REGULAR MEETING AGENDA
City of Black Hawk City Council
211 Church Street, Black Hawk, CO
March 8, 2017
3:00 p.m.

RINGING OF THE BELL:

1. CALL TO ORDER:

2. ROLL CALL & PLEDGE OF ALLEGIANCE:

3. ADENDA CHANGES:

4. CONFLICTS OF INTEREST: (Council disclosures are on file w/City Clerk & Sec. of State)

5. INTRODUCTION OF NEW EMPLOYEES: Taylor Davis, Police Officer
                                           Amy Gresham, Communications Officer
                                           Hayden Ragsdale, Firefighter

6. PUBLIC COMMENT: Please limit comments to 5 minutes

7. APPROVAL OF MINUTES: February 22, 2017 Regular Meeting

8. PUBLIC HEARINGS:
   A. CB4, An Ordinance Approving a Memorandum of Agreement Among the Bureau of Land Management, Royal Gorge Field Office, the Colorado State Historic Preservation Officer, and the City of Black Hawk Regarding the Sale of 6.42 Acres of BLM-Administered Land

9. ACTION ITEMS:
   A. Resolution 19-2017, A Resolution Approving a Job Description For a Civil Engineer

10. CITY MANAGER REPORTS:

11. CITY ATTORNEY:

12. EXECUTIVE SESSION:

13. ADJOURNMENT:

MISSION STATEMENT
The mission of the City of Black Hawk is to progressively provide cost effective programs and services of the highest quality to the community.
Officer Davis began her career with the Black Hawk Police Department in November 2016 and recently completed training. Taylor graduated from Thunder Ridge High School in 2006 and then attended the University of Wyoming earning a Bachelor of Arts in Criminal Justice. She worked for the Walt Disney Company from 2010-2013 and was then hired by the San Diego Sheriff’s Department where she worked for three years. In 2016 she moved back to Colorado to be near her family. She was honored to be chosen to work for the Black Hawk Police Department where she feels there is a sense of community and a welcoming atmosphere. Taylor is an avid Bronco’s fan and enjoys spending time with her family and active dogs which keep her very busy.
Communication Officer Gresham began her career with the city of Black Hawk as a Dispatcher in November and recently completed training. She was born in Nebraska and raised in Canada until she was seven (7) years old. She then moved with her family moved to the Arvada/Westminster area. Amy’s passion lies within the Law Enforcement environment and she has been fortunate to work in this field for the last 18 years. Amy had always hoped to work in the mountains in the Law Enforcement field. She looks forward to her career with the City of Black Hawk and striving to become a valued employee for the city and community.
CITY OF BLACK HAWK NEW EMPLOYEE INTRODUCTION

HAYDEN RAGSDALE
FIREFIGHTER

I was born in Denver and grew up in Leadville, after high school I went to College of DuPage in Glen Ellen Illinois where I got my EMT. I moved back to Colorado and attended Colorado Mountain College where I studied Fire Science; I graduated with an associate’s degree in 2014. During my time in college I worked as a ski patroller at Keystone Ski Resort. In 2015 I was hired as a Resident Firefighter with Vail Fire Department. I spent one year with Vail Fire, and then in 2016 I was hired with the City of Black Hawk as a firefighter. In my off time I enjoy hunting, fishing and snowboarding.
Deputy City Clerk Michele Martin rang the bell.

1. CALL TO ORDER: The regular meeting of the City Council was called to order on Wednesday, February 22, 2017, at 3:00 p.m. by Mayor Spellman.

2. ROLL CALL: Present were: Mayor Spellman, Aldermen Armbright, Bennett, Johnson, Midcap, Moates, and Torres.

Staff present: City Attorney Hoffmann, City Manager Lewis, Police Chief Cole, Fire Chief Taylor, City Clerk/Administrative Services Director Greiner, Finance Director Hillis, Public Works Director Isbester, Community Planning and Development Administrator Linker, and Deputy City Clerk Martin.

PLEDGE OF ALLEGIANCE: Mayor Spellman led the meeting in the recitation of the Pledge of Allegiance.

3. AGENDA CHANGES: Deputy City Clerk Martin confirmed there were no agenda changes.

4. CONFLICTS OF INTEREST: City Attorney Hoffmann asked Council to declare any Conflicts of Interest on any issue appearing on the agenda this afternoon other than those previous disclosures and conflicts that have already been disclosed and are on file with the City Clerk and Secretary of State. There were no conflicts noted from City Council.

City Attorney Hoffmann asked the audience if there were any objections to any member of Council voting on any issue on the agenda this afternoon. The audience had no objections.

5. PUBLIC COMMENTS: Deputy City Clerk Martin confirmed that no one had signed up to speak.

MOTION TO APPROVE
Alderman Bennett MOVED and was SECONDED by Alderman Johnson to approve the Minutes as presented.

MOTION PASSED
There was no discussion and the motion passed unanimously.

7. PUBLIC HEARINGS:
None

8. ACTION ITEMS:

A. Resolution 17-2017, A Resolution Approving the City of Black Hawk Purchasing Policy

Mayor Spellman read the title.

Finance Director Hillis introduced this item. This would serve as the City’s formal policy. He said the City Manager was previously given the authority to sign off on amounts of $35,000, which was set ten years ago. He said the amount has slightly increased to $50,000 to accommodate for existing costs.

MOTION TO APPROVE
Alderman Bennett MOVED and was SECONDED by Alderman Moates to approve Resolution 17-2017, A Resolution Approving the City of Black Hawk Purchasing Policy.

MOTION PASSED
There was no discussion and the motion PASSED unanimously.

9. CITY MANAGER REPORTS:
City Manager Lewis asked the Canyon Casino’s “Butt Busting Champs” to join him up front for the presentation of the travelling Golden Sneaker Award. He said for the past few years the City has offered a ten-week Wellness Program over the holidays. He was pleased to announce another win for Canyon Casino and congratulated the team to a round of applause.

10. CITY ATTORNEY:
City Attorney Hoffmann had nothing to report.
11. EXECUTIVE SESSION: City Attorney Hoffmann recommended items number 1 and 2 for Executive Session for specific legal issues related to potential legislation.

MOTION TO ADJOURN INTO EXECUTIVE SESSION

Alderman Bennett MOVED and was SECONDED by Alderman Johnson to adjourn into Executive Session at 3:08 p.m. to hold a conference with the City’s attorney to receive legal advice on specific legal questions, pursuant to C.R.S. § 24-6-402(4)(b) and to consider the purchase, acquisition, lease, transfer or sale of real, personal or other property, pursuant to C.R.S. § 24-6-402(4)(a).

MOTION PASSED

There was no discussion and the motion PASSED unanimously.

MOTION TO ADJOURN

Alderman Bennett MOVED and was SECONDED by Alderman Johnson to adjourn the Executive Session at 3:58 p.m.

MOTION PASSED

There was no discussion and the motion PASSED unanimously.

12. ADJOURNMENT:

Mayor Spellman declared the Regular Meeting of the City Council closed at 3:58 p.m.

____________________________
Melissa A. Greiner
City Clerk

____________________________
David D. Spellman
Mayor
COUNCIL BILL 4
ORDINANCE 2017-4
AN ORDINANCE APPROVING
A MEMORANDUM OF
AGREEMENT AMONG THE
BUREAU OF LAND
MANAGEMENT, ROYAL
GORGE FIELD OFFICE, THE
COLORADO STATE
HISTORIC PRESERVATION
OFFICER, AND THE CITY
OF BLACK HAWK
REGARDING THE SALE OF
6.42 ACRES OF BLM-
ADMINISTERED LAND
STATE OF COLORADO
COUNTY OF GILPIN
CITY OF BLACK HAWK

COUNCIL BILL NUMBER: CB4
ORDINANCE NUMBER: 2017-4


BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF BLACK HAWK, GILPIN COUNTY:

Section 1. The City of Black Hawk hereby approves the Memorandum of Agreement among the Bureau of Land Management, Royal Gorge Field Office, the Colorado State Historic Preservation Officer, and the City of Black Hawk Regarding the Sale of 6.42 Acres of BLM-Administered Land as more particularly described in Exhibit A, attached hereto and incorporated herein by this reference, and authorizes the Mayor to execute the same on behalf of the City.

Section 2. Safety Clause. The Board of Aldermen hereby finds, determines, and declares that this Ordinance is promulgated under the general police power of the City of Black Hawk, that it is promulgated for the health, safety, and welfare of the public, and that this Ordinance is necessary for the preservation of health and safety and for the protection of public convenience and welfare. The Board of Aldermen further determines that the Ordinance bears a rational relation to the proper legislative object sought to be attained.

Section 3. Severability. If any clause, sentence, paragraph, or part of this Ordinance or the application thereof to any person or circumstances shall for any reason be adjudged by a court of competent jurisdiction invalid, such judgment shall not affect application to other persons or circumstances.

Section 4. Effective Date. The City Clerk is directed to post the Ordinance as required by the Charter. This Ordinance shall become effective upon posting by the City Clerk.

READ, PASSED AND ORDERED POSTED this 8th day of March, 2017.

_____________________________
David D. Spellman, Mayor

ATTEST:

____________________
Melissa A. Greiner, City Clerk
SUBJECT: Approve an Ordinance authorizing the Mayor to execute the Memorandum of Agreement among the Bureau of Land Management (BLM), the Colorado State Historic Preservation Officer (SHPO) and the City of Black Hawk regarding the sale of 6.42 acres of BLM administered land.

RECOMMENDATION:
If City Council chooses to approve Ordinance 2017-4, the recommended motion is as follows: “Approve Ordinance 2017-4, an Ordinance approving a Memorandum of Agreement among the Bureau of Land Management, Royal Gorge Field Office, the Colorado State Historic Preservation Officer, and the City of Black Hawk regarding the sale of 6.42 acres of BLM-administered land.”

SUMMARY AND BACKGROUND OF SUBJECT MATTER:
The City of Black Hawk has been in ongoing negotiations with the BLM since 2013 to purchase property in Chase Gulch. The 6.42 acres consists of four BLM parcels that lie within the footprint of Quartz Valley Reservoir. The MOA will advance the historic and cultural survey and mitigation for the four parcels.

FUNDING SOURCE: 501-3151-4607418
System Improvements/ EIS & EA

WORKSHOP DATE: March 08, 2017

ORIGINATED BY: James Ford

STAFF PERSON RESPONSIBLE: James Ford

PROJECT COMPLETION DATE: March 31, 2022

DOCUMENTS ATTACHED: Memorandum of Agreement

CITY ATTORNEY REVIEW: [ ]Yes [ ]No [ ]N/A INITIALS__________

SUBMITTED BY: REVIEWED BY:
Thomas Isbester, Public Works Director Jack D. Lewis, City Manager
MEMORANDUM OF AGREEMENT AMONG THE BUREAU OF LAND
MANAGEMENT, ROYAL GORGE FIELD OFFICE, THE COLORADO STATE
HISTORIC PRESERVATION OFFICER,
AND THE CITY OF BLACK HAWK
REGARDING THE SALE OF 6.42 ACRES OF BLM-ADMINISTERED LAND

WHEREAS, the Bureau of Land Management (“BLM”) plans to sell four parcels of BLM-administered land (“undertaking”) in Gilpin County to the City of Black Hawk (“Black Hawk”); and

WHEREAS, BLM has defined the undertaking’s area of potential effect (“APE”) as the acreage depicted on the map in Attachment 1, comprising 6.42 acres; and

WHEREAS, BLM has determined that the undertaking may have an adverse effect on Sites 5GL726, 5GL781, 5GL1509.1, and 5GL1509.2, which are eligible for listing in the National Register of Historic Places, and has received concurrence from the Colorado State Historic Preservation Officer (“SHPO”) pursuant to 36 C.F.R. part 800, of the regulations implementing Section 106 of the National Historic Preservation Act (54 U.S.C. § 306108) and the Colorado Protocol Agreement; and

WHEREAS, BLM has invited the Gilpin County Historical Society to participate in determining the appropriate resolution of adverse effects, and it has accepted; and

WHEREAS, BLM has consulted the Apache Tribe of Oklahoma, Cheyenne and Arapaho Tribes of Oklahoma, Cheyenne River Sioux Tribe, Comanche Nation of Oklahoma, Crow Creek Sioux, Eastern Shoshone, Jicarilla Apache Nation, Kiowa Tribe of Oklahoma, Northern Arapaho Tribe, Northern Cheyenne Tribe, Northern Ute Tribe, Oglala Sioux Tribe, Rosebud Sioux Tribe, Southern Ute Tribe, Standing Rock Lakota Tribe, and the Ute Mountain Ute Tribe, and no concerns were identified; and

WHEREAS, pursuant to the National Programmatic Agreement among the BLM, the Advisory Council on Historic Preservation (“ACHP”) and the National Conference of State Historic Preservation Officers, the undertaking does not meet the threshold for ACHP notification;

NOW, THEREFORE, BLM, SHPO, and Black Hawk agree that a remedy will be implemented in accordance with the following stipulations in order to mitigate the effect of the undertaking on historic properties.
A. STIPULATIONS

Prior to the sale of the land, BLM will ensure that the following measures are carried out:

1. **Cliff Extension Mine (Site 5GL781):** Using a consultant with the appropriate qualifications and a BLM Cultural Resource Use Permit (“CRUP”) in good standing, Black Hawk will record the site to Historic American Buildings Survey/Historic American Engineering Record (“HABS/HAER”) standards and prepare the documentation for transmittal to the Library of Congress. Unless otherwise agreed to by HABS/HAER, BLM will ensure that all documentation is completed and accepted by HABS/HAER, prior to disposal; and

2. **Advance Mine (Site 5GL726):** Using a consultant with the appropriate qualifications and a BLM CRUP in good standing, Black Hawk will record the site to Level II standards, as detailed in “Historic Resource Documentation Standards for Level I, II and III Documentation” (as described in OAHP Publication 1595) (“Level II Standards”); and

3. **Roads in the Quartz Valley Road Network with Supporting Status (5GL1509.1, and 5GL1509.2):** Using a consultant with the appropriate qualifications and a BLM CRUP in good standing, Black Hawk will record the roads to Level II Standards; and

4. **Historic Landscape Documentation and Interpretive Plan Development:**
   a. Using a consultant with the appropriate qualifications and a BLM CRUP in good standing, Black Hawk will establish the Quartz Valley Historic Landscape (“QVHL”), by identifying its boundaries, then completing and submitting the appropriate OAHP documentation (e.g., site forms, maps) to the BLM and OAHP; and

   b. Using a consultant with the appropriate qualifications, Black Hawk will develop a plan for interpretation of the QVHL, incorporating information about all of the historic properties associated with the proposed land sale, and allowing for the addition of other historic properties in the landscape. The QVHL interpretive plan may be incorporated into a relevant existing plan.

   c. The interpretive plan should include elements such as those described in Section 5.2 of the National Park Service Director’s Order #6 for Comprehensive Interpretive Planning (CIP), including:
      i. A long-range interpretive plan defining a 5- to 10-year vision for the QVHL’s program that addresses all media and personal services;
      ii. An annual implementation plan, charting the short-range actions which will achieve the long-range vision; and,
      iii. An interpretive database supporting the pursuit of that vision

5. All materials produced by consultants will be subject to BLM and SHPO review and acceptance.

6. The QVHL interpretive plan will be submitted to BLM and SHPO for review within three (3) years of execution of this MOA.
B. MONITORING AND REPORTING

Each year following the execution of this MOA until it expires or is terminated, on or before December 1, BLM will provide all parties to this MOA a summary report detailing work undertaken pursuant to its terms. Such report will include the annual interpretive implementation referenced in Stipulation A.4.c., any scheduling changes proposed, any problems encountered, and any disputes and objections received in BLM's efforts to carry out the terms of this MOA.

