2.1.B.4 Exit sign noted at the ceiling in front of the vestibule leading to the pair of doors on the south end of the east side of the building.

Fig. 2.1.B.5 Gate located on the north side of the east courtyard.

Fig. 2.1.B.6 Gate located on the south side of the east courtyard.

Fig. 2.1.B.7 A bolt-style lock observed on a door leading from the Oil & Public Safety Lab to the west exit corridor.

**Recommendations:**

- Demolish the building structure, including the abatement of all asbestos, and rebuild as necessary to suit current needs. Test the building materials for asbestos prior to abatement.

OR, if the building cannot be demolished and must remain in use:

- Remove all furniture and equipment blocking access to the northwest exit from the print shop, including the furniture being stored outside of the exit. Keep these areas clear at all times per code requirements.
- Install appropriate hardware on the courtyard gates to allow access to a public way and remove the signs stating “NOT AN EMERGENCY EXIT” from the doors leading to the courtyard on the east side of the building.
- Remove manually operated flush bolts or surface bolts from any doors throughout, including the door leading from the Oil &Public Safety Lab to the west exit corridor. Any new locking devices or hardware must comply with code requirements.

## Fire Suppression Systems

The North Campus West Building is not equipped with an automatic sprinkler system.

**Recommendations:**

- Demolish the building structure, including the abatement of all asbestos, and rebuild as necessary to suit current needs. Test the building materials for asbestos prior to abatement.

OR, if the building cannot be demolished and must remain in use:

- Determine the greatest amount of hazardous materials present in the Oil &Public Safety Lab at any given time. If the quantities of the hazardous materials exceed the code-exempt amounts either remove any amounts greater than those allowed by code or install a fully automatic sprinkler system throughout and bring the building into compliance with the International Building Code (2012) and the National Fire Protection Association Standards for High-hazard Group H occupancies.

## Stairs and Ramps

The only stairway observed throughout the North Campus West Building is located at the northwest loading dock. It was noted that the stairway is not equipped with handrails and that the concrete is spalling along the outside edge, creating a potential tripping hazard (see Fig. 2.1.B.8). According to Section 1009.15 of the IBC (2012), stairways shall have handrails on each side and shall comply with Section 1012. The stairway appears to serve a change in level of approximately 28 inches and therefore does not require guards according to Section 1013.2. of the IBC (2012). According to Section 1009.9.1 of the IBC (2012), stairway treads and landings shall have a solid surface.

Fig. 2.1.B.8 The stairway at the northwest loading dock is not equipped with handrails as required by code.

**Recommendations:**

- Demolish the building structure, including the abatement of all asbestos, and rebuild as necessary to suit current needs. Test the building materials for asbestos prior to abatement.

OR, if the building cannot be demolished and must remain in use:

- Repair or replace the spalling or otherwise damaged concrete stairway at the northwest loading dock. Install handrails on both sides of the stairway per code requirements.

**Doors**

The majority of the doors throughout the building are equipped with lever-style door handles. A few of the exterior and interior doors throughout are equipped with knob-style door handles (see Fig. 2.1.B.9 and Fig. 2.1.B.10). 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.

Fig. 2.1.B.9 Typical knob-style door handle found on an exterior door.

Fig. 2.1.B.10 Typical knob-style door handle found on an interior door.

**Recommendations:**

- Demolish the building structure, including the abatement of all asbestos, and rebuild as necessary to suit current needs. Test the building materials for asbestos prior to abatement.

OR, if the building cannot be demolished and must remain in use:

- Replace any knob-style handles on the exterior and interior doors with lever-style handles.

**Security**

The majority of the North Campus West Building is secured by a gated fence with either barbed wire or razor wire along the top of the fence (see Fig. 2.1.B.11). Honeywell Security signs were observed at a few windows around the exterior of the building (see Fig. 2.1.B.12). The only doors that can be accessed outside of the fenced areas include the visitor's entrance near the middle of the west side of the building, a door that remains locked just to the north of the visitor's entrance, and the doors along the south side of the building.

The visitor's entrance off of the parking lot on the west side of the building is the means of public access to the building. This entrance is equipped with a key code entry system for employees and an intercom and buzzer system for visitors (see Fig. 2.1.B.13). An exterior security camera was noted to the south of the visitor's entrance near the top of the wall (see Fig. 2.1.B.13). There is a guard stationed inside of the entrance lobby behind glass. All visitors are required to check-in with the guard and must be escorted at all times by a permanent North Campus employee (see Fig. 2.1.B.14). The door leading from the visitor's entrance lobby to the rest of the building is equipped with a key code entry (see Fig. 2.1.B.15).

The remaining doors around the exterior of the building are either for employee access or for emergency exit only. The employee entrances were observed to be generally equipped with key code entry systems (see Fig. 2.1.B.16). The emergency exits were observed to have signs on the inside reminding employees to ensure that the doors lock upon exiting (see Fig. 2.1.B.17) and signs on the exterior noting that it is not an entrance (see Fig. 2.1.B.18).

There were a number of restricted areas observed throughout the interior of the building with "Do Not Enter" signs and key code entry systems (see Fig. 2.1.B.19 and Fig. 2.1.B.20). Security cameras were observed in a few areas throughout the interior of the building (see Fig. 2.1.B.21).

Fig. 2.1.B.11 South fence between the North Campus West Building and the North Campus East Building with barbed wire along the top.

Fig. 2.1.B.12 Honeywell Security sign observed on a few windows around the exterior of the building.

Fig. 2.1.B.13 Key code entry system and intercom/ buzzer system observed at the visitor's entrance on the west side of the building with a security camera noted south of the entrance.


Fig. 2.1.B.14 Visitors are required to check-in with the guard stationed behind glass inside of the visitor's entrance lobby and must be escorted by a permanent North Campus employee at all times.

Fig. 2.1.B.15 Key code entry system observed at the door leading from the visitor's entrance lobby to the rest of the building.

Fig. 2.1.B.16 Employee entrances are generally equipped with key code entry systems.

Fig. 2.1.B.17 Signs on the interior side of the emergency exits reminding employees to ensure that the doors lock upon exiting.

Fig. 2.1.B.18 Emergency exit equipped with a sign stating that the doors are not an entrance.


Fig. 2.1.B.19 Restricted areas observed throughout the interior of the building with “Do Not Enter” signs.

Fig. 2.1.B.20 Restricted areas observed throughout the interior of the building with key code entry systems.

Fig. 2.1.B.21 Typical security camera observed in areas throughout the interior of the building.

## 2.1-C GENERAL ACCESSIBILITY ISSUES

The two women's restrooms and the two men's restrooms provided in the North Campus West Building are non-accessible restroom facilities. These restrooms do not provide the minimum wheelchair accessible space and clearance requirements according to the plans provided by the Owner and do not provide wheelchair accessible toilet compartments. The only accessible restroom in the building is a unisex restroom located on the southwest side of the building. The unisex restroom provides accessible facilities for a single occupant's use. According to the plans provided by the Owner, this space appears to be large enough that it could be divided into

two separate accessible restrooms.

The drinking fountains throughout the building are not accessible. A piece of tubing was observed to be loosely placed on top of one of the fountains (see Fig. 2.1.C.1). Further, it was noted that the drinking fountains are not secured to the floor or wall and can be easily tipped forward, creating a potential life-safety hazard to users.

The sink observed in the Break Room on the south side of the building is not accessible (see Fig. 2.1.C.2).

Fig. 2.1.C.1 Typical non-accessible drinking fountain observed throughout the building and loose tubing observed on top of the fountain.

Fig. 2.1.C.2 Non-accessible sink observed in the Break Room on the south side of the building.

**Recommendations:**

- Demolish the building structure, including the abatement of all asbestos, and rebuild as necessary to suit current needs. Test the building materials for asbestos prior to abatement.

OR, if the building cannot be demolished and must remain in use:

- Replace non-accessible drinking fountains with accessible drinking fountains throughout.
- Remove the loose tubing on top of the drinking fountain noted above and provide appropriate drainage as necessary.
- Install accessible sinks in the Break Rooms throughout where possible.

## 2.1-D ELEVATORS

It is our understanding that there are no elevators in the North Campus West Building.

## 2.1-E ENVIRONMENTAL

It was reported that the North Campus West Building is known to have asbestos. It was reported that there are transite panels above and below the windows around the exterior of the building. Transite is an asbestos-cement product. It was reported that the drywall joint compound contains asbestos, although the gypsum board itself does not. Finally, it was reported that there are areas throughout the building with vinyl asbestos floor tile (VAT).

It was reported that the monocoat finish on the steel and decking tested negative for asbestos.

The fumes related to the Department of Labor & Employment's Oil & Public

Safety Lab are a safety and health concern. See 2.1-B Code Issues.