C. DISPUTE RESOLUTION

1. Should any signatory to this MOA object at any time to any actions proposed or the manner in which the terms of this MOA are implemented, BLM will consult with such party to resolve the objection. If BLM determines that such objection cannot be resolved, BLM will:

   a. Forward all documentation relevant to the dispute, including the BLM's proposed resolution, to the ACHP. The ACHP will provide BLM with its advice on the resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, BLM will prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, signatories and concurring parties, and provide them with a copy of this written response. BLM will then proceed according to its final decision.

   b. If the ACHP does not provide its advice regarding the dispute within the thirty (30) day time period, BLM may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, BLM will prepare a written response that takes into account any timely comments regarding the dispute from the signatories and concurring parties to the MOA, and provide them and the ACHP with a copy of such written response.

2. BLM's responsibility to carry out all other actions subject to the terms of this MOA that are not the subject of the dispute remain unchanged.

D. AMENDMENTS

This MOA may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the date a copy signed by all of the signatories is filed with the ACHP.
E. DURATION

1. This MOA will be null and void if its terms are not carried out within five (5) years from the date of its execution. Prior to such time, BLM may consult with the other signatories to reconsider the terms of the MOA and amend it in accordance with Section D.

2. This MOA will automatically terminate when BLM and SHPO are satisfied that the stipulations have been met.

3. BLM will notify all parties to this agreement, in writing, when this MOA has terminated.

F. EARLY TERMINATION

1. If any signatory to this MOA determines that its terms will not or cannot be carried out, that party will immediately consult with the other parties to attempt to develop an amendment per Section F, above.

2. If within thirty (30) days (or another time period agreed to by all signatories) an amendment cannot be reached, any signatory may terminate the MOA upon written notification to the other signatories.

3. Once the MOA is terminated, and prior to work continuing on the undertaking, BLM must either
   (a) execute an MOA pursuant to 36 CFR § 800.6; or
   (b) request, take into account, and respond to the comments of the ACHP under 36 CFR § 800.7.

4. BLM will notify the signatories as to the course of action it will pursue.

Execution of this MOA by the BLM, SHPO and Black Hawk, and implementation of its terms, evidence that BLM has taken into account the effects of this undertaking on historic properties and afforded the ACHP an opportunity to comment.
Cultural Resource Survey Black Hawk
Water Supply Land Sale Parcels
Gilpin County, Colorado

Sections 1, 2, 11, and 12 T3S, R73W
USGS Central City 1964, CO Quad.
Gilpin County, Colorado

Attachment 1
Project Location

Prepared for: The City of Black Hawk and the BLM,
Royal Gorge Field Office
File: BLM Figure 1.mxd (CB)
September 2015

INVITED SIGNATORIES:

CITY OF BLACK HAWK

__________________________
David D. Spellman, Mayor of the City of Black Hawk    Date
RESOLUTION 18-2017
A RESOLUTION APPROVING A CERTIFICATE OF APPROPRIATENESS FOR THE FULL EXTERIOR REHABILITATION AND SITE WORK FOR THE PROPERTY LOCATED AT 241 DuBOIS STREET
STATE OF COLORADO
COUNTY OF GILPIN
CITY OF BLACK HAWK

Resolution No. 18-2017

TITLE: A RESOLUTION APPROVING A CERTIFICATE OF APPROPRIATENESS FOR THE FULL EXTERIOR REHABILITATION AND SITE WORK FOR THE PROPERTY LOCATED AT 241 DuBOIS STREET

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF BLACK HAWK, COLORADO, THAT:

Section 1. The City Council hereby determines to approve the Certificate of Appropriateness for the full exterior rehabilitation and site work for the property located at 241 DuBois Street.

RESOLVED AND PASSED this 8th day of March, 2017.

_______________________________
David D. Spellman, Mayor

ATTEST:

______________________________
Melissa A. Greiner, City Clerk
NOTICE OF PUBLIC HEARING

Notice is hereby given that the City of Black Hawk Board of Aldermen shall hold a public hearing concerning a Certificate of Appropriateness for full exterior rehabilitation and site improvements at 241 Dubois Street, located on property described in Exhibit A and generally located along Dubois Street, pursuant to the City of Black Hawk zoning ordinance.

The public hearing is to be held before the City of Black Hawk Board of Aldermen on Wednesday, March 8, 2017 at 3:00 p.m. or as soon as possible thereafter. The public hearing shall be held in the City of Black Hawk Council Chambers located at 211 Church Street, Black Hawk, Colorado, 80422, or at such other time or place in the event these hearings are adjourned.

ALL INTERESTED PARTIES
MAY ATTEND

Melissa A. Greiner
City Clerk

EXHIBIT A

241 Dubois Street –

S: 7 T: 3S R: 72W Subd: BLACK HAWK Block: 015 Lot: 003 THRU:- Lot: 006 (LT 6 DESC IN BOUNDARY AGREEMENT #147075 & LOT 3 #149919) & IMPS
SUBJECT: Certificate of Appropriateness for full exterior rehabilitation and site improvements at 241 DuBois Street.

RECOMMENDATION: The Historic Preservation Commission recommends the following motion to the Mayor and Board of Aldermen:


SUMMARY AND BACKGROUND OF SUBJECT MATTER:
The applicants, Derek and Dawn Blake, are requesting a Certificate of Appropriateness (CofA) for the rehabilitation of the historic house, outbuildings, and site at 241 DuBois Street. The site contains an historic house and four outbuildings.

The following site and building features will be covered by this proposed rehabilitation:

**Site**
1. Existing Site Conditions
2. Exterior Street Stairs
3. Concrete Walkways
4. Stone Retaining Walls
5. Fencing

**Historic Residence and Outbuilding**
1. Roof / Gutters and Downspouts
2. Siding and Trim
3. Permeation Grouting (Stone Foundation) / Concrete Foundation
4. Doors
5. Windows
6. Porch
7. Paint
8. Additions
9. Historic Accessory Structures (Removal of Non-Historic Siding and Roof)
10. Lighting
After a discussion of the historic development of the building, the relevant portions of the Black Hawk Municipal code were reviewed, followed by an explanation of the existing conditions, proposed alterations, and evaluation of the proposal according to the relevant Residential Design Guidelines and the Secretary of the Interior’s Standards and Guidelines for Rehabilitation. In addition, reports affecting the siding and trim were reviewed and included a Wood Siding Field Investigation by PEH Architects and Wood Survey Report from Wood Identification and Consultation Services. The Historic Preservation Commission based their recommendation to City Council on a comprehensive discussion of the above material.

AGENDA DATE: March 8, 2017

WORKSHOP DATE: N/A

FUNDING SOURCE: Preservation Easement/Rehabilitation Grant

DEPARTMENT DIRECTOR APPROVAL: [ X ]Yes [ ]No

STAFF PERSON RESPONSIBLE: Cynthia L. Linker, CP&D Administrator

DOCUMENTS ATTACHED: Resolution No. 18-2017, Public Hearing Notice, Staff Report, Attachments A-I

RECORD: [ ]Yes [ X ]No

CITY ATTORNEY REVIEW: [ X ]Yes [ ]N/A

SUBMITTED BY: REVIEWED BY:

__________________________ __________________________________
Cynthia L. Linker Jack D. Lewis, City Manager
Staff Report
BACKGROUND:
The applicants, Dawn and Derek Blake, are requesting a Certificate of Appropriateness (CofA) for the rehabilitation of the historic house, two historic outbuildings, and site at 241 DuBois Street.

The estimated date of construction for the house at 241 DuBois Street is ca. 1875, although a portion of the house may date from ca. 1865 to 1872 (see “History” section that follows). The property was first evaluated for its historic and architectural significance in 1986 when the National Park Service conducted a survey of historic resources in the communities of Black Hawk, Central City, and Nevada Ville. In 1991, when Black Hawk was added to an expanded National Historic Landmark district, 241 DuBois Street was counted as a “contributing*” building to the historic district, meaning it had retained sufficient integrity to contribute to the historic character of the district. The building is a “Folk Victorian: gable*-front-and-wing’ residence that has a two-story side gable wing and a two-story front gable wing joining to form an L-shaped building. Victorian-era detailing includes fretwork* on the porch frieze*, a bay window*, and siding that is scored to resemble stones. There are two front entry doors and one-story porch is set within the ell*. A one-story addition is on the east side. An outbuilding located immediately on the west side of the house has historic stone walls on three sides; this outbuilding is included in the proposed application. Another non-historic outbuilding further west, a non-historic carport attached to the front retaining wall, and an outhouse to the rear, are not included in the application.

The intent of the CofA application as regulated by Section 16-368 of the City of Black Hawk Municipal Code is to ensure that all development and redevelopment is reviewed prior to construction, reconstruction, alterations or demolition. A CofA application requires Staff to review a proposed development for compliance with design and zoning standards as well as the Community Restoration and Preservation Program, and deem it acceptable for review by the Historic Preservation Commission (HPC). The regulations for a CofA have been reviewed by Staff and comments are included below. Attached to this staff report are the CofA supporting application documents. Excerpts from the supporting documents are included in the report. The HPC shall review the development and provide a recommendation to City Council.

[Asterisked glossary terms are defined in Attachment I – Glossary at the end of the document.]
The following site and building features will be covered by this proposed rehabilitation:

**Site**
1. Existing Site Conditions
2. Exterior Street Stairs
3. Concrete Walkways
4. Stone Retaining Walls
5. Fencing

**Historic Residence and Outbuilding**
6. Roof / Gutters and Downspouts
7. Siding and Trim
8. Permeation Grouting* (Stone Foundation) / Concrete Foundation
9. Doors
10. Windows
11. Porch
12. Paint
13. Additions
14. Historic Accessory Structures (Removal of Non-Historic Siding and Roof)
15. Lighting

After a discussion of the historic development of the building, the relevant portions of the Black Hawk code will be reviewed, followed by an explanation of the existing conditions, proposed alterations, and evaluation of the proposal according to the relevant Black Hawk Municipal Code, City of Black Hawk Residential Design Guidelines and the Secretary of the Interior’s Standards and Guidelines for Rehabilitation.

**Historic Development of the Property**
In the photograph on the following page, a one-and-a-half story, side-gable dwelling is seen on the property. This indicates that development occurred in the late 1860s to early 1870s. In the next photo (dating from 1878 – 1885), the form of the current house is evident. It is now an L-shaped house with a two-story front gable wing, and the earlier one-and-a-half story side-gable wing. There is a one-story porch set with the ell formed by the two gables, which exists today. Note that on the first story of the front-facing gable, there are two tall, narrow windows, and the side-gable wing does not have a bay window on the ground level.

By the turn of the century, a full second story had been added to the side gable wing, as well as a bay window on the ground level. Furthermore, a single large window replaced the two narrow windows on the first floor of the front gable. A decorative fret-work frieze is faintly visible in the 1910 photograph, and the one-story addition on the rear has a shed roof*.
There is also a one–story, shed-roof addition on the east side of the house that is over 50 years of age, but its exact construction date is unknown. In 1996, this addition was reconstructed in a different location, moving the wing forward by a few feet, and changing the roof form from shed to saltbox* gable. Also, a second story was added to the rear addition (see Attachment H for timeline and graphic illustration of additions).

Left:  between 1865 & 1872, Denver Public Library DPL: X-2039
Right:  between 1878 & 1887, Denver Public Library DPL: X-2072
Note: In the right photo, the side-gable wing is only one-and-half stories tall, and there are two windows on the ground floor of the front-gable.

*Left:* between 1900 and 1920, Denver Public Library L-573
*Right:* 1910, from The Gilpin Railroad Era.

Note: In both photos, a full second story has been added to the side-gable wing, and a bay window added to the first floor. Additionally, the two tall, narrow windows on the first floor of the front-gable wing have been changed to a single large window. In the left photo, a one-story shed roof addition is barely visible at the rear.
REVIEW CRITERIA

Applicable City of Black Hawk Regulations:
Certificate of Appropriateness:

Excerpts from:

City of Black Hawk
Zoning Code
Chapter 16-368, City Council historic review process

Sec. 16-368. City Council historic review process. Any person seeking to renovate the exterior of, add to or construct a new building shall be subject to the following procedures. Any such renovation, construction or demolition shall be subject to the City’s design standards.

16-368(3)(a). No building permit or site development plan shall be issued unless accompanied by a Certificate of Appropriateness (CofA) issued by the City Council for any of the following acts:

1. Construction of a new building, structure or improvement
2. Alteration or reconstruction of, or addition to, the exterior of any improvement;
3. Demolition of any improvement;
4. Construction or erection of or addition to any improvement upon any land located within the City;
5. Excavation requiring an excavation permit.

16-368(3)(f): Criteria for determining appropriateness of erection, construction, reconstruction, alteration. In determining the appropriateness of work (other than demolition) as proposed in an application for a site development plan or a building permit, the Board of Aldermen shall consider the following:

1. All plans, drawings and photographs as may be submitted by the applicant.
   The applicant has submitted all required plans and building elevations* (see following pages and Attachments B & C).

2. Information presented at a public hearing held concerning the proposed work.
   Findings and recommendations from Historic Preservation Commission will be presented to the Board of Aldermen at the Public Hearing scheduled for March 8, 2017.

3. The purpose of this Chapter.
   Staff finds the proposed development to be in conformance with the City of Black Hawk zoning and design standards.

4. Compliance with the ordinances of the City and the payment of all fees required by the ordinances of the City.
   The applicant has and will continue to pay all necessary fees required by the City.
5. The historical and architectural style, the general design, arrangement, texture, materials and color of the development, building or structure in question or its appurtenance fixtures; the relationship of such features to similar features of the other buildings within the City and the position of the building, structure, park or open space in relation to public right-of-way and to other buildings and structures in the City.

The existing historic residence is a “Folk Victorian: gable-front-and-wing.” The key character-defining features are the house’s form: a two-story side gable wing and a two-story front gable wing that join to form an L-shaped building. Other important features include the Victorian-era detailing, such as the decorative fret-work frieze on the front porch, and a bay window on the east elevation. Finally, the house’s wood siding is particularly noteworthy. The wide flush siding has been scored both horizontally and vertically to resemble masonry* blocks. The corner boards* were also designed to resemble the quoins* typically found on the corner of stone buildings. There are two historic front entry doors that retain their original design elements, and one-story porch is set within the ell. Not much historic information is known about the historic outbuilding, but it is possible that its stone walls are remnants from the historic dwelling that was formerly on the site. Both buildings contribute to the National Historic Landmark District.

6. The effects of the proposed work upon the protection, enhancement, perpetuation and use of the City which cause it to possess a special character or special historical or aesthetic interest or value.

The historic house is a contributing building to the National Historic Landmark District. The HPC should review the proposed alterations and evaluate their effect on the historic property’s potential eligibility.