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

**Recommendations:**

- Demolish the building structure, including the abatement of all asbestos, and rebuild as necessary to suit current needs. Test the building materials for asbestos prior to abatement.

OR, if the building cannot be demolished and must remain in use:

- Test the building materials for asbestos and abate all asbestos throughout the building as necessary.
- 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 there are plans to replace the roof of the North Campus West Building.

It was reported that there are plans to renovate Room B-24. It was further reported that Room A-34 was in the process of being remodeled at the time of the site survey visit.

## 2.2 STRUCTURAL

### 2.2-A EXTERIOR BUILDING ENVELOPE

The exterior of the structure was in fair condition. The overhang at the west building entry showed evidence of water damage to a stucco infill piece, along with corrosion at the base of the metal panel skin (Fig. 2.2.A.1).

Fig. 2.2.A.1

There was some damage to the exterior metal panel skin, likely due to a vehicle colliding with the structure (Fig. 2.2.A.2). Exterior downspouts were observed to empty within 1'-0 of the building line (Fig. 2.2.A.2). From conversations with on-site personnel, at least one downspout and adjacent parking block had caused backflow and water damage to the interior of the building recently. The specific location we observed had been addressed in recent renovations.

Fig. 2.2.A.2

One section of break metal at a window overhang near the building's southwest corner was observed to be loose (Fig. 2.2.A.3).

Fig. 2.2.A.3

The upper course of brick at the southwest and southeast corners of the building has some loose bricks (Fig. 2.2.A.4 and 2.2.A.5), and the southwest corner appears to be missing some flashing elements.

Fig. 2.2.A.4

Fig. 2.2.A.5

Sealants at the joint between metal building structure and brick or masonry infill appears to have failed in most all observable locations (Fig. 2.2.A.6).

Fig. 2.2.A.6

Some cracks were observed in the brick at the south entry (Fig. 2.2.A.7).

Fig. 2.2.A.7

The base of posts supporting the canopy over the loading dock at the northwest corner of the building are corroding (Fig. 2.2.A.8).

Fig. 2.2.A.8

The stair at the northwest loading dock has no handrail, the adjacent downspout drains essentially on top of a canopy post base plate (contributing to corrosion), and the concrete stairs have spalled the majority of their corners (Fig. 2.2.A.9).

Fig. 2.2.A.9

**Recommendations:**

- Locations with corroded steel should be cleaned of all corrosion and painted with an exterior-grade coating. When possible, re-detailing at the intersection of finishes to grade should be considered to avoid "wicking" water up from grade.
- Increase the length of downspouts such that they empty at least 3'-0 from the building line, or add splashblocks of equivalent length.
- Replace damaged metal panels.
- Reattach the loose metal panel at the window canopy near the southwest corner.
- Loose bricks should be remortated into walls and related flashing details investigated for leaks.
- Exterior sealants should be removed and replaced.
- Cracks in the exterior brick should be routed and repointed.
- Add a handrail at the northwest loading dock stair, and repair the missing portions of the concrete steps.

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

## 2.2-B BUILDING INTERIOR

The structural framing that was readily observable is in fair condition. The majority of the steel framing appears to have been coated with some sort of thermal spray-on insulation. This coating prevented close examination of significant portions of the structure. The anchorage of this coating is beginning to fail, and subsequently small to medium pieces of insulation are falling from the structure. Exposed steel in the ceiling plenum appears to be corroding (Fig. 2.2.B.1). It is unknown if the corrosion is occurring only at exposed steel, or is the typical condition beneath the insulating coating.

Fig. 2.2.B.1

One section of interior partition framing has some cracking (Fig. 2.2.B.2). The observable partition framing above the ceiling in this location is fastened tight to the metal building structure. Given the Metal Building Manufacturer's Association's (MBMA's) drift and deflection limits for most engineered metal buildings, this cracking can likely be attributed to movement of the main building frame within its structural limit. The cracking observed is not a structural concern.

Fig. 2.2.B.2

Portions of suspended ceiling grid in the print shop are anchored directly to metal building frames. Some of the ceiling tiles are falling away from the supporting grid, and the grid itself appears to be distorted or loose in some locations (Fig. 2.2.B.3). . Given the Metal Building Manufacturer's Association's (MBMA's) drift and deflection limits for most engineered metal buildings, this condition can likely be attributed to movement of the main building frame within its structural limit. This movement is not a structural concern; however, dislodged ceiling tiles represent a potential hazard to workers or equipment below.

Fig. 2.2.B.3

The joint between partition framing and exterior brick infill at the northeast exit from the print room has cracked and measures approximately 0" at grade to over 3/4" at the ceiling (Fig. 2.2.B.4). This crack is telegraphed to the exterior of the building at the exit as well. Again, given the Metal Building Manufacturer's Association's (MBMA's) drift and deflection limits for most engineered metal buildings, this condition can likely be attributed to movement of the main building frame within its structural limit. The crack is not a structural concern, but presents a possible failure of the building's envelope.

Fig. 2.2.B.4

**Recommendations:**

- Perform additional investigations of the thermal spray insulation at the metal building frames to determine if corrosion is occurring behind the insulation.
- Provide for deflection compatibility where partition framing anchors to the metal building.
- Re-hang the ceiling partition grids such that deflections of the metal building frame do not introduce differential movement of the grid and subsequent dislodging of the panels.
- Re-detail the joint between the partition framing and brick infill at the print room's northeast exit.

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

## 2.2-C FALL PROTECTION

The roof of the building was sloped and no fall protection was provided. A fall protection system should be installed along the roof to meet current safety codes.

## 2.2-D PLANNED AND ON-GOING PROJECTS

N/A

## 2.3 CIVIL

### 2.3-A EXTERIOR BUILDING ENVELOPE/SITE

**General**

The State of Colorado North Campus contains three buildings originally considered “temporary” buildings; the west, north and east buildings. This assessment report covers the west building. The west building of the State of Colorado North Campus site is located at the northwest corner of East 62nd Avenue and Downing Street with an address of 1001 East 62nd Avenue in Denver, Colorado (Fig. 2.3.A.1). The building is bordered by the east building of the North Campus to the east, the north building of the campus to the north and a variety of industrial development to the south, and west. The first building on the North Campus site is approximately 2.46 acres. The existing site consists of the building, parking lot, a landscaped courtyard and street right-of-way including sidewalk and landscaping. The main building entrance is accessed from the south side (Fig. 2.3.A.2). The site surrounding the building is consistent with a building approximately 30 years old.

NOTE: Descriptions of existing infrastructure contained herein are based on public utility information provided by the North Washington Street Water and Sanitation District and Adams County. 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, i.e. Google Earth.


Figure 2.3.A.1 – West Building of North Campus Vicinity Map

Figure 2.3.A.2 – West Building, South Entrance

**Grading and Drainage**

The site slopes generally from west to east. The high point of the site is directly west of the building. Runoff drains overland to a series of pans and s collected by inlets north of the building. Storm sewer conveys collected runoff easterly and then northerly towards East 64th Avenue.

The main entrance to the building is located on the south side and is accessed via a concrete walkway (Fig. 2.3.A.3). There is a second entrance on the west side of the building that is accessed from the parking lot (Fig. 2.3.A.4). All the building entrances appear to meet ADA accessibility guidelines. Rock skirts and pavement line the perimeter of the building. The east side of the building features a fenced-in grass landscape courtyard.

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

Figure 2.3.A.3 –West Entrance Walkway

Figure 2.3.A.4 –West Entrance

Previous drainage studies are not available for this site at this time. It is assumed that drainage facilities and conveyances are designed for the 5-year and the 100-year rainfall events, per the Adams County Criteria. The site appears to ultimately discharge to the South Platte River.

The effective Flood Insurance Rate Map (FIRM Ma Number 08001C0611H, effective date March, 5, 2007) shows the property lies within Zone X, areas designated as outside of the 500-year floodplain. To our knowledge, there are no known existing flood control problems or drainage issues.

**Utility Services**

The building utility demands are unknown at this time. The building water service line appears to connect to a 6-inch water main located in East 62nd Avenue. The water main routes water easterly to Downing Street, then northerly towards East 64th Avenue. There is one fire hydrant located near the building. It is southeast of the building near the intersection of East 62nd Avenue and Downing Street. There are no known water pressure problems at this time.

The building is serviced by an 8-inch sanitary sewer line located in East 62nd Avenue. This line runs easterly to Downing Street, then northerly towards East 64th Avenue. There are no known sanitary sewer capacity problems at this time.

Existing storm sewer collects site runoff from two main inlets located on the northeast side of the site. These inlets collect site runoff from all three buildings. The inlets route runoff northerly within Downing Street towards East 64th Avenue. There are no known storm sewer problems at this time.

Existing dry and regulated utilities (electric and telecommunications) are assumed to be located in Downing Street and/or East 62nd Avenue.

**Site Paving**

Locations of broken concrete, concrete settling 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.5 – Site Concrete Crack, Recommended for Replacement

The site asphalt was noted to be in very poor condition (Fig. 2.3.A.6 and Fig. 2.3.A.7). Numerous locations of depressions and cracking were observed especially in the parking lot to the west. It is recommended that the entire site be re-graded and re-paved to improve the surface drainage and maintain the site posterity.

Figure 2.3.A.6 – Poor Site Asphalt Condition

Figure 2.3.A.7 – Poor Site Asphalt Condition

**Recommendations:**

- Concrete cracks approximately 1/8" wide or smaller showing no differential movement can be sealed using an approved joint sealant. Cracks should be routed and cleaned per an approved industry method prior to sealing.
- Concrete panels showing numerous excessive cracking and/or differential movement should be replaced.
- Replacement of concrete 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.
- Remove existing asphalt. Re-grade and re-surface the site with new asphalt for proper drainage.

## 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 by visual inspection and topography was evaluated using Google Earth. The landscaped areas to the south at the building entrance are generally slope away from the building. Current geotechnical recommendations and standard practice for slopes away

from the building are 10:1 for 10 feet and 2% in hardscape areas. The site generally appears to meet these slopes (Fig. 2.3.B.1). Ponding was observed at one location to the west of the building near the fence (Fig. 2.3.B.2). Ponding at this location is a minor concern. Stagnant water provides an opportunity for mold and mildew growth, which is slippery in a walking path. In the winter, the water will freeze and become ice. The standing water also creates more opportunity for asphalt cracking and deterioration. It is recommended that this area be re-graded and re-paved to provide positive drainage.

Figure 2.3.B.1 – Building Perimeter, Slopes Away

Figure 2.3.B.2 – Standing Water

**Recommendations:**

- Re-grade and re-pave site to re-establish drainage paths.
- Install area drains at low points and where proper slopes cannot be met.

## 2.3-C PLANNED AND ON-GOING PROJECTS

There are no known site planned and on-going projects at this time.

## 2.4 MECHANICAL, ELECTRICAL, AND PLUMBING

### 2.4-A OVERVIEW OF EXISTING SYSTEMS

**ELECTRICAL SYSTEMS**

The power for this building is provided by Xcel energy supplied through a set of three 100kVA transformers for a total of 300kVA (see Fig. 2.4.A.1). These transformers feed a 480V, 400amp switch that feeds the rest of the building (see Fig. 2.4.A.2).

The main electrical room is by the main building entrance; it contains some disconnect switches for the rooftop heating and cooling units and a few panelboards (see Fig. 2.4.A.3). A secondary electrical room is located in the mail room production area (see Fig. 2.4.A.4).

Fig. 2.4.A.1 – Utility transformer


Fig. 2.4.A.2 – Main electrical Service Entrance Disconnect

Fig. 2.4.A.3 – Main electrical room panelboards

Fig. 2.4.A.4 – Secondary electrical room

**Recommendations:**

- The electrical load capacity feeding this building appears to be less than other buildings of this size and use. Verify with the utility company the peak demand and assess if the service is adequately sized. If found to be undersized, full power upgrade may be required to meet the current use of the building.

## Lighting

The lighting system throughout the building consists of a combination of linear T8 fluorescent and recessed T8 fluorescent fixtures (see Fig. 2.4.A.5, Fig. 2.4.A.6, and Fig. 2.4.A.7). Some of the fixtures appear to be in good working condition and others appear to be in poor working condition and need to be replaced.

No automatic lighting controls were observed. The parking lot and exterior lighting are a combination of newer LED and older metal halide luminaire (see Fig. 2.4.A.8 and Fig. 2.4.A.9).

Emergency lighting is provided twin-head wall packs with batteries located throughout the building. The exit signs appear to be in good condition.

Fig. 2.4.A.5 – Recessed luminaire

Fig. 2.4.A.6 – Recessed lensed luminaire

Fig. 2.4.A.7 – Hallway lensed luminaires

Fig. 2.4.A.8 – LED Pole luminaire

Fig. 2.4.A.9 – Wall mounted LED luminaires

**Recommendations:**

- Automatic lighting controls are recommended throughout the building. This would conserve energy in the offices, storage, hallways, break, and conference rooms. Some of the older luminaires should be updated. We recommend replacing the fluorescent luminaires with LED luminaires as project budgets allow. LED luminaires have more control options such as dimming, individual controls, and daylighting. LED luminaires also reduce maintenance cost.

## Fire Alarm

The fire alarm system appears to be an older Fire Lite system with full detection and pull stations (see Fig. 2.4.A.10 and Fig. 2.4.A.11). The devices are functional. The faculty's staff member stated during the walk that this system needs to be replaced to be brought up to the new standard Notifier fire alarm system.


Fig. 2.4.A.10 – Fire alarm control panel

Fig. 2.4.A.11 – Smoke detector

**Recommendations:**

- Fire alarm replacement is recommended. Since Notifier is the standard system for the state, it is recommended to provide this system as an upgrade.

**General Power**

Most receptacles appear to be in good working order; however, some of the spaces have receptacles that are in bad condition (see Fig. 2.4.A.12 and Fig. 2.4.A.13).

Fig. 2.4.A.12 – GFI receptacle

Fig. 2.4.A.13 – Receptacle not connected to wall

**Recommendations:**

- Replace all receptacles that are past their useful life.

**Fuel Testing and Storage Room**

The fuel testing room is the only facility used to test the fuel provided at fuel stations that is state owned. Two model A one cylinder engines are used to test the fuel in one room on the south side of the building (see Fig. 2.4.A.14). The storage room contains some flammable storage cabinets that are vented. Some fuel is stored in the fuel testing room either in a refrigerator or in cans. The refrigerator and the storage cans are not vented. It was reported that up to 40 gallons can be stored at any time (Fig. 2.4.A.15). During the site visit a strong smell of fuel was observed in this room.
The 2011 National electrical code provides requirements for motor fuel dispensing and storage. Since gasoline has flammable gases and vapors having a flash point of less than 100 degrees Fahrenheit, the code indicates this room or parts of the room shall be rated for Class I Division I, Group D and Class I Division II, Group D. These ratings require the electrical systems including conduit, receptacles, light fixtures, fire alarm devices, disconnects, and switches to all be in rated enclosures. To eliminate any static electricity, an ESD floor and grounding system should need to be installed as well. The low voltage devices in this room would need to be in rated enclosures. An emergency power off button to turn the power off in the room is also required. Refer to the mechanical sections for ventilation and fire protection requirements and architectural sections for building construction requirements.

Fig. 2.4.A.14 – Fuel testing engine

Fig. 2.4.A.15 – Fuel tank

**Recommendations:**

- Further investigate the Fuel Testing and Storage Room to determine the rating of the room. If rated equipment is required, this will help increase the safety in the building.

**Printing, Binding, and Paper Cutting Production Area**

The printing and binding production area serves as a mail production area with large printers, a binding machine and other paper product uses (see Fig. 2.4.A.16). During the site visit it was reported that the amount of dust produced in the space was high. For example, the heat detectors were installed instead of smoke detectors because smoke detectors would get dirty to fast. There was also evidence that a transformer located in the space was modified to prevent dust from getting inside. If the paper dust levels are high enough, the 2011 National Electrical Code provides the requirements for areas that have combustible dust, such as Cellulose which is the major constituent of paper. Since Cellulose has an ignition temperature of 500 degrees Fahrenheit, a large collection of it could spark. The electrical system including conduit, receptacles, light fixtures, fire alarm devices, disconnects, panelboards, and transformers would all need to be rated for the environment (see Fig. 2.4.A.17). One way to keep dust down is having a good routine of housekeeping. A monthly cleanup of the space with a dust collecting materials would help keep the space from getting a buildup of combustible dust. Refer to the mechanical sections for ventilation and fire protection requirements and architectural sections for building construction requirements.

Fig. 2.4.A.16 – Printing area

Fig. 2.4.A.17 – Transformer in printing area

**Recommendations:**

- Further investigation of the Printing, Binding, and Paper Cutting Production Area to determine the rating of the room. It is recommended a good routine of housekeeping ensure that combustible dust does not accumulate on the electrical gear. This will help increase the safety in the building.
- The transformer that was modified in the Printing area to keep the dust out may not have the sufficient cooling required for the load. If dust is building up in the unit provide one that is rated for the environment.