7. The design standards for the City.

The proposed structure has been reviewed against the City of Black Hawk Residential Design Guidelines for historic buildings. Sections 2, 3, 4, 5, 6 and 7 of the City of Black Hawk Residential Design Guidelines are the applicable sections; see below for description of proposed work, excerpts of the applicable sections, and evaluation of the proposed alterations.
Historic Rear (North) Elevation

Photos Unavailable

Existing Rear (North) Elevation

Proposed Rear (North) Elevation
EXISTING SITE CONDITIONS
APPLICATION FOR EXTERIOR REHABILITATION

SITE:

1. Existing Site Conditions
The .32-acre lot is located on the north side of DuBois Street in the Historic Residential (HR) zone of Black Hawk. The lot is situated approximately ten feet above the grade of DuBois Street, and rises an additional 30’ in topography to the rear of the lot. There is a high stone retaining wall along the front property line, and low dry stack* stone retaining walls scattered throughout the property. A set of wood and synthetic stairs leads from the street to the property. A rock outcropping is on the west side of the property. There are four outbuildings located on the property (see below). There are concrete walkways along the east and north side of the house, and the east side of the one-story addition (see below, and the Survey sheet in Attachment B).
Left: west side of property, showing rock outcropping and low historic retaining walls
Right: looking west at front of house, showing planting bed, existing concrete walkway and picket fence

Left: stone retaining wall along front boundary, picket fence
Right: stairs leading from DuBois Street to the property
Left: stone retaining wall behind the northwest corner of the house; mortared* section is non-historic; dry-stack section – date unknown.
Right: Historic dry-stack, coursed* rubble*, field stone* retaining wall behind outbuilding. Also, dry-stack retaining wall in upper right of photo, likely non-historic.

Relevant Site Guidelines and Evaluation (City of Black Hawk Residential Design Guidelines)

2.1: Site Design

2.2.1. Respect historic settlement patterns and traditional patterns of building alignment and orientation.

The proposed rehabilitation will maintain the historic building and outbuilding in their original locations.

2.2: Topography and Grade

2.2.1. Existing topography should be maintained whenever possible.

The topography will be maintained throughout the site, with the exception of slight grading around the house.

b. Where natural rocks remains in stable condition, leave it undisturbed.

The natural rock outcroppings on the west and behind the house will be undisturbed.

2.2.5. All land that is visible from a public way shall be reclaimed in a manner described below. Preferred reclamation methods are: Plantings, as provided in the landscape standards; Natural rock, in a stable condition; Concrete retaining walls faced with native stone or appropriate wood cribbing.

The land that is disturbed by construction will be seeded in native grass, with the exception of the strip in front of the gable-front wing (see other site features).
2.2.6. Retain existing natural drainage patterns where possible; design new drainage systems to complement and follow the existing terrain.

a. Design drainage systems and storm water detention basins as amenities.

The drainage system at the north side of the house will be handled by a new concrete swale*. While this system is functional, it is not perceived as an amenity per the Guidelines.

Section Notes:
EXTERIOR STREET STAIRS
2. **Exterior Street Stairs:**

The applicant proposes to replace the existing, non-historic stairs with weathering steel construction stairs having heavy timber treads and a weathering steel pipe handrail (see below, and sheet A100 in Attachment B).

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**Proposed Street Stairs**

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**Existing Street Stairs**
Relevant Exterior Street Stairs Guidelines and Evaluation
Street stairs are not covered by the City of Black Hawk Residential Design Guidelines. In this instances, the “Secretary of the Interior’s Standards and Guidelines for Rehabilitation” were used to evaluate the proposal.

Recommended: Replacing in kind and entire feature of the site that is too deteriorated to repair if the overall form and detailing are still evident.

Not recommended: Removing a feature of the site that is unrepairable and not replacing it; or replacing it with a new feature that does not convey the same visual appearance.

Adding conjectural features to the site, such as period reproduction lamps, fences, fountains, or vegetation that is historically inappropriate, thus creating a false sense of historic development. *The application proposes to replace the existing non-historic stairs with contextually appropriate weathering steel and timber stairs.*

Section Notes:
CONCRETE WALKWAYS
3. **Concrete Walkways:**
The applicant proposes to remove the existing concrete walkways that are currently in contact with the building, and replace with wider concrete sidewalks. The concrete walkways at the rear of the house will provide drainage away from the foundation. Also, the application proposes a new concrete sidewalk along the retaining wall in front of the gable-front wing (below & sheet C200 in Attachment B).
Relevant Concrete Sidewalk Guidelines and Evaluation
Sidewalks are not covered by the City of Black Hawk Residential Design Guidelines. In these instances, the “Secretary of the Interior’s Standards and Guidelines for Rehabilitation” were used to evaluate the proposal.

Recommended: Replacing in kind and entire feature of the site that is too deteriorated to repair if the overall form and detailing are still evident.

Not recommended: Removing a feature of the site that is unrepairable and not replacing it; or replacing it with a new feature that does not convey the same visual appearance.

Adding conjectural features to the site, such as period reproduction lamps, fences, fountains, or vegetation that is historically inappropriate, thus creating a false sense of historic development.

The application proposes to replace the existing non-historic concrete sidewalks. The existing sidewalks are not historic, and their removal and replacement does not damage any historic features.

Section Notes:
4. **Stone Retaining Walls:**

The application proposes new mortared stone retaining walls to be constructed on the east and west sides of the outbuilding, and to demolish and rebuild the historic retaining wall above the outbuilding. A new concrete retaining wall will be constructed behind the house (below and Sheet C200 in Attachment B). Also, drainage outfalls* or access for utilities may be required in a few locations in the existing non-historic retaining wall along the front property line.
2.4: Retaining walls

2.4.1. Historic stone walls and other site features should be repaired or restored, replacing only those portions that are deteriorated beyond repair. The application proposes to rebuild, rather than replace, the stone retaining wall located above the outbuilding. An evaluation that this wall was “deteriorated beyond repair” was determined after a field evaluation by the Architect, Civil Engineer, and Structural Engineer. The remaining stone retaining walls will be left in place and not disturbed.

2.4.2. Native stone retaining walls are encouraged. A. Stone walls should be similar in appearance to those seen historically, including finishing, joining and heights. The application proposes to construct four new retaining walls on the west side of the outbuilding, and between the outbuilding and the house to prevent further site erosions. These new walls are proposed to be grouted native stone. While the rock walls will be grouted, they will be required to appear dry stacked in order to match the remaining historic walls on the property.

2.4.3. Retaining walls should be of dry stone or stone masonry and be compatible with other features onsite. a. Where any rock retaining walls are removed, an equal amount of rock wall shall be constructed as a part of the project. b. All rock retaining walls shall have a dry stack appearance; false materials are inappropriate. d. Unfazed concrete, Jersey Barriers, artificial brick or stone, smooth block or concrete, slump block, stucco and rustic brick are not appropriate for use as retaining walls. Similar to the guideline above, the four new retaining walls are proposed to be grouted native stone. While the rock walls will be grouted, they will be required to appear dry stacked in order to match the remaining historic walls on the property. The reconstructed retaining wall above the outbuilding will be longer than the existing historic stone wall, extending further to the west beyond the edge of the outbuilding.
The new concrete retaining wall located behind/above the house does not meet the City of Black Hawk Residential Design Guidelines for materials. However, it will not be visible from any portion of the public right-of-way due to its location and topography.

Discussion Question:

Does the plain concrete retaining wall located behind the house affect the overall historic district?

HPC: The plain concrete retaining wall located behind the house cannot be seen from the public right-of-way and does not affect the overall historic district.
FENCING
5. **Fencing:**

The application proposes to demolish the wood picket fence along the front property line, and replace it with new decorative weathering steel fencing. The fence will extend along the entire south side of the property, and will be placed on top of the stone retaining wall. The decorative metal fence will also extend a short distance on the east and west property lines. A 4’ high woven wire fence will be placed along the remaining side and rear property lines (see below and sheet A101 in Attachment B for fence location and specs.)
Relevant Fencing Guidelines and Evaluation

2.3: Fencing

2.3.1. Painted wood, wrought iron, picket, woven wire, rail or stone fences are appropriate in residential-type areas.

A new wrought iron fence will be installed along the front property line, as well as a short distance along the east and west sides. New woven wire fencing in a similar design will be installed along the side and rear property lines. The proposed fence material is appropriate according to the City of Black Hawk Residential Design Guidelines.

2.3.4. Fences shall be similar to those seen historically.

The style of the new wrought iron fence does not replicate the historic fences in Black Hawk, however, it is compatible with the City of Black Hawk Residential Design Guidelines. The proposed woven wire fence is similar to those seen historically. Although historic photographs of the property are not clear, the historic fence appears to be wood picket in several photographs.

Discussion Question:

Is the design of the proposed wrought iron fence appropriate with the City of Black Hawk Residential Design Guidelines?

STAFF: In reviewing the files for 241 Duobis, there is no mention of when the fence on the stone wall was originally installed. Photographic evidence indicates mid 1990’s. A 2004 rehabilitation grant file for the property indicated that the fence on the stone wall was replaced due to poor stability.

HPC: Residential Design Guidelines allow wrought iron fences in the residential district if black or rust colored.

Section Notes:
ROOF / GUTTERS AND DOWNSPOUTS
Historic Residence:

6. Roof / Gutters and Downspouts

Existing Roof / Gutters and Downspout Conditions
The historic two-story portion of the house has front and rear gable roofs*, with a side-facing gable roof on the east side. At the rear of the house, the gable roof was extended further to the north in 1996, forming a new second story section here (see photos below). The one-story addition on the east has a gable roof; originally, this addition had a shed roof. Finally, the northeast rear addition has a shed roof. The existing roof material is standing* metal seam. Historically, the roof material was shingles; likely wood when originally built, and more recently asphalt. Gutters have been added (date unknown).

Left: 1996; note that there is nothing above the stone room at the rear.
Right: 2016; note that the roof has been extended to the north (rear), forming a new room on the second story.
Proposed Roof Alterations
The applicant proposes to replace the existing silver standing metal seam roof with gray standing metal seam material (see below and Attachment D)

*Una-clad, metal, Charcoal Gray*

The application proposes to retain the roof shape in the front, rear, and side facing gables of the two-story sections of the house. This would retain the non-historic gable roof on the northwest corner of the second story. On the east addition (see “Additions” section on page 50), it is proposed that the non-historic gable roof be removed, and the historic shed roof be reconstructed. On the rear of the building, an additional gable-end dormer*/wing would be added, while on the east elevation of the rear second story, the non-historic shed roof would be removed, and a new dormer would be added (see following page, and pages A201, A203, A300 & A301 of Attachment B). The proposed project will also add half-round* galvanized* metal gutters and round downspouts.
3.2: Roofs

3.2.A.1. Preserve the original roof form. This includes the roof’s shape and decorative features. The front- and side-facing gables of the main portion of the house will be retained, and the original shed roof of the east addition will be reconstructed; this meets the City of Black Hawk Residential Design Guidelines. The roof of the rear northeast addition will be altered; this is discussed in the “Additions” section on page 50. When added in 1996, the northwest roof addition should not have extended the existing roof without some break or distinction from the original section of the house. It would be preferable to either return this to the original shape, or to introduce a break between the historic and non-historic sections of the house.

3.2.B.2. When repair or replacement is necessary, use materials similar to the original. The existing metal standing seam roof leaks. The proposed replacement materials are not similar to the original, and thus do not meet the City of Black Hawk Residential Design Guidelines, however, it matches the existing material.

3.2.C.3. Half round galvanized gutters are historically appropriate and preferred on residential homes. The project proposes to install half round galvanized gutters and round downspouts; this meets the City of Black Hawk Residential Design Guidelines.

Discussion Question:

Is replacing the existing standing seam metal roof acceptable with the City of Black Hawk Residential Design Guidelines?
HPC: Metal roofs are not preferred on residential structures per the Residential Design Guidelines. Since a metal roof current exists, the replacement metal roof is acceptable.

Is the dark gray color compatible with the house?
HPC: The dark gray color is compatible with the exterior historic paint colors selected.

Section Notes:
SIDING AND TRIM
7. Siding and Trim

Existing Siding Conditions
The house has horizontal tongue and groove* board siding that has been profiled to resemble masonry construction, with decorative corner boards cut to resemble quoins. Although this siding may not date to the time of original construction, it was in place by ca. 1900 when the two tall, narrow windows on the first floor of the south elevation were replaced with a single large, square window, as evidenced by the visible areas of repair on both the interior and exterior walls.

Left: tongue & groove siding with scoring  
Right: “quoins” corner boards

According to the wood investigation report prepared by Wood Identification and Consultation Services (Attachment H), the wood used in the construction of the two-story, gable-front-and-wing was milled prior to 1924. Furthermore, cut nails* were used for the structural framing in the historic gable-front-and-wing section. Wire nails*, which were typically more prevalent after 1900, were found in the siding. However, the manufacture of wire nails did begin in the late 1880s, and since historic photographs and the visible repair around the large square window show that the siding was in place at least around 1900, their presence either indicates an early use of wire nails, or a later repair.

Left: 1996 addition with matching siding  
Right: repairs from ca. 1900 after changing windows

Siding and Trim
The wood investigation report notes that the historic exterior siding on the east, south and west elevations exhibits moderate to severe weathering. There was also some evidence of moisture intrusion in the transition from the first to second floor on the east elevation.

Left: siding in good condition at porch elevation

Right: siding in poor condition on west elevation
Proposed Siding Alterations
The application proposes to remove and replace all historic siding, corner boards, and exterior window trim (covered in the “windows” section). The exterior siding for the two-story historic portion will be milled lumber to replicate the original in size and profile. Although the investigative wood report prepared by Wood Identification and Consultation Services provided a general assessment of the historic siding condition, it did not provide an in-depth notation of the areas of deterioration, or whether some (or all) of the siding was too deteriorated for repair. However, the architect has provided additional documentation to support the recommendation to replace all of the siding (see Attachment E). The siding on the reconstructed one-story addition on the east will have lap wood siding* with a 4” reveal*. The new second story additions on the rear will have lap wood siding with a 3” reveal (see Sheets A300 & A301, Attachment B).

Relevant Siding Guidelines and Evaluation (City of Black Hawk Residential Design Guidelines)

3.3: Exterior Materials: Wood Siding and Masonry
3.3.A.1. Original historic finish materials should be preserved, rehabilitated and/or repaired.

The application proposes to replace all the siding, based on the professional recommendations by Wood Identification and Consultation Services (Attachment H) and PEH Architects (Attachment E). Full replacement does not meet the City of Black Hawk Residential Design Guidelines, as well as the Secretary of the Interior’s Standards and Guidelines for Rehabilitation.

a. If portions of wood siding must be replaced, be sure to match the lap dimensions of the original.

The application proposes to replace all siding in the historic portion of the house that matches in size, profile and detailing. This meets the City of Black Hawk Residential Design Guidelines for replacement details, but only if too deteriorated for repair.

3.3.C.1. Protect and maintain significant stylistic elements.

a. Avoid removing or altering any historic material or significant features.
b. Repair historic building features that are deteriorated where feasible.
c. When disassembly of an historic element is necessary for its restoration, use methods that minimize damage to the original materials.

This application proposes to replace all historic wood siding on the house, which is a “significant stylistic feature.” The replaced siding on the historic portion of the house will match the historic siding in size, profile and detailing. Unless the siding is too deteriorated for repair, this does not meet the City of Black Hawk Residential Design Guidelines, as well as the Secretary of the Interior’s Standards and Guidelines for Rehabilitation.
Discussion Question:

Are the scored siding and corner boards character-defining features of the building?
HPC: The scored siding and corner boards is a character-defining feature of the building.

Is the replacement of all the siding supported by the City of Black Hawk Residential Design Guidelines and the Secretary Of Interior Standards?
HPC: Both the City of Black Hawk Residential Design Guidelines and the Secretary of Interior Standards state the preference is to repair rather than replace. The photos in the report do not accurately represent the condition. Actual site visits validated replacement was necessary. The new material should match the material being replaced in composition, design, texture, and other visual properties. The substitute materials will match the appearance and general properties of the historic material and will not affect the historic resource or district.

Do the professional opinions in Attachment E justify the full replacement of the siding?
HPC: The professional opinions from PEH Architects and Wood Identification and Consultation Services were reviewed. The Commission agrees with PEH Architects Option No. 3 to replace the siding in kind.

Section Notes:

Siding and Trim
PERMEATION GROUTING*
(STONE FOUNDATION / CONCRETE FOUNDATION)
8. Masonry – Permeation Grouting (Stone Foundation) – Concrete Foundation

Existing Masonry Conditions
The historic portions of the house and porch have a mortared, random ashlar field stone foundation, although the foundation beneath the bay window wing is not visible (see below and page AB200 in Attachment B). The stone foundation is in fair to good condition, with the southeast corner of the porch having the most damage.

Southwest corner of historic residence
The northwest corner of the residence formerly had a one-story masonry addition (visible in the 1996 photograph below, left). During the 1996 rehabilitation of the property, the stone walls were taken down to the bottom of the window sill*. 

*Note: The image shows the porch foundation with a focus on the northwest corner of the residence. The stone walls were taken down to the bottom of the window sill during the rehabilitation process.
Proposed Masonry Alterations
The application proposes to use permeation grouting to stabilize the historic masonry foundation, and to repair the southeast corner of the porch foundation. The repair will match the mortar color and profile, and will use a mortar formulation that will not damage the historic stone. For the foundation beneath the bay window wing (currently not visible; assumed to be stone), the application proposes to install a new concrete foundation and cover it with prefinished colored metal sheathing* to simulate a wood sill base. The east one-story addition will have a similar foundation on the south, and exposed concrete on the east and north elevation. The rear addition will also have an exposed concrete foundation (see below & sheets A300 & A301 in Attachment B; crosshatch indicates metal sheathing).
The application proposes to replicate the appearance of the original stone wall on at the northwest corner of the building by using a natural stone veneer* on the west elevation (see below and sheet A300 in Attachment B).
3.3: Exterior Materials: Wood Siding and Masonry

3.3.B.4. Repair or replacement of mortar should be done by a masonry professional experienced in historic masonry repair.

The application proposes to retain the historic stone foundation of the house and porch. In order to stabilize the historic stone foundations, “permeation grouting” is proposed. This method of stabilization occurs underground, and is therefore not visible and retains the historic stone foundation construction, and therefore meets the City of Black Hawk Residential Design Guidelines and Secretary of the Interior’s Standards for Rehabilitation.

3.3.C.2. Replace missing original features in kind where feasible
b. Where reconstruction of an element is impossible, develop a compatible new design that is a simplified interpretation of the original.

The application proposes to restore the appearance of the west wall of the rear addition with stone veneer instead of masonry construction. This is a compatible new design.

Discussion Question:

Is the metal sheathing on the concrete foundation for the east elevation (beneath the bay window), and the south elevation of the reconstructed east wing a compatible material?
HPC: Finds the metal sheathing with a factory baked finish a compatible material.

Is stone veneer, rather than stone construction, acceptable for the first story of the west elevation, rear addition?
HPC: Finds stone veneer rather than stone construction acceptable.

Section Notes:
DOORS
9. Doors:

Existing Door Conditions
The two-story portion of the house has two historic front doors set within the porch. Both retain their historic wood features, but one has replaced glazing* and the other is missing its handle hardware. Both doors are in good condition. The one-story east addition historically had two doors, but when it was reconstructed in 1996, one door was changed to a window.

Left: south-facing door, original hardware
Right: east-facing door, not operable

Left: 1996 east addition
Right: 2016 east addition
Proposed Door Alterations
The application proposes to retain the two original historic doors. The east-facing door will remain inoperable, and the historic exterior doorknob will be transferred to this door. This door will also have a new threshold constructed (currently missing), in order to give the appearance of a functioning door. The south-facing door will have the Kwikset Ashfield Adjustable Venetian Bronze Entry Door Exterior Handle hardware shown below. There will be two new doors in the reconstructed east addition, although the easternmost door will not be in the exact location of the original, and the western door will be 36” wide (which is the current size of this door). There is a new door proposed for the rear elevation. Also, there is a door proposed to replace a historic window on the west elevation (see below and Sheets A300 & A301 Attachment B). As this door is set up from the ground, a wood picket guard rail is proposed to temporarily prevent egress from the interior; future plans include a porch or stoop at this location. All new doors will be wood and as shown below: two lower wood panels, with two upper glass sashes*.

Left: new door at west elevation
Right: two doors in reconstructed east addition
Relevant Door Guidelines and Evaluation (City of Black Hawk Residential Design Guidelines)

3.4: Doors

3.4.1. Retaining and preserving original doors and door openings is preferred rather than replacement. 
*Both original doors and door openings on the historic residence will be retained on the front elevation; this meets the City of Black Hawk Residential Design Guidelines.*

3.4.2. Retain and preserve the functional, proportional and decorative features of a primary entrance.
   a. Such features can include frames, sills, heads, jambs* and moldings*.
   b. Door materials should be wood or appear similar to wood.
   *Only one door retains its original hardware; this will be moved to the non-operable door. Also, a new threshold will be constructed in order to present a functional appearance for the door.*

3.4.5. Avoid changing the position of historic doors.
   b. Also avoid adding additional doors to facades* that are visible from the street.
   *The new door proposed for the west elevation will not be visible from the street; this meets the City of Black Hawk Residential Design Guidelines. Two new doors proposed for the reconstructed one-story east addition were present historically, although the easternmost door will not be constructed in its exact original location (see Attachment B).*
3.4.6. When replacing doors, use designs similar to those found historically on comparable buildings in Black Hawk.

c. Contemporary ornate doors are discouraged on “contributing” buildings, unless photographic evidence can substantiate their historic use.

*The new door opening on the west elevation will match the historic front door width. The proposed wood door for this location will not match the two historic front entry doors, thus distinguishing “old” from “new construction.” This partially meets the City of Black Hawk Residential Design Guidelines. Door 6 in the east historic addition will be replaced with a 36” door to match the existing door. This is preferable to making the front door 36”.*

3.4.7. If heat loss or energy conservation is a concern, consider installation of a storm door instead of replacing a historic entry door.

a. wood storm door is preferred. A colored metal storm door, featuring a simple design, may be appropriate.

*Full view, metal screen doors are proposed for all door locations, which will allow the design of the historic front doors to remain visible from the public right-of-way; this meets the City of Black Hawk Residential Design Guidelines, although a wood door is preferred.*

3.5.C.6. Genuine, transparent glass shall be used in all windows and doors.

*Transparent glass is proposed for all doors, which meets the City of Black Hawk Residential Design Guidelines.*

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**Discussion Question:**

Does changing the west elevation window to a door meet the City of Black Hawk Residential Design Guidelines and the SOI Standards?

HPC: The west elevation window cannot be seen from the public right-of-way and is acceptable.

Does the new door style complement, but not imitate, the original historic doors?

HPC: The new door style is acceptable.

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**Section Notes:**

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**Doors**
WINDOWS
10. Windows:

Existing Window Conditions
According to the site investigation conducted by Wood Identification and Consultation Services, all of the windows are modern dual-pane replacements, except for the glazing on the east-facing door set within the porch. The majority of window sizes and locations appear to be the same as in the photographs dating from the National Historic Landmark district’s period of significance. Historic windows appear to have been 1/1 double-hung, except for the large square window on the front-facing gable; this window always had multiple glass sashes, except historically there were fewer panes. The windows surrounds differ throughout the historic building, possibly reflecting their different periods of construction. When the one-story east addition was reconstructed in a new location in 1996, one window on the east side of the historic building was covered.

Left: 1996, window on east elevation is barely visible; Right: East elevation window covered
East addition originally had 6/6 windows

Left: window on west elevation
Right: large window on gable-front
Proposed Window Alterations
The application proposes to replace all windows. Both replacement and new windows on the additions will be wood with aluminum cladding*. The windows will be 1/1 double-hung on the two-story historic house, as well as on the reconstructed one-story east addition. The new addition on the rear of the house will have 4/4 patterns to distinguish old from new. The Marvin window shown below is an example; the muntin* patterns will be as described and shown on sheets A300 and A301 in Attachment B. The large window on the front-gable will retain its current size, but will be replaced with one having fewer muntins, in order to match its historic appearance.

Left: Marvin window replacement Right: muntin configuration of large window on front-gable

Relevant Window Guidelines and Evaluation (City of Black Hawk Residential Design Guidelines)

3.5: Windows

3.5.A.1. Identify, retain and preserve the functional and decorative features of windows found historically.

The application proposes to change one window on the west elevation with a door; this does not strictly meet the City of Black Hawk Residential Design Guidelines, although it is not visible from the street due to topography. The door being proposed will match the existing window opening width. A historic window opening that was formerly on the east elevation of the north addition will be restored.

3.5.C.1. If replacement is necessary, replace in-kind. However, window materials that appear similar to wood may be considered on a case-by-case basis.

The replacement windows will be wood with aluminum cladding; Marvin Windows Next Generation Ultimate Clad Double Hung series. The hardware will be satin nickel finish.

a. Wood windows are preferred, however metal or clad windows may be considered if the dimension of their frame elements, and their finishes, appear similar to that of wood.

The proposed replacement windows fall within the City of Black Hawk Residential Design Guidelines.
3.5.C.2 Use windows that are similar in size, proportion and orientation to those seen historically on houses in the neighborhood.

a. Double-hung windows, with frame dimensions that are similar to those used historically, are encouraged.

The proposed replacement windows fall within the City of Black Hawk Residential Design Guidelines.

b. More flexibility is allowed on sides of the building that are less visible from the public way.

The proposed replacement windows on all sides of the house fall within the City of Black Hawk Residential Design Guidelines.

3.5.C.3. Avoid changing the position of historic windows.

A historic window opening that was formerly on the east elevation of the north addition will be restored, and all windows on the historic house will retain their original position except for the first floor west elevation; this window is proposed to be changed to a door.

3.5.C.4. Maintain the historic subdivisions of windows.

b. Where multiple-pane windows are appropriate, true divided lights* are preferred. This especially true for windows that are at ground level and close to sidewalks and walkways where the window details may be clearly seen.

c. Do not use “internal” muntins that are stuck between two layers of glass. Snap-in muntins may be used on larger areas of glass in new construction, provided they are installed on both sides of the glass.

The replacement windows for the two-story house will be 1/1, which matches their historic appearance. Although not shown currently on the drawings, the windows for the reconstructed east addition will be 6/6, based on the historic double-hung windows; this meets the City of Black Hawk Residential Design Guidelines. The large window on the gable-front will match the historic appearance of fewer lights. None of the windows will have true divided lights. Instead there will be a 5/8” simulated divided light*, with a metal grille* between the glass; aluminum grille on the exterior; and a wood grille on the interior. The replacement window simulated divided lights are not inappropriate according to the design guidelines.

3.5.C.6. Genuine, transparent glass shall be used in all windows and doors.

Transparent glass panes are proposed for all windows; this meets the City of Black Hawk Residential Design Guidelines.
Discussion Question:

Do the proposed replacement windows (wood with aluminum cladding) meet the City of Black Hawk Residential Design Guidelines?

**HPC: Proposed replacement of windows is acceptable.**

Do the externally applied grilles sufficiently replicate the historic divisions of the large square window on the gable-front wing?

**HPC: The externally applied grilles replicate the historic divisions.**
PORCH
11. Porch:

**Existing Porch Conditions**
The house has a one-story porch set within the ell formed by the cross-gables since at least ca. 1875. This porch has a hip roof*, simple square columns and pilasters* with chamfered* corners and classical bases, a fretwork frieze with span-arches, and wood decking and ceiling. The wood decking is in poor condition, and some boards on the ceiling show evidence of cupping; however, a wood report did not detail the condition of these features. The columns and fretwork are in good condition, except one base was replaced at some point; it presently does not match the other bases.

*Left: porch with decorative fretwork
*Right: engaged pilaster*
Porch decking and ceiling

Column base on southeast corner does not match the original bases
Proposed Porch Alterations
The application proposes to retain the historic columns and pilasters, as well as the fretwork frieze. Any deteriorated or missing pieces will be replaced in kind, such as the column base on the southeast corner. The porch decking and ceiling will be replaced with wood.

Relevant Porch Guidelines and Evaluation (City of Black Hawk Residential Design Guidelines)
3.6: Porches

3.6.1. Original porches should be preserved.
*The existing porch dates from the period of significance, and will be retained; this meets the City of Black Hawk Residential Design Guidelines. The columns and fretwork will be retained, although the decking and ceiling will be replaced. The decking is in poor condition.*

Section Notes:
PAINT
12. **Paint:**

**Existing Paint Conditions**
The house is currently painted blue, with cream and red trim.

**Proposed Paint Alterations**
The proposed paint scheme is shown below.
Relevant Paint Guidelines and Evaluation (City of Black Hawk Residential Design Guidelines)

4. Paint, Paint Colors and Lead Paint Issues

4.1: Color

4.1.1. Use historic color schemes.
*The proposed colors are from Sherwin Williams’ line of paint colors that were developed for historic houses. Paint colors from this line are approved for use on Black Hawk’s historic homes. The historic outhouse will be painted in the same colors as the house.*

4.1.2. Develop a color scheme for the entire building that coordinates all the façade elements. *The illustration on the previous page shows the coordinating paint scheme for the house.*

4.1.3. Use muted colors for the base and brighter colors for accents. *The main color is muted, and the accent colors are lighter or brighter.*

4.1.4. Leave natural masonry finishes unpainted when feasible. *The stone foundation will be unpainted.*

Section Notes:

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

Paint
ADDITIONS
13. Additions:

Existing Additions
The house has undergone several additions and alterations over the years; see summary in of alteration timeline in Attachment H. The house was originally a one-and-a-half story, side gable dwelling. Sometime in the 1870s, a two-story front-facing gable wing was added on the west. By ca. 1900, a full second-story was added to the one-and-a-half story wing, as was a bay window on the first floor. Also around this time, the two tall, narrow windows on the first floor of the gable-front wing were changed to a single large square window. A rear one-story addition was also constructed during the historic period of significance. A one-story addition on the east was at least fifty years of age, but was reconstructed in 1996. At this time, it was moved a few feet to the south, thus covering a historic window on the rear addition. The roof was also changed from a shed roof to a saltbox gable. A one-story stone rear addition on the northwest corner of the rear was also historic. In 1996, the west wall of this addition was removed down to the window sill level, and a second story was constructed along the entire rear of the building.

Proposed Alterations to Additions
The application proposes to retain all additions that were built prior to 1918 (the end of the period of significance for the National Historic Landmark district). It also proposes to reconstruct the one-story east addition by moving it back to its original location. The original roof will be restored, as will the window and door openings. The original siding was lap wood, and the reconstructed building will also have lap wood siding with 4” reveal. However, the concrete foundation will be higher on the east and north sides of this one-story section (see next page, and sheet A301 in Attachment B).

The 1996 second-story addition to the rear will be removed. A new second story will be added, which proposes a large dormer on the rear, and a smaller dormer on the east elevation (see next page, and sheet A301 in Attachment B). The new addition on the north elevation will have three windows and a door.