## MECHANICAL SYSTEMS

The HVAC system for the building consists of several constant volume gas fired DX rooftop units serving each zone (see Fig. 2.4.A.14). Approximately

fifteen RTUs are provided to condition the spaces. Some of the original Lennox units have been replaced with new Trane units. The new units are installed on existing curbs using curb adaptors. The installation of these units needs to be reviewed for the current code wind load requirement (see Fig. 2.4.A.18). The older units have condenser fins damaged and are at the end of their useful life. These units should be replaced with new efficient units (see Fig. 2.4.A.15 and Fig. 2.4.A.16). The gas piping is routed on the roof. The piping is rusted and need cleaning and painting (see Fig. 2.4.A.17). The gas connection to some RTU needs to be verified as it appears the connection has been tapped directly from pipe serving other RTY (see Fig. 2.4.A.20).

The ventilation in the entrance/reception of the building appears to be inadequate. Also no central heat is provided in the area. Portable electric heaters are used to heat the space (see Fig. 2.4.A.19). The cooling system serving the production area appears to be undersized. The space temperature appeared to be warmer than other spaces. Some window air conditioners have been installed to meet the operating condition (temperature) of the machines (see Fig. 2.4.A.24 and 25).

The lab area is served by a dedicated RTU and fume hoods are exhausted via roof mounted exhaust fans. There are no controls provided for the fume hood and they operate twenty-four seven (see Fig. 2.4.A.21). The chemical cabinets in the lab areas are vented via exhaust fans which operate twenty-four seven. There is no redundant ventilation system provided for the lab and exhaust system for the chemical cabinets (see Fig. 2.4.A.23). The ventilation in the fuel testing lab needs to be verified to meet current code requirements. Higher ventilation rates may be provided to keep the fuel odors migrating to other spaces (see Fig. 2.4.A.22).

The air distribution in the spaces is via wall or ceiling mounted supply diffusers and return air grilles. Electric baseboard heating is provided for supplemental heating in the perimeter zones. There is no air supply (circulation) in the corridors and the main entrance area.

The building has a separate domestic water connection. Domestic hot water is generated by two gas fired water heaters located on the first floor. The building is not sprinklered. The production area does not have any other fire suppression system. This area has significant amount of combustible material (see Fig 2.4.A.26).

Fig. 2.4.A.14 – Rooftop units

Fig. 2.4.A.15 – Original RTU

Fig. 2.4.A.16 – Condenser fins damaged

Fig. 2.4.A.17 – Gas piping on roof

Fig. 2.4.A.18 – New Trane unit installation

Fig. 2.4.A.19 – Portable heater for entrance

Fig. 2.4.A.20 – Gas piping connection at RTU

Fig. 2.4.A.21 – Fume hood in lab

Fig. 2.4.A.22 – Gasoline testing lab


Fig. 2.4.A.23 – Chemical storage area

Fig. 2.4.A.24 – Printing area

Fig. 2.4.A.25 – Printing area

Fig. 2.4.A.30 – Overall production area

**Recommendations:**

- The condenser fins of the Lennox RTUs are damaged. These units are at the end of their useful life. Replace these units with new efficient RTUs.
- Gas piping on the roof is not painted. Paint the gas piping.
- Verify installation of new Trane unit is as required by current code for wind load.
- There is no air distribution in the main entrance and lobbies. A portable heater is being used to keep the space warm. Provide a RTU to condition entrance areas and lobbies.
- Verify gas piping sizing. It appears gas connection for another gas appliance is tapped from RTU dirt leg.
- Verify ventilation in the fuel testing lab meets the current code requirements. Provide enough ventilation to prevent gasoline odors from migrating to other spaces.
- Consider providing controls for the fume hoods and associated exhaust fans. This will reduce exhaust in the space and save on energy costs.
- Verify amount of flammable liquid stored at is within code allowed quantity for the building construction type.
- It appears there is no redundant fan provided for the chemical cabinet exhaust system. Provide controls and an audio visual alarm to indicate if the system fails or is not in operation.

- Provide controls to maintain visual indication that the lab space is kept at negative pressure. This will help the end users and facilities personnel to confirm that the ventilation system in the lab area is operating as designed.
- Verify the cooling load of the production area, taking into account the heat generated by the machines (printers, photo copiers, graphics machine, mail sorting machine etc.).
- The production process involves a lot of printing, copying and sorting of the mail. This area needs to have adequate ventilation and to exhaust to control fine paper, carbon particles etc. generated during production.
- There is no fire suppression system in the production area. This area has significant amount of combustible material.

## 2.4-B CODE ISSUES

### ELECTRICAL CODE ISSUES

Both electrical rooms need to have all their penetrations sealed to provide a one hour rating. In the case of a fire, current conditions would allow the fire to spread quickly through the building (see Fig. 2.4.B.1 and Fig. 2.4.B.2).

Fig. 2.4.B.1 – No sealed penetrations in electrical room

Fig. 2.4.B.2 – No sealed penetrations in electrical room


Fig. 2.4.B.3 – “Not an emergency exit” labeling


Fig. 2.4.B.4 – Exit sign

**Recommendations:**

- Ensure all interior fire rated walls have all penetrations sealed properly.
- The door that exits into the courtyard between the west building and the east building has an exit sign but is labeled “Not an Emergency Exit” (see Fig. 2.4.B.3 and Fig. 2.4.B.4). Either the exit sign needs to be removed or the label needs to be removed. Refer to architectural section for egress requirements.

**MECHANICAL CODE ISSUES**

The ventilation system in the lab areas needs to be verified.

## 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 VOICE AND DATA INFRASTRUCTURE

**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 West building.

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

**Telecommunications Rooms (i.e. Spaces)**

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

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

2. Telecommunications Rooms (IDFs)

- A minimum of one (1) telecommunications room (i.e. IDF rooms) will need to be installed on each floor and should be vertically stacked, floor-to-floor. Buildings with larger floor plates may require a second IDF room on each floor, vertically stacked as a second riser within the building.
- The IDF rooms shall be a minimum of 10' x 12' in size, capable of supporting the installation of one row of four (4) equipment racks.

3. Telecommunications Room Locations

- The TIA Standards requires one IDF room per floor and it shall be located as close as possible to the center of the area being served, preferably in the core area.
- Additional IDF rooms are required per floor when the floor area served exceeds 10,000 square feet or the horizontal distribution distance to the field device or telecom outlet exceeds 295 feet (or 90 meters).
- Telecommunications rooms should not share a common wall with an electrical room due to potential electromagnetic interference (EMI) issues. If it is imperative due to constraints to place both of these rooms adjacent, then a double wall with a 1-foot internal separation should be considered or the layout of the electrical room should preclude mounting of equipment on the common wall.

**Telecommunications Pathways (i.e. Conduit/Raceways)**

1. Backbone Pathways

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

2. Horizontal Pathways

- Telecommunications pathways will need to be installed from telecom

outlets and IP field devices to the IDF room serving the floor.

- Provide cable tray on each floor within the accessible ceiling spaces of the main corridors as the primary pathways from IDF rooms to telecommunications outlets and field devices.
- Cable tray shall be ladder type aluminum tray with a 9" rung spacing and a width of 18 inches in main corridors and 12 inches in secondary cable tray segments. Cable trays shall be 4 inches in depth.
- 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 from the back box to the main telecom distribution pathways.

**Telecommunications Cabling**

1. Telecommunications Backbone Cables

- Furnish and install a 24-strand singlemode fiber cable and a 24-strand multimode fiber cable from the MDF room to each IDF room in the building. The multimode fiber cable will be OM4 50 micron laser optimized optical fiber.
- Install fiber optic cable in a 1-1/4" innerduct end to end.
- Furnish and install a 50-pair or 100-pair copper backbone cable from the MDF room to each IDF room in the building.

2. Telecommunications Horizontal Cabling

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

3. Cabling within Single Occupancy Offices

- Provide a minimum of two telecommunications outlets, located on

opposite walls, each with two data jacks. Install two Category 6 horizontal cables to each outlet from the IDF room serving the area.

4. Wireless Access Points (WAPs)

- For ceiling mounted WAPs, install two Category 6 horizontal cables to each WAP from the IDF room serving the area.
- Provide WAPs at 20-45-foot spacing or at an average of 25 foot spacing on 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 building related to the existing voice/data IT/Telecommunications Infrastructure.

**Recommendations:**

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

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

## 2.5-C PLANNED AND ON-GOING PROJECTS

It is our understanding there are no known planned and/or on-going IT/ Telecommunications Infrastructure projects for the West building 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 consideration should be given to the investigation of a site security plan. It was also 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 operations and provide a safe and secure environment for persons and assets within the West building. The purpose of this recommendations report is to provide a description of electronic security system parameters which would provide a safe and secure environment for all those persons and assets within the facilities. It is intended to provide valuable information to both technical and non-technical readers for ongoing coordination with security program requirements.

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

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

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

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

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

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

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

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

Fixed point duress buttons may be located at designated points within the building, for staff use in emergency situations. Duress alarm buttons should be provided where appropriate, typically at public interface counters and other locations as designated. Duress alarm buttons may be interfaced to the security alarm management system, or intrusion alarm system, and report to a central monitoring station if required.