The one-story rear stone addition on the northwest corner, which was partially reconstructed in 1996, will be reconstructed with a stone veneer on the west elevation (see following pages, and sheet A300 in Attachment B). All other siding on the new additions will be lap wood with 3” reveal. This will distinguish the rear additions from the east wing, as well and the two-story historic portion.
Proposed reconstruction of east addition and historic picture

Proposed new east elevation second story addition (north side) and historic picture
Proposed new north elevation second story addition

Current picture of north elevation

Proposed reconstruction of stone addition, and new second story addition on west elevation and current picture.
Relevant Additions Guidelines and Evaluation (City of Black Hawk Residential Design Guidelines)

5. Additions to Historic Structures

5.1. Preserve older additions that have achieved historic significance in their own right.
   a. Examples may be a porch or a kitchen wing that was added to the original building early in its history.
   b. Most alterations 50 years and older have achieved historical significance.

   *This proposal retains and rehabilitates the historic additions that occurred prior to 1918 – the end of the National Historic Landmark district’s period of significance.*

5.2. More recent alterations that are not historically significant may be removed.

   *The application proposes to remove the non-historic second story rear addition. It also proposes to remove and reconstruct the one-story east addition (older than 50 years) in its original location. However, the reconstruction will not be an identical match in the following areas: the east side will have a higher concrete foundation to act as a retaining wall; and the easternmost door will be moved slightly to the west to accommodate a larger concrete foundation required by current structural loading standards.*

5.3. Design additions to historic buildings so that they do not destroy or obscure any significant historic architectural or cultural material.

   *The reconstructed one-story east addition will reveal a historic window opening; this will be restored. The new second-story rear addition will reveal the original side-gable wing roof and wall on the east elevation. The west elevation of the second-story addition will distinguish the original from the new construction with different siding and a corner board. However, it will continue the historic roofline to the rear. The one-story stone addition on the rear will not be reconstructed exactly as the original, but it will have a stone veneer to replicate the original appearance of this historic addition.*

5.4. Additions should be compatible in size and scale with the main building and surrounding neighborhood.

   a. Additions should be visually subordinate to the primary historic building. Set back and step down additions from primary facades, or set them apart from the main building and connect them with a “link”.

   *The application proposes to reconstruct the one-story east addition (older than 50 years) in its original location. However, the reconstruction will not be an identical match in the following areas: the east side will have a higher concrete foundation to act as a retaining wall; and the easternmost door will be moved slightly to the west to accommodate a larger concrete foundation required by current structural loading standards.*
Discussion Question:

Is the dormer on the east elevation of the second story rear addition sufficiently subordinate in size to the main historic house?

Is the east rear gable on the second story rear addition sufficiently subordinate in size to the main historic house?

Is the varying sizes of siding a good treatment method to distinguish old and new construction?

Is the removal of the non-historic, second story rear addition acceptable?

Is the reconstruction of the east one-story addition in its original location, and with its original roof configuration, acceptable?

**HPC: Finds the above acceptable based on Staff’s recommendations.**

Section Notes:

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Additions
HISTORIC ACCESSORY STRUCTURES
(REMOVAL OF NON-HISTORIC SIDING AND ROOF)
14. Historic Accessory Structures:

Existing Accessory Structure Conditions
There is a one-story shed roof accessory structure on the west side of the house. It is set against the historic stone retaining wall, and has two mortared stone side walls that are historic. The roof and front plywood siding, however, are not historic (see photos below, and evaluation in Attachment H);

The historic outhouse is located northwest of the house. The structure has been determined to be historic although it has been rotated from its original orientation. The roof was replaced as part of a previous grant. (see photo below, and evaluation in Attachment H).
Proposed Alterations to Accessory Structures
As the date of the roof and walls of the outbuilding were determined to be less than fifty years of age, replacement roof and wood siding would not be covered under the city’s grant program. Therefore, the applicants propose to remove the roof and front wall. The historic outhouse will only be painted to match the house.

Relevant Accessory Structures Guidelines and Evaluation (City of Black Hawk Residential Design Guidelines)
6. Historic Accessory Structures

6.1.1. The preservation of accessory structures is strongly encouraged. 

The application proposes to preserve the historic features of the accessory structure.

Section Notes:
LIGHTING
15. Exterior Lighting:

Existing Exterior Lighting Conditions
The house currently has wiring for a ceiling light and wall sconce on the porch (no fixture) and two wall sconces by the door on the one-story east addition.

Proposed Exterior Lighting
The application proposes to install dark metal wall sconces, as shown below. The locations are next to all exterior doors, including the new proposed door on the west elevation, and are shown on sheet A300 in Attachment B.

Relevant Exterior Lighting Guidelines and Evaluation (City of Black Hawk Residential Design Guidelines)
7.4. Exterior Lighting

7.4.1. Lighting fixtures should contribute to the overall historic character of a house or neighborhood.
    The proposed light fixtures are compatible with those that may have been found historically in Black Hawk.

7.4.2. Lighting should be functional not just historically decorative.
    The proposed lighting is functional.

7.4.3. All lighting should focus downward.
    The lantern-type lights are shielded from up-lighting.

Section Notes:
**STAFF & CONSULTANT COMMENTS:**
All grants must adhere to the eligibility requirements. The project was evaluated using these standards and staff found the elements of the proposal are in accordance with the ordinance submittal requirements.

The historic preservation consultant from Three Gables Preservation has evaluated the information provided for the proposed rehabilitation of the historic residence, outbuilding and site at 241 DuBois Street, and on the preceding pages have provided the evaluations on those elements that meet the City of Black Hawk Residential Design Guidelines and the Secretary of the Interior’s Standards for the Treatment of Historic Properties, and for those elements that do not meet these guidelines.

**SUMMARY:**
The Historic Preservation Commission (HPC) evaluated the application, the comments in the report, and testimony by staff, and historic preservation consultant. Due to the magnitude of the project’s scope of work, questions were provided at the end of select sections for a starting point for the HPC’s discussion. In addition to the questions at the end of the sections, the HPC could consider two general questions:

**Summary questions**
1. Do any of the proposed treatments negatively impact character-defining features of the historic building?
   **HPC:** There are no written or published guidelines for the Commission to determine level of “deteriorated architectural features”. Therefore, the Commission has based their decisions on the information provided by staff, the owner’s representative, the historic preservation consultant, the wood siding field investigation by PEH Architects and the wood survey by Wood Identification and Consultation Services. The proposed treatments do not negatively impact the character-defining features of the historic building.

2. Does the HPC believe that, after rehabilitation, this building will remain “contributing” to the historic character of the National Historic Landmark district? And if so, why?
   **HPC:** The building will remain “contributing” to the historic character of the National Historic Landmark district, because proposed substitute materials will match the appearance and general properties of the historic material.

The Commission should discussed if there was sufficient evidence that the Certificate of Appropriateness application met the intent of the criteria outlined in the City of Black Hawk *Historic Restoration and Community Preservation Fund Guide to Programs*, Section 16-368 of the *Black Hawk Municipal Code*, and Sections 2, 3, 4, 5, 6 and 7.4 of the *City of Black Hawk Residential Design Guidelines*. 
At the conclusion of its discussion, the Historic Preservation Commission may recommend to the Board of Aldermen approval, conditional approval, or denial of the Certificate of Appropriateness application for 241 DuBois Street as submitted and included in this staff report. If the HPC determines that a recommendation for conditional approval is appropriate, the discussion should focus on which elements should be included as conditions. If the HPC determines that a recommendation for denial is appropriate, the discussion should focus on which elements do not meet the intent of the program and guidelines or if the proposed work would not appropriately promote preservation of the historic character of the City.

**RECOMMENDATION:**

HPC recommends to the Board of Aldermen APPROVAL of the Certificate of Appropriateness for full exterior rehabilitation and site work at 241 DuBois Street based on the criteria set forth in the staff report dated February 21, 2017. The Certificate of Appropriateness application for 241 DuBois Street meets the intent of the criteria outlined in the City of Black Hawk Historic Restoration and Community Preservation Fund Guide to Programs, Section 16-368 of the Black Hawk Municipal Code, and Sections 2, 3, 4, 5, 6 and 7.4 of the City of Black Hawk Residential Design Guidelines.

**ATTACHMENTS:**

A. Cultural Resource Evaluation Form  
B. PEH Architects Partial Construction Document Plan Set  
C. PEH Architects Partial Construction Document Specifications  
D. PEH Architects Paint Colors  
E. PEH Architects Wood Siding Field Investigation Report  
G. Terracon – Geotechnical Report  
H. Wood Identification and Consultation Services – Structural and Architectural Materials Assessment  
I. Glossary
ATTACHMENT A

CULTURAL RESOURCE FORM
1. Current Address: 241 Dubois

2. Resource Number: 5GL.7.386

3. NHL Resource Number: B15-1

4. Resource Name: Thorvald Crook Residence

5. Purpose of this current site visit (check as many as apply)
   - Site is within a current project area
   - Resurvey
   - Update of previous site form(s)
   - Surface collection
   - Testing to determine eligibility
   - Excavation
   - Other

6. Previous Recordings:
   - 1986 National Park Service Survey
   - 1991 National Historic Landmark Nomination
   - 1998 Re-survey
   - 2004 Photo survey
   - Other: Photograph

   - X 1986 National Park Service Survey
   - X 1991 National Historic Landmark Nomination
   - X 1998 Re-survey
   - X 2004 Photo survey
   - X Photograph
   - X Photograph
   - X Photograph


8. Additional historical background: The Sanborn maps do not cover Dubois Street. This house is visible in historic photographs purportedly dating from 1878, and belonged to saloon owner and local politician, Thorvald Crook. Deed research would help determine a more accurate construction date and historical associations.

Ca. 1875 Construction date ___ Estimate from 1986 NPS Survey X New estimate

Sources of information: Digital Image Collection, Western History & Genealogy, Denver Public Library; The Gilpin Railroad Era (Abbot)

Sanborn Maps
- 1886
- 1890
- 1895
- 1900
9. Changes to Location or Size Information: n/a

10. Revised National Historic Landmark District- Contributing Building Eligibility Assessment:
    Contributing  X  Non contributing  ____  Need data.

11. National Register - Individual Eligibility Assessment:
    Eligible  ____  Not eligible  ____  Need data  X

12. Is there National Register district potential?  Yes  X  No  ____
    Discuss: This would be a contributing building to a potential N.R. district.

13. Local Designation - Individual Eligibility Assessment:
    Eligible  X  Not eligible  ____  Need data____

14. Is there Local district potential?  Yes  X  No  ____
    Discuss: This would be a contributing building to a potential local district.

15. Photograph Types and Numbers: Digital, jpg format. 241 Dubois-1.JPG, 241 Dubois-2.JPG, 241 Dubois-3.JPG


17. Recorder(s): Deon Wolfenbarger
18. Date(s): July 20, 2010

19. Recorder Affiliation: Three Gables Preservation

20. Attachments
    (check as many as apply)
    X Photographs
    ____ Site sketch map
    ____ U.S.G.S. map photocopy
    X Other ____________
    ____ Other ____________

21. Official determination
    (OAHP USE ONLY)
    ____ Determined Eligible
    ____ Determined Not Eligible
    ____ Need Data
    ____ Nominated
    ____ Listed
    ____ Contributing to N.R. District
    ____ Not Contributing to N.R. Dist
Current Address: 241 Dubois
Resource Number: 5GL.7.386
NHL Resource Number: B15-1

Current Photographs
Date: 01/21/2010
Current Address: 241 Dubois
Resource Number: 5GL.7.386
NHL Resource Number: B15-1

2004 Photographs (cont.)

1998 Resurvey Photograph
Current Address: 241 Dubois
Resource Number: 5GL.7.386
NHL Resource Number: B15-1

1986 Survey Photograph

Gilpin County Assessor’s Photographs
Gilpin County Assessor's Photographs (cont.)
Historic photographs (cont.)

Ca. 1878
ATTACHMENT C

PEH ARCHITECTS PARTIAL CONSTRUCTION DOCUMENT
SPECIFICATIONS
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Appendix E: Stone Masonry Foundation and Retaining Wall Evaluation
Appendix F: ResCheck Compliance Certificate
General Conditions and Modification to General Conditions:

These Outline Specifications are intended only to establish a scope and quality of work and are not intended to be complete detailed specifications. Where only one manufacturer is indicated, provide products of that manufacturer. “Equal” products may be submitted concurrently but shall not be submitted as a substitute without prior authorization.

It is implied and required that work which is not fully specified and/or detailed shall comply with applicable, recognized standards of the construction industry for the intended use of work, and shall be complete.

Where there is a conflict between the specifications and the drawings or within the specifications, the Contractor is to assume the higher quality, more expensive product or detail is to be used. It is the responsibility of the Contractor to ask for clarification from the Architect/Design Team.

Dimensions take precedence over scaled drawings. Large scale drawings take precedence over small scale drawings. Concrete and masonry dimensions are to face of concrete or masonry. Wood or steel stud construction is dimensioned to face of finished material unless noted otherwise. Do not scale drawings unless directed by the architect.

Before starting each portion of work, the contractor shall carefully study and compare the various drawings and other contract documents relative to that portion of work. The contractor shall field verify any existing condition related to that portion of work and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating construction by the contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the contract documents; however, any errors, inconsistencies or omissions discovered by the contractor shall be reported to the architects as an RFI.

Any discrepancies found between the drawings and specifications, and site conditions, or any inconsistencies or ambiguities in the drawings or specifications shall be immediately reported to the owner, in writing, who will promptly resolve such inconsistencies or ambiguities in writing. Work done on unreported discrepancies, inconsistencies or ambiguities by the contractor shall be done at the contractor’s risk.
1 **GENERAL CONDITIONS SUPPLEMENT**

**Summary of Work: (Project Description)**

This project consists of a two-story historic structure to be finished as indicated on the drawings. Scope is defined in these Outline Specifications and Drawings dated 2/1/17. The project is located at 241 Dubois Chase Street, Black Hawk, Colorado.

**General Alternate Requirements:**

General: The description for each alternate is recognized to be incomplete and abbreviated, but implies that each change must be complete for the scope of work affected. Refer to applicable sections and to applicable drawings for the specific requirements of the Owner, whether or not references are so noted in the description of each alternate. Modify surrounding work as required to integrate with the work of each alternate.

1. **Alternate #1: Non-historic square footage**

   All work to occur on the second floor, north of the historic second floor area shall be paid for by the owner. The historic second floor’s northern edge is the east/west wall at the north end of the second floor Bath2 and M Bed (as highlighted on the floor plans). Therefore Bedroom 3, Walk-In Closet, Reading Nook and M Bath are within the non-historic square footage. Any improvements north of the historic second floor shall be paid for by the home owner and not the historic grant program. This shall be limited to the following improvements:

   a. Wall/floor framing.
   b. Wall/floor finishes and trim (interior).
   c. Wall insulation.
   d. Light fixtures, switches and outlets. To include wiring.
   e. Exterior siding and trim.
   f. Radiant baseboard heating.
   g. Windows, doors.