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

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

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

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

Access controlled doors:

- Main entry
- Suite entries on each floor
- IDF rooms, recommended
- Sensitive spaces

Intrusion alarms:

- Access controlled doors

- Emergency egress only doors
- Perimeter doors

Intercom stations:

- Main entry, recommended
- Receiving dock door, recommended

Duress alarms:

- Public interface counters
- Cash handling locations
- Loading docks

Video surveillance cameras:

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

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

for network and security cabling types and jacket color must be adhered to. Security cabling should never be exposed and should be contained in protective conduit wherever cable is accessible to vandalism, accidental damage, or where it traverses any unsecured space. Security cabling shall be plenum rated where required by codes.

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

Basic Security Conduit requirements:

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

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

## 2.6-B CODE ISSUES

**Findings**

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

**Recommendations:**

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

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

## 2.6-C PLANNED AND ON-GOING PROJECTS

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

# 3.0 FLOOR-BY-FLOOR ASSESSMENT FINDINGS AND RECOMMENDATIONS

## 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**

It was reported that there are plans to renovate Room B-24. It was further reported that Room A-34 was in the process of being remodeled at the time of the site survey visit.

**Ceiling Finishes**

The majority of the ceilings throughout the North Campus West Building are 2x4 acoustic ceilings in fair to poor condition overall. General sagging of the 2x4 acoustic ceilings and the individual tiles was observed in areas throughout the building, especially throughout the Integrated Document Solutions (IDS) Print Shop (see Fig. 3.0.C.1, Fig. 3.0.C.2, and Fig. 3.0.C.3). General deterioration, damage, and soiling of the acoustic ceiling tiles was observed throughout (see Fig. 3.0.C.4 through Fig. 3.0.C.8).

The material covering a beam along the ceiling of the office space located at the southern central portion of the building was observed to be cracked and damaged (see Fig. 3.0.C.9).

The open ceiling throughout the north loading dock and storage room was observed to have deteriorating spray-on insulation (see Fig. 3.0.C.10).

Fig. 3.0.C.1 Sagging, soiled, and deteriorating 2x4 acoustic ceilings observed in areas of the building.

Fig. 3.0.C.2 Sagging and deteriorating 2x4 acoustic ceilings observed throughout the IDS Print Shop.

Fig. 3.0.C.3 Sagging of the individual 2x4 acoustic ceiling tiles observed throughout the IDS Print Shop.

Fig. 3.0.C.4 Typical instance of deterioration of the 2x4 acoustic ceiling observed during the site survey visit.

Fig. 3.0.C.5 Typical instance of a cracked 2x4 acoustic ceiling tile observed during the site survey visit.

Fig. 3.0.C.6 General deterioration of the acoustic ceiling noted throughout.

Fig. 3.0.C.7 Typical instance of soiled and deteriorating 2x4 acoustic ceiling tiles with evidence of water damage observed throughout the building.

Fig. 3.0.C.8 Soiled and deteriorating 2x4 acoustic ceiling tiles with evidence of water damage observed in the IDS Print Shop.

Fig. 3.0.C.9 Cracked and damaged material covering a beam observed at the ceiling in the office space located at the southern central portion of the building.

Fig. 3.0.C.10 Open ceiling observed with deteriorating spray-on insulation in the north loading dock and storage room.

**Wall Finishes**

The gypsum board walls throughout the majority of the building are in fair condition overall with areas of wear-and-tear, damage, and deterioration noted (see Fig. 3.0.C.11, Fig. 3.0.C.12, and Fig. 3.0.C.13). The gypsum board was observed to be cracking in a few locations throughout the building and is likely due to settlement and movement of the structure (see Fig. 3.0.C.14, Fig. 3.0.C.15, and Fig. 3.0.C.16). It was reported that the drywall joint compound contains asbestos but that the gypsum board itself does not.

A few areas included in the site survey visit were noted to have laminated wood paneling in fair to poor condition with general wear-and-tear and damage observed (see Fig. 3.0.C.17 and Fig. 3.0.C.18).

General wear-and-tear to the wood trim throughout the building was observed during the site survey visit (see Fig. 3.0.C.19).

The vinyl baseboard was noted to be deteriorating and coming loose from the wall in areas throughout the building (see Fig. 3.0.C.20).

Fig. 3.0.C.11 Wear-and-tear and cracking of the gypsum board wall observed in the northeast entry vestibule.

Fig. 3.0.C.12 Deterioration of the gypsum board observed during the site survey visit.

Fig. 3.0.C.13 Typical wear-and-tear noted at the gypsum board walls throughout.

Fig. 3.0.C.14 A cracked section of the gypsum board wall observed near the Oil & Gas Lab exit door on the south side of the building.

Fig. 3.0.C.15 Cracking of the gypsum board walls observed above some of the door openings throughout.

Fig. 3.0.C.16 Cracking of the gypsum board walls observed near the ceiling in areas throughout the building.

Fig. 3.0.C.17 General wear-and-tear and damage noted to the laminated wood paneling throughout the areas included in the site survey visit.

Fig. 3.0.C.18 Extensive damage to the laminated wood paneling wainscoting and the gypsum board wall observed in the north loading dock and storage room.

Fig. 3.0.C.19 General wear-and-tear to the wood trim observed in areas throughout the building.

Fig. 3.0.C.20 Deteriorating vinyl baseboard observed in areas throughout the building.

**Floor Finishes**

The vinyl tile flooring throughout the majority of the building is in fair to poor condition overall with wear-and-tear, soiling, and damage noted during the site survey visit (see Fig. 3.0.C.21, Fig. 3.0.C.22, and Fig. 3.0.C.23). An area of the vinyl tile flooring was observed to be buckling during the site survey visit (see Fig. 3.0.C.24). The vinyl tile flooring throughout the IDS Print Shop was noted to be in especially poor condition with spalling and missing tiles creating a potential tripping hazard (see Fig. 3.0.C.25). It was reported that there are areas throughout the building with vinyl asbestos floor tile (VAT).

The vinyl sheet flooring throughout the building is in fair to poor condition

overall with general deterioration noted, especially along the seams of the flooring. The vinyl sheet flooring throughout Room B-9: Women's Restroom was noted to be in especially poor condition with extensive deterioration. The seams of the vinyl flooring throughout the restroom have been taped down and are creating a potential tripping hazard (see Fig. 3.0.C.26 and Fig. 3.0.C.27).

The carpet observed throughout areas included in the site survey visit is in fair to poor condition overall with areas of deterioration due to age, soiling, and carpet pulling loose along the seams and creating a potential tripping hazard (see Fig. 3.0.C.28, Fig. 3.0.C.29, and Fig. 3.0.C.30).

Fig. 3.0.C.21 Damaged vinyl tile flooring observed throughout the building.

Fig. 3.0.C.22 Deteriorating and soiled vinyl tile flooring observed throughout the building.

Fig. 3.0.C.23 Extensive soiling observed at areas of the vinyl tile floors.

Fig. 3.0.C.24 An area of the vinyl tile flooring observed to be buckling during the site survey visit.

Fig. 3.0.C.25 The vinyl tile flooring throughout the IDS Print Shop is in poor condition with spalling and missing tiles creating a potential tripping hazard.

Fig. 3.0.C.26 The vinyl sheet flooring in Room B-9: Women's Restroom is in especially poor condition with deterioration and taped seams observed throughout.

Fig. 3.0.C.27 The deterioration of the seams of the vinyl sheet flooring in Room B-9: Women's Restroom is creating a potential tripping hazard.

Fig. 3.0.C.28 General deterioration and soiling observed at the carpet flooring throughout.

Fig. 3.0.C.29 Carpet seams that have come loose and are creating a potential tripping hazard.

Fig. 3.0.C.30 Deterioration of the carpet seams observed during the site survey visit are creating a potential tripping hazard.

**Other**

The doors throughout are in fair to poor condition overall with general wear-and-tear and damage to the doors and the frames noted (see Fig. 3.0.C.31, Fig. 3.0.C.32, and Fig. 3.0.C.33). It was reported that renovation/refinishing/replacements of the doors is on the Capitol Complex list of controlled maintenance projects that need to be addressed.

An exit sign appears to be inadequately secured to the ceiling above the exit on the east end of the south side of the building and poses a potential life-safety hazard to building occupants who pass underneath (see Fig. 3.0.C.34).

Fig. 3.0.C.31 General wear-and-tear observed at the doors throughout.

Fig. 3.0.C.32 Wear-and-tear observed at a door frame during the site survey visit.

Fig. 3.0.C.33 Extensive damage observed at a wood door and frame during the site survey visit.