   For clarification purposes, the following items shall be excluded from this alternate:

   a. Stair parts, handrails and guardrails at interior stair.
   b. Demolition of the existing framing.
   c. Demolition of the existing north patio, retaining walls or stairs.
   d. New roof framing, roof insulation, ceiling finishes or roofing.
   e. Concrete foundation and soil nails.
   f. Extension of exhaust or vent pipe through the space.
   g. Excavation and concrete retaining walls for second floor patio.
   h. Concrete patio at north.
2 SITE WORK

Site Access: Dubois Street

Demolition: Coordinate with demo plan and site plans

Grading-Excavating: Excavate as required to install foundation improvement and provide 30" depth crawl space under house. Excavate/backfill site to install underground utilities per Civil Drawings.

Bedrock removal is expected and is to be included within the contractor’s base bid. Bedrock removal shall be included for foundations, crawlspace, retaining walls, underground drain, radon piping, and domestic plumbing. Contractor to become familiar with Geotech report, and coordinate with drawings.

Drain Pipe: See Civil Drawings

Extra Dirt: Remove from site.

Top Soil: Spread evenly on disturbed areas.

Landscaping: Seed all disturbed grading with “multi-color high altitude seed mix” from Arkansas Valley Seed. Provide erosion control mat and temporary irrigation until completion of project. Soil retention blanket shall be a machine produced mat consisting of 70% agricultural straw and 30% coconut fiber. The blanket shall be covered with biodegradable netting having an approx. 5/8”x5/8” mesh on top and bottom, and be sewn together with cotton, biodegradable or photodegradable thread.

Irrigation System: N/A

Site Fence: Section 5: Ornamental guardrail and Section 5: Wire Metal Fencing

Retaining Walls: See Section 4: Masonry

Tree Removal: Remove or cut down trees as shown on the site plan. Removal shall include grinding out stump to a minimum of 12” below grade.

Sandstone Path: N/A
### CONCRETE

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strength:</td>
<td>See structural drawings.</td>
</tr>
<tr>
<td>Concrete:</td>
<td>Ready-mix.</td>
</tr>
<tr>
<td>Thickness:</td>
<td>4&quot; U.N.O.</td>
</tr>
<tr>
<td>Control joints:</td>
<td>¾” depth tooled or saw cut.</td>
</tr>
<tr>
<td>Expansion joints:</td>
<td>½” expansion filler material with plastic leveling screed peel-off caulk strip. ½” wide x ½” deep polyurethane non-sag self-leveling sealant. Provide at all junctions of slab and building, foundations, rock walls or other vertical improvements.</td>
</tr>
<tr>
<td>Reinforcing:</td>
<td>Fibermesh or as noted in the drawings.</td>
</tr>
<tr>
<td>Finish:</td>
<td>Light broom exterior, steel trowel interior.</td>
</tr>
<tr>
<td>Exposed Vertical Conc.:</td>
<td>All exposed vertical concrete at foundations and retaining wall shall have a smooth light broom and uniform finish. Provide trowel on finish.</td>
</tr>
<tr>
<td>Protective coating:</td>
<td>N/A</td>
</tr>
<tr>
<td>Conc. Stain:</td>
<td>N/A</td>
</tr>
<tr>
<td>Walkways:</td>
<td>4” concrete with deep tooled control joints at 4’x4’ spacing (or as shown on plan) over 4” compacted road base. Provide expansion joints at all junctions of slab, building and rock walls as noted above.</td>
</tr>
<tr>
<td>Driveway:</td>
<td>See Civil Drawings</td>
</tr>
<tr>
<td>Exterior Patio:</td>
<td>N/A</td>
</tr>
<tr>
<td>Drainage Swale:</td>
<td>4” thick with broom finish over 4” compacted road base. Provide expansion joints at all junctions of slab and building as noted above. Control joints at 12'-0” O.C. maximum.</td>
</tr>
<tr>
<td>Concrete Stairs:</td>
<td>6” min. thickness, ½” bull nose, broom finish</td>
</tr>
<tr>
<td>Concrete Retaining Wall:</td>
<td>See structural plans and details.</td>
</tr>
<tr>
<td>Conc. Splash block:</td>
<td>12&quot;w x 24&quot;l x 3&quot;h precast reinforced concrete splash block (Copeland Enterprises or equal).</td>
</tr>
</tbody>
</table>
Stone Retaining Wall: Existing stone wall material shall be cleaned of mortar and is to be reused where possible, see Civil general notes. New stone shall be irregular, rough, uncut native stone and should be integrated throughout the wall with the reused existing stone to maintain consistency of adjacent and existing wall. Each wall is to be constructed using similar size face of stones as the observed measurements provided in the Stone Masonry Foundation and Retaining Wall Evaluation Re: Appendix E. Coursing to be roughly horizontal and match the existing aesthetic of existing wall construction, stone color, and variation. Wall batter and location shall be constructed as specified by Civil.


Foundation Stone Veneer: Native stone, roughly 4” to 6” thick. Coursing to be roughly horizontal with irregular, rough, un-cut rubble of 50 square inches maximum (16”x3” to 7”x7”) in face diameter. Provide reinforcing ties as detailed/specified by structural. Match existing aesthetic coursing and color of “Stone Foundation”.

Stone Veneer Mortar: ASTM C270 Type O. Mortar joint to be flush with face of stone. Proportions of 1: 2: 9 (Portland: Lime: sand)
Stone Foundation: Existing stone foundation to remain. Mortar removal and replacement should be done in a checker board fashion leaving 2 foot sections of wall as originally mortared and removing and repointing mortar in alternate 2 foot sections. Alternate interior and exterior face work, so as to not work on both faces at the same time. After a week of cure, at above freezing temperatures, the remaining sections can be raked out and repointed.

Remove loose mortar as deeply as possible with a minimum depth of two to three inches. Clean and moisten the joint prior to repointing. Masonry should be damp with no standing water (saturated, surface dry). Ensure all repointing is well filled and compacted.

Exterior Stone Mortar: ASTM Type O with a starting proportion of 1:2:9 (Portland: hydrated lime: aggregate) by volume. Site mixed mortar (no pre-mix bags). It may be necessary to use white Portland cement to achieve an acceptable color match with the existing mortar. Architect/Owner to approve color match, on mortar cured for min. seven days, prior to work.

Brick Chimney: N/A

Brick Chimney Mortar: N/A
Steel Items: Primed 1 coat.

Foundation Bolts: ½” x 10”. ASTM A307 or A36, see structural drawings.

Post Stirrups: 1/8” steel. See Structural Drawings.

Beam/Post Straps: 1/8” steel. See Structural Drawings.

Connectors: 1/8” steel strapping or Simpson connectors. See Structural Drawings.

Handrail @ site stairs: 1 ¼” Diameter steel pipe with welded joints. Grind joints smooth. Powder coat black. Field touch up paint w/ black polyurethane paint. Provide vertical post or bracket at 6’-0” O.C. max.

Handrail @ porch stair: Decorative 2 ¼” steel cover rail with decorative volute ends (see details on plans). Grind joints smooth. Powder coat black. Field touch up paint w/ black polyurethane paint. Provide vertical post at 6’-0” O.C. max.

Ornamental Guardrail: See drawings for details. All posts and horizontal rails to be Corten weathering steel (mild steel allowed to rust is not an acceptable substitute). Grind all welds smooth. Panel at sloping grade to be installed on a rake to follow finished grade (top and bottom rail to follow slope of finished grade; posts & pickets to be vertical).

Wire Metal Fencing: See drawings for details. All posts and horizontal rails to be mild steel allowed to naturally rust. Grind all welds smooth. Wire fencing (48” height) to be galvanized 11 ga., woven double loop, available 1st quarter of 2017 at American Iron Fence (271-773-3778) www.AmericanWireFence.com. Wire tied at each steel post and at 24” O.C. top and bottom. Panel at sloping grade to be installed on a rake to follow finished grade (top and bottom rail to follow slope of finished grade; posts to be vertical).
<table>
<thead>
<tr>
<th>Component</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studs:</td>
<td>Hem Fir, #2 or better, U.N.O.  See Structural Plans.</td>
</tr>
<tr>
<td>Framing Lumber:</td>
<td>Hem Fir, #2 or better, U.N.O.  See Structural Plans.</td>
</tr>
<tr>
<td>Roof Trusses:</td>
<td>N/A</td>
</tr>
<tr>
<td>Beams:</td>
<td>See Structural Plans.</td>
</tr>
<tr>
<td>Backing for Accessories:</td>
<td>2x6 U.N.O., backing shall be provided at 36” above tub/shower floor.</td>
</tr>
<tr>
<td></td>
<td>Wall mount TV locations?</td>
</tr>
<tr>
<td>Wall Sheathing:</td>
<td>½” CDX plywood or 7/16” OSB - APA rated 24/16 exp 1, blocked and nailed U.N.O.,</td>
</tr>
<tr>
<td></td>
<td>Re: Structural.</td>
</tr>
<tr>
<td>Roof Sheathing:</td>
<td>½” CDX plywood or 15/32” OSB, APA 32/16, nailed, Re: Structural. Provide</td>
</tr>
<tr>
<td></td>
<td>additional layer(s) of plywood sheathing where aligning to existing plank</td>
</tr>
<tr>
<td></td>
<td>sheathing.</td>
</tr>
<tr>
<td>Subfloor:</td>
<td>¾” T&amp;G “Sturd-I-Floor”, glue and screw install per structural.</td>
</tr>
<tr>
<td>Soffit:</td>
<td>3/8” x 4” tongue and groove V-groove beadboard, smooth pine, painted. To be</td>
</tr>
<tr>
<td></td>
<td>installed parallel to the wall face. Miter joint and align rake/eave junctions.</td>
</tr>
<tr>
<td>Fascia:</td>
<td>6” fascia = 7/8” x 6” actual, rough western red cedar, clear vertical grain,</td>
</tr>
<tr>
<td></td>
<td>plowed for soffit. Running trim to have bevel joint oriented to shed water.</td>
</tr>
<tr>
<td></td>
<td>Pre-prime all 6 sides and field cuts prior to install.</td>
</tr>
<tr>
<td>Interior Trim:</td>
<td>All trim to be a poplar or solid wood (no finger joint material) paint grade.</td>
</tr>
<tr>
<td></td>
<td>See drawings for profiles.</td>
</tr>
<tr>
<td>Base:</td>
<td>See “interior trim”</td>
</tr>
<tr>
<td>Casing:</td>
<td>See “interior trim”</td>
</tr>
<tr>
<td>Material:</td>
<td>See “interior trim”</td>
</tr>
<tr>
<td>Window:</td>
<td>See “interior trim”</td>
</tr>
<tr>
<td>Door:</td>
<td>See “interior trim”</td>
</tr>
</tbody>
</table>
Exterior Trim @ Horz Lap: 7/8” Rough western red cedar, clear vertical grain. 7/8” thickness is based on ripping 8/4” rough sawn into 2 boards. Running trim to have bevel joint oriented to shed water. Siding is not to project past the edge of the trim. Trim available at Wood Source (303-297-8310) or equal. Pre-prime all 6 sides and field cuts prior to install.

Corner: 4” trim = 7/8” x 4” actual. Rip one board per corner to maintain a 4” exposure on each wall face.

Window: 4” trim = 7/8” x 4” actual for jamb. Include ripped 2”x4” rough sawn sill extension w/ sloped top and drip edge kirf cut. 7/8”x4” actual for head. See Elevation Drawings.

Door: 4” trim = 7/4” x 4” actual rough sawn for head and jamb. Thicker trim at door is needed for storm doors.

Mounting Blocks: Provide one solid board at all wall mounted equipment (butt joint boards not acceptable). Board sizes to be coordinated with equipment to allow full flush mount. Provide flashing at top of board. Paint board to match siding. Do not interrupt trim or casing to install mounting blocks. Sizes as follows:

- Light fixture: 8”x8”x7/8”
- Elec. Outlets: 8”x8”x7/8”
- Hose bib: 8”x8”x7/8”
- Exhaust wall cap: Coordinate with wall cap size (min. 1” larger on each 4 sides).
- Elec. Meter/disconnect: Coordinate with equipment size (min. 1” larger on each 4 sides).
- Pipe penetrations: No mounting blocking, cut siding tight around pipe penetrations.

Exterior Trim @ Faux Msnry: 7/8" Rough western red cedar, clear vertical grain. 7/8" thickness is based on ripping 8/4" rough sawn into 2 boards. Running trim to have bevel joint oriented to shed water. Siding is not to project past the edge of the trim. Trim available at Wood Source (303-297-8310) or equal. Pre-prime all 6 sides and field cuts prior to install.

Corner: 12” quoining trim = 7/8” x 12” actual. Rip one board per corner so as to maintain an equal exposure on each wall face. See plans for dimensions. Installed over the siding.

Window: 4” trim = 7/4” x 4” actual for jamb. Include ripped 2”x4” rough sawn sill extension w/ sloped top and drip edge kirf cut. 7/4”x4” actual for head/skirt, include ripped ½” actual thickness for cap overhead trim and stark lumber WM-54 crown molding for head. See Elevation Drawings.

Door: 1” trim = 7/8” x 7/8” actual, rounded pencil trim, rough sawn for head and jamb. See Elevation Drawings.

Mounting Blocks: Provide one solid board at all wall mounted equipment (butt joint boards not acceptable). Board sizes to be coordinated with equipment to allow full flush mount. Provide flashing at top of board. Paint board to match siding. Do not interrupt trim or casing to install mounting blocks. Sizes as follows:

- Light fixture: 8”x8”x7/8”
- Elec. Outlets: 8”x8”x7/8”
- Hose bib: 8”x8”x7/8”
- Exhaust wall cap: Coordinate with wall cap size (min. 1” larger on each 4 sides).
- Elec. Meter/disconnect: Coordinate with equipment size (min. 1” larger on each 4 sides).
- Pipe penetrations: No mounting blocking, cut siding tight around pipe penetrations.

Exterior ShipLap Siding: Smooth cedar, clear vertical grain, custom ship lap siding (See Elevation Drawings), 6” reveal. Pre-prime all 6 sides and field cuts prior to install. Fasteners to be located per WWPA recommendations (exposed and flush with siding surface).
Deck:

Decking: Stained 5/4x6 “custom clear” cedar S4S with eased edge. Picture frame deck edges (no exposed end grain).

Fasteners: Concealed. Tiger claw TC-1 or equal.

Top Rail: N/A.

Guardrail: N/A.

Sawn Baluster: N/A.

Posts: Restore existing posts per “porch” below.

Porch:

Carefully scrape paint from porch “ginger bread” and posts (see “Existing Wood Restoration” below). Repair damaged components with epoxy fillers. Replace rotten components. Recreate missing bracket, base trim and dental details using new solid wood (western yellow pine). Replacement components shall be doweled or biscuited to original wood, glue, epoxy, and sand smooth. Sand epoxy fillers to shape, prime and paint.

Existing Wood Restoration:

Prior to priming: Thoroughly hose off any debris, dirt, or sand particles with a garden hose (DO NOT waterblast). Remove damaged or deteriorated paint to the next sound layer by handscraping with a putty knife/paint scraper and handsanding with a block sander. DO NOT scrape paint that appears to be fully adhered to wood. If a moisture problem is evident, remove all sources of moisture in order for new paint to fully adhere. In areas of detail (“gingerbread”, brackets, etc.), an electric heat gun may be used to loosen paint and then scraped/sanded. As a last resort, a solvent-based chemical stripper may be used to loosen heavy build-up. It is imperative that the manufacturer’s instructions are followed thoroughly for this step. Once the paint has been loosened, scrape/sand the areas. DO NOT hose off solvent based paint sludge. Once the wood has dried thoroughly, it can be primed, caulked and painted. (A more detailed description of Preservation of Exterior Woodwork can be found at: http://www.nps.gov/tps/how-to-preserve/briefs/10-paint-problems.htm)
Exterior Stairs:

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stringer</td>
<td>2x12 P.T. and 1x12 finish stringers cedar (C, +better) painted.</td>
</tr>
<tr>
<td>Treads</td>
<td>5/4x6 clear cedar S4S with eased edge, stained.</td>
</tr>
<tr>
<td>Riser</td>
<td>Ripped 1x8 cedar (C+better) smooth, painted.</td>
</tr>
<tr>
<td>Handrail</td>
<td>See Section 5: Metals</td>
</tr>
<tr>
<td>Top Rail</td>
<td>N/A</td>
</tr>
<tr>
<td>Balusters</td>
<td>N/A</td>
</tr>
<tr>
<td>Sawn Balusters</td>
<td>N/A.</td>
</tr>
<tr>
<td>Newel Post</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Roofing:</strong></td>
<td>All metal roofing and underlayment to be per UNA-CLAD manufacturer. Follow all manufacturer installation recommendations.</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Underlayment:</strong></td>
<td>Full coverage of one layer of CLADGARD MA, CLADGARD SAFR (for class A fire rating) and 2 full layers at roof slope less than 3:12.</td>
</tr>
<tr>
<td><strong>Snow Guard:</strong></td>
<td>S5 clip attached to standing seam (12” o.c.) w/ “Color Guard” horizontal cross member snow guard to match roofing finish.</td>
</tr>
<tr>
<td><strong>Warranty:</strong></td>
<td>30 year finish warranty</td>
</tr>
<tr>
<td><strong>Ice + Water Shield:</strong></td>
<td>See “Underlayment” above.</td>
</tr>
<tr>
<td><strong>Roof Accessories:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Drip Edge:</strong></td>
<td>24 gauge galvanized, pre-finished.</td>
</tr>
<tr>
<td><strong>Roof Vent:</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Soffit Vent:</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Gutters:</strong></td>
<td>Galvanized 24 gage steel. Not painted. Hidden clips with roof bracket/strap (under roofing) @ 18” O.C.</td>
</tr>
<tr>
<td><strong>Size/Shape:</strong></td>
<td>6” Half Round, with reverse bead (coordinate w/ clips).</td>
</tr>
<tr>
<td><strong>Downspouts:</strong></td>
<td>Galvanized 24 gage steel. Not painted. Clips @ 48” O.C. max.</td>
</tr>
<tr>
<td><strong>Size/Shape:</strong></td>
<td>4” circular.</td>
</tr>
</tbody>
</table>
Drainage Plane at Concrete Retaining Wall: Cosella Dorken, “DELTA-Drain 6000” drainage plane. 0.39” (10mm) depth polypropylene sheets. They are formed with dimples and a spunbond polypropylene fabric on one side. (Fabric to be on “dirt” side). Wrap fabric edge over top of plastic dimple sheet near top of grade. Hold drainage plain 2” below finished grade. Provide manufacturer connection between drainage plain and perforated foundation drain.

Masonry Weep: N/A

Insulation:

Wall: R-24 depth, 2lb. closed cell spray foam by Bayseal (R-6.9/Inch).

Under Roof: R-49 depth, 2lb. closed cell spray foam by Bayseal (R-6.9/Inch). Provide intumescent paint in exposed attic areas as required by local code and per manufacturer’s instructions. (Contractor’s option to use closed cell spray foam with class 1 fire rating).

Flat Ceiling: N/A

S.O.G. Conc. Floor: 2 layers of 1” rigid insulation (R-10 total) stagger joints each way. Owans Corning “Foamular 250” (25psi) or equal.

Foundation @ S.O.G.: 1 layer of 2” rigid insulation (R-10 total) adhered to concrete foundation prior to backfill. Owens Corning “Foamular 250” (25 psi) or equal.

Foundation @ crawl: R-15 depth, 2lb. closed cell spray foam by Bayseal (R-6.9/Inch). Provide intumescent paint in exposed crawl space areas as required by local code and per manufacturer’s instructions. Provide 2’ of R-15 spray foam on crawl space floor over vapor barrier, see drawings. (Contractor’s option to use closed cell spray foam with class 1 fire rating).

Foam Insulation: All electrical outlets and wire holes in plates/joists, windows and exterior doors (low expanding foam @ doors and windows).

Pipe Insulation: See Mechanical Plans.

Vapor Barrier: Class A - 15 mil, Stego Industries or equal. 12” overlap of sheet, 6” up foundation walls. Tape all seams with manufacturer’s tape. Seal all penetrations with manufacturer’s tape. Tape to be 3.75” minimum width. Follow manufacturer’s installation instructions.
Building Paper or WRB (Weather Resistive Barrier): Tyvek “Drain Wrap” vapor permeable infiltration barrier with vertical drainage channels. Minimum 6” vertical overlap. Manufacturer approved tape at all seams, flashing head AND PENETRATIONS.

Skylights: N/A

Asphaltic Waterproofing: Bituminous Damproofing
Provide 2 coats of an asphalt emulsion conforming to ASTM DI 187 to exterior vertical concrete surfaces of the foundation. Do not extend above grade. Do not apply to stone foundation or stone veneer.
New Windows:

Brand: Marvin
Type: Next Generation Ultimate Clad Double Hung
Interior: Pine, factory applied prime. G.C. to paint per “Section 9c Interior Trim”
Jamb Extensions: Exclude factory jamb extensions. G.C. to provide poplar 1x extensions installed in the field – custom depth to match wall thickness. (See details in plans)
Exterior: Factory applied AAMA 2605-05 finish. Color to be “Stone White.”
Glass: LOE-272, Double Pane clear U.N.O. U-Value 0.33 (provide decorative glass as noted in window schedule).
Tempered Glass: See Window Schedule on plans.
Egress: See Window Schedule on plans.
Screens: Aluminum full screen frame to match window finish. Charcoal fiberglass screen mesh.
Divided Lights: 5/8” SDLS simulated divided lite w/ spacer bar. Square interior sticking.
Hardware: Oil rubbed bronze finish sash lock and sash lift.
Flashing: Flash per manufacturer’s instructions (See window details on plans).
Warranty: Glazing - 20 year seal failure/10 year stress crack - Non-glazing components - 10 years Exterior cladding – 20 years

Additional Window Notes: G.C. is encouraged to schedule a pre-walk with Marvin representative for flashing and building paper installation.

Site-built window(s): Double pane w/ Low-E Clear (hard coat low-E PPG 500 SunGate annealed glass on the 2nd surface) tempered glass 5/8” thick with grey super spacer. Field measure glass and install per details in drawings.
Mirrors: (also see Section 10: Specialties for med cabinet)

Plate: ¼" frameless, polished edge.

Size: Per plan (see interior elevations).

Location: M Bath

Doors:

Interior Passage Doors: Solid wood, stained – see door schedule.


Interior Door Hardware:

Swing Door Hardware: Kwikset, “Ashfield” style lever-sets, venetian bronze P11 finish (locking at bedroom and bathroom doors).

Pocket Door Hardware: Schlage recessed pocket door pull in aged bronze Johnson “2000 Series” pocket door frame, include the 2041 hidden pocket door guide kit.

Exterior Doors: Solid Wood, stain interior, paint exterior. (see door schedule).

Exterior Utility Room Door: N/A

Exterior Storm Doors: Liberty Home Products, Inc. “full view” from the traditional collection storm doors (303-698-1750) or equal. Coppervein powder-coat steel. Antique brass hardware with key to match entry doors. Clear tempered glass. Provide charcoal fiberglass insert. GC to verify and provide custom sizing.

Exterior Door Hardware: Kwikset, Smart Key Technology, “Ashfield” style lockable thumbpress handleset and deadbolt. Match key to all exterior handlesets and deadbolts. Venetian bronze P11 finish. Interior lever to be “ashfield”.

Hinges: 3 per door, finish to be oil rubbed bronze, (3 ½”x3 ½” @1 3/8” doors and 4”x4” @1 ¾” doors).
<table>
<thead>
<tr>
<th>Component</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door Frames</td>
<td>Interior and exterior door frames to be finger-joint material. Provide kerf for weather stripping at exterior doors.</td>
</tr>
<tr>
<td>Weather seals:</td>
<td>Install/provide new at all new and existing exterior doors.</td>
</tr>
<tr>
<td>Thresholds:</td>
<td>Adjustable oak top sill with anodized aluminum exterior (Pemko or equal). Exterior finish to be anodized dark bronze aluminum. Provide aluminum sill extension to ensure full coverage at door threshold.</td>
</tr>
<tr>
<td>Door Stops:</td>
<td>Schlage solid brass door stop (or equal). Finish to be aged bronze. Provide at all pivot doors. Preferred mounting locations in order of most to least preferred: baseboard, floor, wall at knob, hinge mounted.</td>
</tr>
<tr>
<td></td>
<td>Baseboard – Schlage #61-716</td>
</tr>
<tr>
<td></td>
<td>Floor – Schlage #436-716</td>
</tr>
<tr>
<td></td>
<td>Wall – Schlage #407-716</td>
</tr>
<tr>
<td></td>
<td>Hinge – Schlage #70-716</td>
</tr>
<tr>
<td>Exterior Storage Door:</td>
<td>N/A</td>
</tr>
<tr>
<td>Shed Doors:</td>
<td>N/A</td>
</tr>
<tr>
<td>Garage Doors:</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Walls:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field Tile</td>
<td>See Appendix B for selection(s) and location(s). Over ½” Dens-Shield underlayment. See architectural interior elevations for locations.</td>
</tr>
<tr>
<td>Accent Tile Band</td>
<td>See Appendix B for selection(s) and location(s). Over ½” Dens-Shield underlayment. See architectural interior elevations for locations.</td>
</tr>
<tr>
<td>Tile Edge</td>
<td>See Appendix B for selection(s) and location(s).</td>
</tr>
<tr>
<td>Grout</td>
<td>See Appendix B for selection(s) and location(s). Grout lines to be as tight as recommended by tile manufacturer. Seal Grout with Mapei grout sealer. Provide color sample for approval by owner. Provide matching sanded caulk for expansion joint treatment at dissimilar material joints and at changes in wall and ceiling planes.</td>
</tr>
<tr>
<td>Kitchen Backsplash</td>
<td>See Appendix B for selection(s). Tile full height backsplash and sidesplash. Provide matching sanded caulk at changes in wall planes and at joint with counter.</td>
</tr>
<tr>
<td>Grout</td>
<td>N/A</td>
</tr>
<tr>
<td>Bath Backsplash</td>
<td>See Appendix B for selection(s). Integral 4” backsplash made from the same material as bath counters.</td>
</tr>
<tr>
<td>Kitchen Counters</td>
<td>See Appendix B for selection(s) and location(s).</td>
</tr>
<tr>
<td>MBath Counter</td>
<td>Owner provided granite slab. Approximate remnant dimensions are 121”x36” x 3cm. GC to cut, edge and finish slab. Edge finish to be eased top and bottom edges. Slab to be used for counter and 4” height backsplash and side splash.</td>
</tr>
<tr>
<td>Bath2 Counter</td>
<td>See Appendix B for selection(s) and location(s).</td>
</tr>
<tr>
<td>Bath3 Counter</td>
<td>See Appendix B for selection(s) and location(s).</td>
</tr>
</tbody>
</table>
PAINTING/STAINING

Additional Product: Provide (1) un-used full gallon of each finish paint (interior and exterior) at end of project for home owner storage and use.

Paint Primer: Provide (1) coat of primer for all painted areas prior to applying the required listed number of finish coats of paint per each material section. Primer shall be of contrasting color to finish paint.

Exterior Wood: 3 coats satin acrylic latex over 1 coat primer. 3 color scheme. Exterior paint to be applied with either brush or roller only (spray allowed with back roll). All paint by Sherwin Williams A-100 exterior latex A82 series or equal (coordinate w/ exterior rendering in Appendix).

Body: Sherwin Williams “Downing Slate SW2819”

Accent: Sherwin Williams “Rookwood Red SW2802”

Trim, soffit and porch ceiling: Sherwin Williams “Colonial Revival Gray SW2832”

Deck & Wood Stair Stain: GC to submit 12x12 cured system sample (with all 3 coats) for approval.

SuperDeck Semi-Transparent Oil:
• 1st Coat: SW Superdeck Deck Wash
• 2nd Coat: SW Superdeck Premium Waterborne Solid Color Deck Stain, “SW 3079 Stone”
• 3rd Coat: SW Superdeck Premium Waterborne Solid Color Deck Stain, “SW 3079 Stone”

Breathable Waterproof Finish: N/A

Conc. Stain: N/A

Exterior Metal (Handrail): Metals shall be powder coated in a climate controlled shop. Field touch-up paint at welds on-site with polyurethane paint, Sherwin Williams Hi-Solids Polyurethane paint over “Macropoxy 646” Fast cure epoxy primer.
Interior Drywall/Plaster: 2 coats acrylic latex, low VOC, over 1 coat primer (spray application allowed). Sherwin Williams promar 200 zero VOC B31-2600 series or equal. Semi-gloss at kitchen, MBath, Bath2, Bath3, Laundry and Mech., all other areas to be satin. Ceilings to be flat.

Paint: See Appendix B and room finish schedule in architectural drawings for paint colors, finish, and location.

Interior Trim: 2 coats semi-gloss acrylic latex, low VOC, over 1 coat primer. Sherwin Williams promar 200 zero VOC B31-2600 series or equal. See Appendix B for color.

Interior Doors: Painted (at historic doors only): 2 coats semi-gloss acrylic latex, low VOC, over 1 coat primer. Sherwin Williams promar 200 zero VOC B31-2600 series or equal. See Appendix B for color.

Stained: See “Interior stained wood below”

Caulking: Silicone or Acrylic, all open joints, color of adjacent surface. Provide sanded caulk at tile areas.

MDF Products: Prime all MDF products with low VOC acrylic latex

Construction Adhesives: low VOC

Interior Stained Wood:

Stain: 1 coat oil based stain, Sherwin Williams Sherwood Wiping Stain (or equal), GC to color match pre-finished cabinetry, 1 coat oil based sealer Sherwin Williams Sherwood Fast Dry Vinyl Sealer. Contractor to provide samples of stain on actual wood (hickory stair parts, doug fir doors and hemlock doors) to be utilized for approval prior to staining project.

Transparent Finish: 2 coats polyurethane, “Minwax Polyurethane for Floors” or equal.
ATTACHMENT D

PEH ARCHITECTS PAINT COLORS
SHINGLES
UNA-CLAD
CHARCOAL GRAY

SIDING COLOR
SHERWIN WILLIAMS
DOWNING SLATE SW2819

ACCENT COLOR
SHERWIN WILLIAMS
ROCKWOOD RED SW2802

TRIM, SOFFIT, CEILING
SHERWIN WILLIAMS
COLONIAL REVIVAL GRAY SW2832

WINDOW TRIM
MARVIN
STONE WHITE

DECK STAIN COLOR
SHERWIN WILLIAMS SUPERDECK
CHEYENNE RED SW3043
SOLID STAIN

241 DUBOIS STREET
BLACK HAWK • COLORADO
MEMORANDUM

Date: February 14, 2017

To: Scott McClelland, NV5
    Cindy Linker, City of Black Hawk

From: Nathan Pillatzke, AIA

Re: 241 Dubois Street – Siding Rehabilitation
     PEH 2016.26

The following is a summary of the condition of the existing siding/trim and rehabilitation alternatives.