Fig. 3.0.C.34 An inadequately secured exit sign observed at the exit on the east end of the south side of the building poses a life-safety hazard to building occupants who pass underneath.

**Recommendations:**

- Demolish the building structure, including the abatement of all asbestos, and rebuild as necessary to suit current needs. Test the building materials for asbestos prior to abatement.

OR, if the building cannot be demolished and must remain in use:

- Test the building materials for asbestos, including the drywall joint compound and vinyl floor tile, and abate all asbestos throughout as necessary.
- Continue with the plans to completely remodel Room B-24 and Room A-34.
- Replace the 2x4 acoustic ceilings throughout.
- Determine the cause of the cracking material covering the beam along the ceiling of the office space noted above and repair as necessary. Repair or replace the damaged material.
- Replace the metal panels at the open ceiling throughout the north loading dock and storage room with new metal panels and insulation as part of the roof replacement recommended in 2.1-A Exterior Building Envelope/Site.
- Repair or replace any deteriorating or damaged gypsum board walls throughout. Replace any gypsum board walls where removed for abatement. Determine the cause of cracking gypsum board walls and repair as necessary.
- Repaint the gypsum board walls throughout.

- Repair or replace the worn and damaged laminated wood paneling throughout.
- Repair or replace the worn and damaged wood trim throughout.
- Repair or replace the deteriorating vinyl baseboard throughout.
- Replace all vinyl tile flooring and vinyl sheet flooring throughout. Repair the flooring substrate as necessary prior to installing new vinyl tile or vinyl sheet flooring. Determine the cause of soiling in the areas with extensive soiling and repair as necessary.
- Replace all carpet throughout. Repair the flooring substrate as necessary prior to installing new carpet flooring.
- Refurbish all interior doors and door frames and replace all knob-style door handles with lever-style handles. Replace any doors and door frames with extensive damage and as necessary.
- Reattach the loose exit sign at the exit on the east end of the south side of the building to provide a secure connection to the ceiling.

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### 3.0-D STRUCTURAL

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

SM&W
SHEN MILSOM WILKE

### 3.0-E VOICE AND DATA

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

## 3.0-F SECURITY SYSTEMS

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

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# 4.0 LEVELS OF RENOVATION NEEDED

| Building: North Campus: West Building, 1001 East 62nd Avenue (Denver) | | | | | |
|---|---|---|---|---|---|
| Priority | Main System | Sub System | Level of Renovation Needed | | |
| | | | Minimal | Moderate | Extensive |
| 1 | Code | Occupancy Issues | | | √ |
| 1 | Exterior Enclosure | Windows | | | √ |
| 1 | Exterior Enclosure | Roof | | | √ |
| 1 | Exterior Enclosure | Fall Protection (roof) | | | √ |
| 1 | Exterior Enclosure | Walls | | | √ |
| 1 | Exterior Enclosure | Sealant / Grout | | | √ |
| 1 | Infrastructure | HVAC | | | √ |
| 1 | Infrastructure | Lighting | | | √ |
| 1 | Infrastructure | Fire Alarm | | | √ |
| 1 | Infrastructure | Fire Sprinkler | | | √* |
| 1 | Infrastructure | Tele/Com | | | √ |
| 1 | Interior | Finishes - Flooring | | | √ |
| 1 | Interior | ADA-Drinking Fountains | | | √ |
| 1 | Interior | ADA-Sinks (Break Rooms) | | | √ |
| 1 | Interior | Finishes Ceiling | | | √ |
| 1 | Interior | Finishes - Wall | | | √ |
| 1 | Interior | Doors | | | √ |
| 1 | Site | Drainage | | | √ |
| 1 | Site | Pavement | | | √ |
| 1 | Code | Exits | | √ | |
| 2 | Exterior Enclosure | Doors | | √ | |
| 2 | Infrastructure | Power | | √ | |
| 2 | Infrastructure | Security Access/IDS | | √ | |
| 2 | Infrastructure | Security Video | | √ | |
| 2 | Site | Lighting | | √ | |
| 3 | Code | Exit Stairways | √ | | |
| 3 | Infrastructure | Structural Framing | √ | | |
| 3 | Interior | ADA-Door Levers | √ | | |
| | Code | Dead End Corridors | | | |
| | Environmental | Asbestos | (present, per Owner) | | |
| | Exterior Enclosure | Penthouse | | | |
| | Exterior Enclosure | Signage | | | |
| | Infrastructure | Elevator(s) | | | |
| | Interior | ADA-Restrooms | | | |
| | Site | Utilities | | | |

* An approved fully automatic sprinkler system must be installed **if** a High-hazard Group H occupancy exists within the building. See 2.1-B Code Issues.

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# 5.0 COST ESTIMATES

## SUMMARY OF SUMMARIES

| Item No. | Description | SF | Total | $/SF |
|---|---|---|---|---|
| 1 | 6321 Downing - North Campus West Bldg | 37,763 | 4,517,442 | 119.63 |
| 2 | Contingency on Above | | w/ Above | |
| | **Subtotals:** | **37,763** | **4,517,442** | **120** |
| 3A | IT \ Teledata (Relocate Exstg Only) | 37,763 | 56,163 | 1.49 |
| 3B | Move Management | | Excluded | |
| 3C | Flex Space | | Excluded | |
| 3D | Public Art | | Excluded | |
| 4 | Contingency on Above | | Excluded | |
| | **Equipment \ Art Subtotal:** | | **56,163** | **1** |
| | **Base Price \ Equipment \ Art Subtotal:** | | **4,573,605** | **121** |
| 5 | Escalation - 6.75% per year | | Excluded | |
| 6 | Contingency on Above | | Excluded | |
| | **Escalation Subtotal:** | | **Excluded** | |
| | **Base Price \ Equipment \ Art Subtotal:** | | **4,573,605** | **121** |
| 7 | Design Fees at 8% per State of CO Direction | | 365,888 | 9.69 |
| 8 | Contingency on Above | | Excluded | |
| | **Design Fee Subtotal:** | | **365,888** | **9.69** |
| | **Base Price \ Equipment \ Art \ Design Fee Subtotal:** | | **4,939,494** | **131** |

| | | |
|---|---|---|
| **PROJECTED COST OF CONSTRUCTION IN 2014 DOLLARS** | **4,939,494** | **131** |

| ADD-ALTERNATES | | | | |
|---|---|---|---|---|
| 9 | FF&E (FF&E SF & $25\SF Allowance per Architect) | 30,736 | 768,400 | 25.00 |
| 10 | Move Management | | Excluded | |
| 11 | Escalation - 6.75% per year | | Excluded | |
| 12 | Contingency on Above | | Excluded | |
| | **Subtotals:** | | **768,400** | |
| | **ADD-ALTERNATES SUBTOTAL:** | | **768,400** | **25** |

## SYSTEM BY SYSTEM SUMMARY

| Item No. | Description | SF | Total | $/SF |
|---|---|---|---|---|
| 1A | Fix/Correct Fuel Testing Room Code Issues | 37,763 | 189,661 | 5.02 |
| 1B | Escalation | | Excluded | |
| **System 1 Fuel Room Code Issues Subtotal:** | | | **189,661** | **5** |
| 2A | Fix/Correct Printer Room Code Issues | 37,763 | 202,396 | 5.36 |
| 2B | Escalation | | Excluded | |
| **System 2 Printer Room Code Subtotal:** | | | **202,396** | **5** |
| 3A | Replace Fire Alarm & Fire Sprinkler | 37,763 | 289,938 | 7.68 |
| 3B | Escalation | | Excluded | |
| **System 3 Fire Alarm & Sprinkler Subtotal:** | | | **289,938** | **8** |
| 4A | Replace Roof | 37,763 | 565,523 | 14.98 |
| 4B | Escalation | | Excluded | |
| **System 4 Roof Replacement Subtotal:** | | | **565,523** | **15** |
| 5A | Replace HVAC | 37,763 | 687,552 | 18.21 |
| 5B | Escalation | | Excluded | |
| **System 5 HVAC Replacement Subtotal:** | | | **687,552** | **18** |
| 6A | Balance of Project Scope | 37,763 | 3,073,052 | 81.38 |
| 6B | Escalation | | Excluded | |
| **System 6 Balance of Scope Subtotal:** | | | **3,073,052** | **81** |
| **System by System Total Project 2014 Dollars Subtotal:** | | | **5,008,124** | **133** |
| 7 | IT \ Teledata (Relocate Exstg Only) | | 56,163 | 1.49 |
| 8 | Move Management | | Excluded | |
| 9 | Flex Space | | Excluded | |
| 10 | Public Art | | Excluded | |
| 11 | Contingency on Above | | Excluded | |
| **Equipment \ Art Subtotal:** | | | **56,163** | **1** |
| **Systems \ Equipment \ Art Subtotal:** | | | **5,064,286** | **134** |
| 12 | Design Fees at 8% per State of CO Direction | | 405,143 | 10.73 |
| 13 | Contingency on Above | | Excluded | |
| **Design Fee Subtotal:** | | | **405,143** | **11** |
| **Base Price \ Equipment & Art \ Design Fee Subtotal:** | | | **5,469,429** | **145** |

| | | |
|---|---|---|
| **PROJECTED COST OF CONSTRUCTION IN 2014 DOLLARS** | **5,469,429** | **145** |

| ADD-ALTERNATES | | | | |
|---|---|---|---|---|
| 14 | FF&E (FF&E SF & $25\SF Allowance per Architect) | 30,736 | 768,400 | 25.00 |
| 15 | Move Management | | Excluded | |
| 16 | Escalation - 6.75% per year | | Excluded | |
| 17 | Contingency on Above | | Excluded | |
| | **Subtotals:** | | **768,400** | |
| | **ADD-ALTERNATES SUBTOTAL:** | | **768,400** | **25** |

## DETAILED ESTIMATE - SUMMARY

| | | | | 37,763 |
|---|---|---|---|---|
| **Item No.** | **Description** | **$/SF** | **Total** | **Total w/Burdens** |
| | | | | |
| DIV 2 | EXISTING CONDITIONS | 1.45 | 54,588 | 78,815 |
| DIV 3 | CONCRETE | 2.40 | 90,631 | 130,854 |
| DIV 4 | STONE & MASONRY | | 12,500 | |
| DIV 5 | METALS | 2.15 | 81,359 | 117,468 |
| DIV 6 | WOODS & PLASTICS | 3.78 | 142,567 | 205,839 |
| DIV 7 | THERMAL PROTECTION | 11.51 | 434,650 | 627,552 |
| DIV 8 | OPENINGS, DOORS, WINDOWS | 1.48 | 56,000 | 80,853 |
| DIV 9 | FINISHES | 10.91 | 412,163 | 595,086 |
| DIV 10 | SPECIALITIES | | 19,160 | |
| DIV 11 | EQUIPMENT | | EXCLUDED | |
| DIV 12 | FURNISHINGS | | EXCLUDED | |
| DIV 13 | SPECIAL CONSTRUCTION | | EXCLUDED | |
| DIV 14 | CONVEYING SYSTEMS | | EXCLUDED | |
| DIV 21 | FIRE SUPPRESSION | 3.63 | 137,080 | 197,917 |
| DIV 22 | PLUMBING | 0.53 | 20,000 | 28,876 |
| DIV 23 | HVAC | 15.81 | 597,038 | 862,009 |
| DIV 26 | ELECTRICAL | 14.78 | 558,032 | 805,692 |
| DIV 27 | COMMUNICATIONS | 2.72 | 102,715 | 148,302 |
| DIV 31 | EARTHWORK | | EXCLUDED | |
| DIV 32 | EXTERIOR IMPROVEMENTS | 10.87 | 410,350 | 592,468 |
| DIV 33 | UTILITIES | | EXCLUDED | |
| DIV 34 | TRANSPORTATION | | EXCLUDED | |
| | | | | |
| | **Subtotal Direct Construction Costs** | **82.85** | **3,128,833** | **4,517,442** |
| | Allowance for Historical / Memorial Markers | | 0 | |
| | **Direct Cost Subtotal with GFP** | **82.85** | **3,128,833** | |
| | **Material Testing** | 0.35% | 10,951 | |
| | **Owner's Design & Preconstruction Contingency** | 10.00% | 312,883 | |
| | **Owner's Construction Contingency (after NTP)** | 5.00% | 156,442 | |
| | **Permits** | 1.90% | 59,448 | |
| | **Total Direct Construction Costs** | **97.15** | **3,668,557** | |
| | **Standard General Conditions (GC's Onsite Overhead)** | | 490,681 | |
| | **Subtotal NET Construction Cost** | **110.14** | **4,159,238** | |
| | **GC's Off-Site Overhead & Profit** | 4.60% | 191,325 | |
| | **GC's General Liability Insurance** | 0.90% | 37,433 | |
| | **Construction Cost w/o Bonds & Escalation** | **116.20** | **4,387,996** | |
| | **Builder's Risk Insurance** | 1.50% | 65,820 | |
| | **Performance & Payment Bond** | 1.20% | 52,656 | |
| | **Bid Bond** | 0.25% | 10,970 | |
| | **Tap Fees** | | Excluded | |
| | **Bidding Reserves** | | Excluded | |
| | **Total Estimated Cost of Construction** | **119.63** | **4,517,442** | |

## DETAILED ESTIMATE

| | |
|---|---|
| **Estimate By:** | Kyle Hoiland |
| **Date:** | 23-Apr-14 |
| **Reviewed By:** | Chris Squadra |
| **Date:** | 23-Apr-14 |

**Building GSF:** 37,763 **Total Cost:** $3,128,833

| DIV 02 | Description | Quantity | Unit | TOTALS Cost/Unit | TOTALS Total Cost |
|---|---|---|---|---|---|
| | **EXISTING CONDITIONS / BUILDING DEMOLITION** | | | | |
| | Remove Existing Metal Siding & Insulation | 13,992 | SF | 1.40 | 19,588 |
| | Asbestos Testing & Abatement (Allowance) | 1 | LS | 35,000.00 | 35,000 |
| | **SUBTOTAL EXISTING CONDITIONS/DEMOLITION** | | | | **54,588** |

| DIV 03 | Description | Quantity | Unit | TOTALS Cost/Unit | TOTALS Total Cost |
|---|---|---|---|---|---|
| | **CONCRETE / FOUNDATIONS** | | | | |
| | Repair Concrete Cracking & Spalling @ Interior Slabs / Concrete Walls / Stairs | 18,882 | SF | 4.80 | 90,631 |
| | **SUBTOTAL FOUNDATIONS** | | | | **90,631** |

| DIV 04 | Description | Quantity | Unit | TOTALS Cost/Unit | TOTALS Total Cost |
|---|---|---|---|---|---|
| | **MASONRY** | | | | |
| | Exterior Brick Veneer Repair, where necessary | 1 | AL | 10,000.00 | 10,000 |
| | Recaulk Exterior Stone Masonry | 500 | LF | 5.00 | 2,500 |
| | **SUBTOTAL MASONRY** | | | | **12,500** |

| DIV 05 | Description | Quantity | Unit | TOTALS Cost/Unit | TOTALS Total Cost |
|---|---|---|---|---|---|
| | **METALS** | | | | |
| | New Metal Siding | 13,992 | SF | 4.80 | 67,159 |
| | Replace Existing Guardrails & Railings (Allowance) | 24 | LF | 175.00 | 4,200 |
| | Repair & Repaint Corroded Steel Locations (Allowance) | 1 | AL | 10,000.00 | 10,000 |
| | **SUBTOTAL METALS** | | | | **81,359** |

| DIV 06 | Description | Quantity | Unit | TOTALS Cost/Unit | TOTALS Total Cost |
|---|---|---|---|---|---|
| | **WOODS** | | | | |
| | Rough Carpentry Wood Materials for Safety & Repairs | 37,763 | SF | 2.25 | 84,967 |
| | Rough Carpentry Labor | 1,200 | HRS | 48.00 | 57,600 |
| | **Time & materials for miscellaneous building shoring, safety railings/barricades, blocking, substrate repairs* | | | | |
| | **SUBTOTAL WOODS** | | | | **142,567** |

| DIV 07 | Description | Quantity | Unit | TOTALS Cost/Unit | TOTALS Total Cost |
|---|---|---|---|---|---|

| | THERMAL & MOISTURE PROTECTION | | | | |
|---|---|---|---|---|---|
| | | | | | |
| | Remove & Replace Roof System | 37,763 | SF | 9.60 | 362,525 |
| | Metal Siding, Fascia, Flashings, & Trims Repair (Allowance) | 1 | AL | 15,000.00 | 15,000 |
| | Scuppers, Gutters & Downspouts Repairs (Allowance) | 1 | AL | 10,000.00 | 10,000 |
| | Envelope & Insulation Repairs @ Impacted Areas | 1 | AL | 15,000.00 | 15,000 |
| | Stucco Repair (Allowance) | 750 | SF | 9.50 | 7,125 |
| | Miscellaneous Caulking & Sealants @ Interior & Exterior | 5,000 | LF | 5.00 | 25,000 |
| | New Concrete Epoxy Sealer Throughout | | | | Excluded |
| | | | | | |
| | **SUBTOTAL THERMAL** | | | | **434,650** |

| DIV 08 | Description | Quantity | Unit | TOTALS | |
|---|---|---|---|---|---|
| | | | | Cost/Unit | Total Cost |
| | **OPENINGS** | | | | |
| | | | | | |
| | Door Replacement As Needed (Allowance) | 16 | EA | 500.00 | 8,000 |
| | Hardware Replacement As Needed (Allowance) | 16 | EA | 1,000.00 | 16,000 |
| | Windows Replacement As Needed (Allowance) | 1 | LS | 32,000.00 | 32,000 |
| | | | | | |
| | **SUBTOTAL OPENINGS** | | | | **56,000** |

| DIV 09 | Description | Quantity | Unit | TOTALS | |
|---|---|---|---|---|---|
| | | | | Cost/Unit | Total Cost |
| | **INTERIOR FINISHES** | | | | |
| | | | | | |
| | Gyp Bd Wall Patching | 18,882 | SF | 1.10 | 20,770 |
| | Gyp Bd Ceiling Patching | 5,664 | SF | 3.10 | 17,560 |
| | ACT Ceiling Repair / Tile Replacement | 28,322 | SF | 3.21 | 90,914 |
| | Gyp Bd Detailing @ Int Soffits, Cols, etc. | 1 | LS | 2,500.00 | 2,500 |
| | Replace Carpet (assumed 33% of floor area) | 12,462 | SF | 3.28 | 40,875 |
| | Clean/Repair Natural Stone/Tile Flooring | | | | Excluded |
| | Repair/Replace VCT | 25,301 | SF | 1.80 | 45,542 |
| | Vinyl Base | 1,943 | LF | 2.20 | 4,275 |
| | Clean/Repair Natural Stone/Tile @ Walls | | | | Excluded |
| | Paint Gyp Bd Walls & Ceilings w/2 Coats Latex | 24,546 | SF | 0.60 | 14,728 |
| | Miscellaneous Painting Allowance | 1 | LS | 25,000.00 | 25,000 |
| | ADA Compliance Modifications (Allowance) | 1 | AL | 25,000.00 | 25,000 |
| | Repair or Replace Millwork (wall panels, trim, etc.) (Allowance) | 1 | AL | 25,000.00 | 25,000 |
| | New ESD Floor (Allowance) | 1 | AL | 25,000.00 | 25,000 |
| | Rated Room Upgrade - Fuel Testing Room (Allowance) | 1 | AL | 25,000.00 | 25,000 |
| | Rated Room Upgrade - Paper Production Area (Allowance) | 1 | AL | 50,000.00 | 50,000 |
| | | | | | |
| | **SUBTOTAL INTERIOR FINISHES** | | | | **412,163** |

| DIV 10 | Description | Quantity | Unit | TOTALS | |
|---|---|---|---|---|---|
| | | | | Cost/Unit | Total Cost |
| | **SPECIALITIES** | | | | |
| | | | | | |
| | Move Items Blocking Egress Path | 40 | HRS | 35.00 | 1,400 |
| | New Bath Hardware | | | | Excluded |
| | Fire Extinguishers (2 per floor) | | | | Excluded |
| | Corner Guards | | | | Excluded |
| | Code Required Signage | 50 | EA | 55.20 | 2,760 |
| | Wayfinding Signage | 1 | AL | 15,000.00 | 15,000 |
| | Access Ladders | | | | Excluded |
| | | | | | |
| | **SUBTOTAL SPECIALTIES** | | | | **19,160** |

| | | | | TOTALS |
|---|---|---|---|---|
| | | | | |

| DIV 11 | Description | Quantity | Unit | Cost/Unit | Total Cost |
|---|---|---|---|---|---|
| | EQUIPMENT | | | | |
| | SUBTOTAL EQUIPMENT | | | | EXCLUDED |

| DIV 12 | Description | Quantity | Unit | TOTALS | |
|---|---|---|---|---|---|
| | | | | Cost/Unit | Total Cost |
| | FURNISHINGS | | | | |
| | SUBTOTAL FURNISHINGS | | | | EXCLUDED |

| DIV 13 | Description | Quantity | Unit | TOTALS | |
|---|---|---|---|---|---|
| | | | | Cost/Unit | Total Cost |
| | SPECIAL CONSTRUCTION | | | | |
| | SUBTOTAL SPECIAL CONSTRUCTION | | | | EXCLUDED |

| DIV 14 | Description | Quantity | Unit | TOTALS | |
|---|---|---|---|---|---|
| | | | | Cost/Unit | Total Cost |
| | CONVEYING SYSTEMS | | | | |
| | SUBTOTAL CONVEYING SYSTEMS | | | | EXCLUDED |

| DIV 21 | Description | Quantity | Unit | TOTALS | |
|---|---|---|---|---|---|
| | | | | Cost/Unit | Total Cost |
| | FIRE SUPPRESSION | | | | |
| | | | | | |
| | Fire Sprinklers - Full Replacement | 37,763 | SF | 3.63 | 137,080 |
| | Backflow Prevention | | | | Excluded |
| | FDC | | | | Excluded |
| | Booster Pump (Allowance) | | | | Excluded |
| | | | | | |
| | SUBTOTAL FIRE SUPPRESSION | | | | 137,080 |

| 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) | 4 | EA | 2,500.00 | 10,000 |
| | Insulation @ Lavatory & Mechanical Piping | 1 | AL | 10,000.00 | 10,000 |
| | | | | | |
| | SUBTOTAL PLUMBING | | | | 20,000 |

| DIV 23 | Description | Quantity | Unit | TOTALS | |
|---|---|---|---|---|---|
| | | | | Cost/Unit | Total Cost |
| | HVAC | | | | |
| | | | | | |
| | HVAC - Full Replacement | 37,763 | SF | 12.50 | 472,038 |
| | HVAC - Venting at Fuel Testing Room (Allowance) | 1 | AL | 45,000.00 | 45,000 |
| | HVAC - Venting at Paper Production Area (Allowance) | 1 | AL | 75,000.00 | 75,000 |
| | Upgrade HVAC Controls at Fuel Testing Room (Allowance) | 1 | AL | 5,000.00 | 5,000 |
| | | | | | |
| | SUBTOTAL HVAC | | | | 597,038 |

| DIV 26 | Description | Quantity | Unit | TOTALS | |
|---|---|---|---|---|---|
| | | | | Cost/Unit | Total Cost |
| | **ELECTRICAL** | | | | |
| | | | | | |
| | Demo Existing Electrical Outlets & Replace | 37,763 | SF | 1.00 | 37,763 |
| | Upgrade Existing Panels | 37,763 | SF | 4.20 | 158,605 |
| | New Electrical Wiring & Conduit @ New Lighting | 37,763 | SF | 2.98 | 112,534 |
| | Remove Light Fixtures throughout Building | 37,763 | SF | 1.00 | 37,763 |
| | Automated Lighting Controls/Sensors | 37,763 | SF | 1.80 | 67,973 |
| | Replace Light Fixtures w/ LED | 37,763 | SF | 2.50 | 94,408 |
| | Grounding System at Fuel Testing Room | 1 | LS | 15,000.00 | 15,000 |
| | Replace Emergency GenSet | | | | Excluded |
| | UPS System | | | | Excluded |
| | Solar Photovoltaic System | | | | Excluded |
| | Wind Turbine System | | | | Excluded |
| | Replace Lightning Protection System | 37,763 | SF | 0.90 | 33,987 |
| | | | | | |
| | **SUBTOTAL ELECTRICAL** | | | | **558,032** |

| DIV 27 | Description | Quantity | Unit | TOTALS | |
|---|---|---|---|---|---|
| | | | | Cost/Unit | Total Cost |
| | **DATA / COMMUNICATIONS** | | | | |
| | | | | | |
| | Fire Alarm System - New System | 37,763 | SF | 1.80 | 67,973 |
| | Data & Communications Conduit - Bring up to Code | 37,763 | SF | 0.92 | 34,742 |
| | Data & Communications Equipment | | | | Excluded |
| | A/V Equipment | | | | Excluded |
| | | | | | |
| | **SUBTOTAL COMMUNICATIONS** | | | | **102,715** |

| DIV 032 | Description | Quantity | Unit | TOTALS | |
|---|---|---|---|---|---|
| | | | | Cost/Unit | Total Cost |
| | **SITE IMPROVEMENTS** | | | | |
| | | | | | |
| | | | | | |
| | **Paving** | | | | |
| | Minor Grading for New Paving | 1 | LS | 45,000.00 | 45,000 |
| | Remove & Replace Existing Asphalt Road around Bldg | 80,000 | SF | 4.22 | 337,600 |
| | Concrete Replacement at Sidewalks | 3,500 | SF | 6.50 | 22,750 |
| | 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 |
| | Irrigation Repair | | | | Excluded |
| | | | | | |
| | **SUBTOTAL SITE IMPROVEMENTS** | | | | **410,350** |

| 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 -** | | | | **3,128,833** |
| | | | | **83** |

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