The existing siding on the oldest portions of the home is a tongue and groove western yellow pine. The siding and trim is unique to the house and is not known to be on any other homes in Black Hawk. The siding and trim were cut to create the appearance of a block masonry wall with a running bond pattern. The corner trim on the house was cut to create the appearance of block masonry quoining.

**Siding:**

Tongue and groove western yellow pine installed horizontally with six-inch exposure. Tongue dimensions are not known. Surface of siding was originally cut with shallow reveals to create the appearance of 11.5” x 5.5” blocks with 1/2” bed and head mortar joints.

Existing condition:
The siding is weathered with many layers of paint. The thickness of the paint has begun to obscure the surface detailing, to the point of losing the visibility of the faux stone appearance. Older layers of paint have cracked and delaminated, causing defined layers of broken paint chips below the newest layer of paint. The most recent paint application appears to be in fairly good condition, however peeling, alligatoring and/or cracking of the paint is evident in numerous locations on each face of the house. Re-occurring peeling paint is resurfacing on the most deteriorated weathered siding.

Weather tightness of the siding is heavily reliant on caulking. Each horizontal joint of the tongue and groove siding has been caulked. Caulking has been excessively applied with caulk applied to the face of the siding both sides of each joint. Caulking has further obscured the fine detailing between each horizontal joint. Caulking is failing throughout due to the natural expansion and contraction of the wood during season humidity changes.

Severe damage of siding has occurred to a select number of areas. Siding has buckled on the west elevation creating a clear view into the interior of the home.

**Corner board quoining:**

Corner boards are hand cut with a toothed profile along the long edge of the board to create the appearance of masonry quoining. In addition to the toothed profile the surface of the board is cut to create the appearance of individual block masonry. The corner boards are installed over the siding providing a deep reveal and shadow line.
Existing condition:
The corner boards have a great deal of damage. Many of the toothed cuts have broken completely free of the original board. The broken edges have been caulked, however water damage continues, evident by the peeling and cracked paint.

Weather tightness of the corner trim is heavily reliant on caulking. Due to the corner boards being installed over the siding, the only method to prevent water from getting behind the boards is caulking the entire perimeter. Cracking within the caulking continues due to the natural expansion and contraction of the wood during season humidity changes.

Siding Rehabilitation options:
Although the siding and trim could see a variety of rehabilitation options, the following provides a brief description of three concepts, while highlighting the concerns and benefits of each method of rehabilitation.

1. Paint and caulk the siding as is with limited replacement.
The most severely damaged siding, primarily buckled and rotten siding, would be removed. All other siding would remain, including siding with vertical joints and severe weathering. The paint would be scraped to remove delaminating paint and caulk.

   Final appearance of the siding would resemble much what is seen today. The caulking at the joints would remain and filled in where missing. The deep layers of paint could be seen, especially where paint is delaminated down to fresh wood. Each splice of the wood siding will remain visible.

   Concerns – Once insulation installed in the stud cavity behind the existing siding, the siding will lose its ability to breathe to the interior. Evidence of buckling siding and peeling paint are signs of moisture leakage. If the siding gets wet, that inability to breathe (or dry out), will trap the moisture. That moisture will begin to rot the wood and advance the delamination of the paint as seen today. Furthermore, the fact that there is no sheathing behind the siding will allow moisture access to the stud framing and interior finishes. The moisture in the wall has the potential of mold and mildew issues.

   Benefit – Maximum restoration of the existing siding.

2. Remove and reinstall the existing siding
The siding and trim would be removed and reinstall. This would allow for siding to be installed over sheathing with an air and weather barrier. Flashing would be installed at all horizontal joints to prevent the intrusion of water while also allow a path for moisture to get out of the wall. Broken and damaged siding would be replaced with like material.

   Final appearance of the siding would look much like it would today, however there would be new siding laced into the existing material. All caulking would be removed and new caulking would only be installed where needed.

   Concerns – Removal of the historic siding will be difficult. The wood will likely be brittle due to its old age and exposure to the sun. This brittleness will result in a portion of the removed siding to require replacement due to breakage and splintering. Each individual piece of wood will require cleaning and preparation work before reinstallation due to the excessive caulking. This will result in the horizontal joints between each board to have a harsh jagged character in comparison to the surface which could maintain the many layers of paint.
Benefit – Siding installation that current building codes and standards of construction in terms of weather protection, while also attempting to retain only the best pieces of siding and trim.

3. Replace the siding in kind

The siding and trim would be replaced in kind. Details would be provided for the recreation of each. The siding would be installed over new sheathing with an air and weather barrier. Flashing would be installed at all horizontal joints to prevent the intrusion of water while also allowing a path for moisture to get out of the wall.

The final appearance of the siding would match the original character of the existing siding. The fine detailing of the siding would be recreated. All broken and damaged siding would be replaced.

Concerns – The original siding would be fully replaced.

Benefit – A new siding and trim package would meet the current building code and standards of construction in terms of weather protection and the new material will likely require the least maintenance. The new material will be more dimensionally stable, rot resistant and be fully primed prior to installation, further improving the longevity of the siding, thus improving the longevity of the historic structure.
Surface detailing obscured by weathering and thick paint. Paint is cracking, assumed due to moisture infiltration and poor adhesion of paint. Vertical splice joints at horizontal siding are a likely water infiltration locations.
Failing caulk joints under covered porch, allowing moisture behind paint and into wood.

Excessive caulking. Failed joint allowing water behind wood.

Seasonal humidity changes causing caulk joints to fail.

Excessive caulking. Failed joint allowing water behind wood.
Evidence of tongue and groove.
Clear view into house.

Distressed boards due to moisture damage near grade.

Buckled siding.
Cupped skirt board.

Pediment and 50% of sill are historic. All other wood is replacement.
Failing paint, assumed from moisture behind siding.

Broken toothed corner boards

Caulking used to repair boards, continual cracking due to season humidity changes.
ATTACHMENT F

ATKINSON-NOLAND & ASSOCIATES, INC.
INVESTIGATION REPORT
Investigation Report

Stone Masonry Foundation and Retaining Wall Evaluation

241 Du Bois Street
Black Hawk, Colorado

ANA Project #16-021

Prepared for:
Ms. Cynthia L. Linker
Community Planning and Development Administrator
PO Box 68, 211 Church Street
Black Hawk, CO 80422

Prepared by:
Atkinson-Noland & Associates, Inc.
Consulting Engineers
2619 Spruce Street
Boulder, CO 80302
(303) 444-3620

September 1, 2016
1 Introduction and Background

Atkinson-Noland & Associates, Inc. (ANA) has prepared this report of findings and analysis of masonry retaining walls and foundation walls at 241 Du Bois Street in Black Hawk, Colorado. ANA performed observations at stone retaining walls at the roadside, carriage house, shed, exposed foundation of the existing house, and CMU retaining wall at the back of the home. Investigation areas are shown highlighted on the drawing file entitled “241 Dubois_90BLH15_IMPROVEMENT SURVEY_PLAT_ANA Scope,” which are shown below in Figure 1.

![Figure 1. Portion of survey drawing with highlighted areas indicating walls investigated. Notes by NV5.](image)

This report includes documentation of current conditions of stone masonry walls, results of simple structural analysis, and results of laboratory mortar testing.

David Woodham, P.E. and Andrew Geister, P.E. of ANA were on site August 15, 2016 to perform the investigation and collect mortar samples. Scott McClelland of NV5 coordinated site access and provided electronic drawings used in this report.
2 Approach and Methodology

The typical approach that ANA followed was to observe, photograph, and note conditions at each wall investigated. Wall characteristics such as height, thickness, batter, and solidity were documented. The majority of wall characteristics were determined with visual observations and physical measurements; batter was determined using a laser level, and thickness was determined using ground penetrating radar. Wall solidity was observed using a fiber optic borescope inserted into joints between stones. Observations were conducted at multiple locations and heights for each wall investigated.

A simple gravity analysis incorporating the wall characteristic data collected on site was performed to evaluate factors of safety for each wall against overturning and sliding. Factors of safety, from the American Association of State Highway and Transportation Officials (AASHTO), are 1.5 for sliding and overturning and 3.0 for bearing capacity.

A series of laboratory tests were performed to determine mortar binder/aggregate ratios, aggregate gradation, and the presence or absence of portland cement. A recommended mortar type for repairs, repointing, and rebuilding is based on these findings.

3 Findings and Analysis

3.1 Carriage House Walls

The carriage house extends from the property into Du Bois Street, and measures approximately 16 feet by 10 feet in plan dimensions. Stone masonry walls at the south and west appear to retain soil under and around the structure, while the stone masonry retaining wall at the north functions as the third wall of the carriage house (Figure 2).

![Figure 2. Carriage house south and west walls (left), and north wall (right).](image)
The height of the south and west retaining walls increases from zero at the southeast where the wall begins from the street, to a maximum of 5'-4” where it meets the tall western portion of the roadside wall (not evaluated). The height of the north wall of the carriage house measured 8'-4” from the interior floor to the wood roof.

Locations of wall dimension measurements are shown in Figure 3. Wall height, thickness, and face surface profile at carriage house walls are listed in Table 1.

![Figure 3. Locations of carriage house wall dimension measurements.](image)

<table>
<thead>
<tr>
<th>Measurement Location</th>
<th>Wall Height</th>
<th>Thickness</th>
<th>Overall Batter</th>
<th>Batter %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>2'-8”</td>
<td>20 in.</td>
<td>¼ in.</td>
<td>0.8 %</td>
</tr>
<tr>
<td>3</td>
<td>3'-6”</td>
<td>16 in.</td>
<td>1 ½ in.</td>
<td>3.6 %</td>
</tr>
<tr>
<td>4</td>
<td>5'-4”</td>
<td>16 in.</td>
<td>4 ¼ in.</td>
<td>6.6 %</td>
</tr>
<tr>
<td>5</td>
<td>8'-4”</td>
<td>16 in.</td>
<td>3 ¾ in.</td>
<td>3.3 %</td>
</tr>
</tbody>
</table>

Joints between stones appeared to be fully repointed with relatively hard, modern mortar along the south wall as far as the southwest corner of the structure. The remaining length of the south wall and full extent of the west wall contained mostly empty joints with only occasional (fewer than 10%) partially mortared joints observed.

Analysis results for the wall using the measured thickness and measured height (Table 2) show capacities against sliding, overturning and bearing less than typically accepted factors of safety,
assuming that the wall is retaining soil full height. It is possible, however, due to the presence of shallow bedrock, the amount of soil retained by the wall is less than assumed in the analysis and the bearing capacities are higher than assumed (4,000 pound per square foot).

Table 2. Gravity analysis results for Carriage House walls.

<table>
<thead>
<tr>
<th>Stability Analysis</th>
<th>Overturning</th>
<th>Sliding</th>
<th>Bearing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\Sigma M_r$</td>
<td>42706 in-lb</td>
<td>restoring moment</td>
</tr>
<tr>
<td></td>
<td>$\Sigma M_0$</td>
<td>33590 in-lb</td>
<td>overturning moment</td>
</tr>
<tr>
<td>$FS_{ot}$</td>
<td>$\Sigma M_r/\Sigma M_0$</td>
<td>1.27</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$\mu \Sigma V$</td>
<td>1720 lb</td>
<td>sliding resistance force</td>
</tr>
<tr>
<td>$P_{a-h}$</td>
<td>1007.7 lb</td>
<td>sliding force</td>
<td></td>
</tr>
<tr>
<td>$FS_{sl}$</td>
<td>1.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$x = \Sigma M_a/\Sigma V$</td>
<td>0.25 ft</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$b/6$</td>
<td>0.32 ft</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$e$</td>
<td>0.71 ft</td>
<td></td>
</tr>
<tr>
<td>$\sigma_{max}$</td>
<td>2,991 lb/ft$^2$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$FS_{bc}$</td>
<td>1.34</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

References:

3.2 Roadside Wall
The portion of the roadside wall above the stairs and lower landing consists of stone masonry veneer over the stone masonry retaining wall. Veneer above the stairs can be seen supported by a sloped steel angle that runs adjacent to the inner stair stringer. Attachment of the angle to the wall beyond was not visible, but a vertical support rod is visible at about 2/3 height of the stairs. Overall views of the roadside wall are shown in Figure 4; the extent of the veneer section and measurement locations are shown in plan view in Figure 5. Wall height, thickness, and face surface profile at roadside walls are listed in Table 3.
Figure 4. Roadside retaining wall under stairs (left), veneer over retaining wall above stairs and landing, and remaining length of retaining wall (right).

Figure 5. Extent of veneer at roadside wall and measurement locations.

Table 3. Dimension measurements at roadside wall.

<table>
<thead>
<tr>
<th>Measurement Location</th>
<th>Wall Height</th>
<th>Thickness</th>
<th>Overall Batter</th>
<th>Batter %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9'-6&quot;</td>
<td>16 in.</td>
<td>8 ¼ in.</td>
<td>7.2 %</td>
</tr>
<tr>
<td>2</td>
<td>10'-0&quot;</td>
<td>18 in.</td>
<td>11 ¾ in.</td>
<td>9.8 %</td>
</tr>
<tr>
<td>3</td>
<td>10'-3&quot;</td>
<td>18 in.</td>
<td>10 in.</td>
<td>8.1 %</td>
</tr>
<tr>
<td>4</td>
<td>8'-10&quot;</td>
<td>18 in.</td>
<td>7 in.</td>
<td>6.6 %</td>
</tr>
<tr>
<td>5</td>
<td>8'-8&quot;</td>
<td>17 in.</td>
<td>3 ¾ in.</td>
<td>3.1 %</td>
</tr>
</tbody>
</table>

Analysis results for the wall using the minimum measured thickness and maximum measured height (Table 4) show capacities against sliding, overturning and bearing less than typically accepted factors of safety, assuming that the wall is retaining soil full height. It is possible, however, due to the presence of shallow bedrock, the amount of soil retained by the wall may less than assumed in the analysis. Analysis results for the wall is shown in Table 4.
Table 4. Gravity stability analysis for roadside wall.

<table>
<thead>
<tr>
<th>Stability Analysis</th>
<th>Overturning</th>
<th>Sliding</th>
<th>Bearing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ΣMr</td>
<td>51458 in-lb</td>
<td>restoring moment</td>
</tr>
</tbody>
</table>

References:

Visual and borescope observations were conducted at existing openings and holes drilled in mortar joints at a total of 11 locations throughout the roadside wall, including both retaining wall and veneer areas. Most mortar joints at the eastern portion of the roadside wall were eroded to a depth of at least 1 inch. Where mortar was observed at the surface in this area, it appeared to be a replacement mortar. Borescope observations in this wall section typically revealed voids to a depth of 5 to 7 inches and relatively solid beyond.

Surface conditions at the veneer wall were similar: most mortar joints eroded to a depth of about 1 inch, approximately 30% of joints void of mortar. The veneer wythe was measured 4 to 5 inches thick with a ½ to ¾ inch gap between the veneer and retaining wall beyond. The retaining wall behind the veneer was observed to contain variable mortar fill, with joints 50% - 70% filled at locations observed.

Below the stairs, where no veneer is present, mortar joints were observed mostly solid (90% or more) at the surface as well as full depth into the wall.

3.3 Garden Wall (East facing return of roadside wall)
The east facing return of the roadside wall runs adjacent to the eastern property line for approximately 17 feet from the southeast corner, shown in Figure 6. Wall height, thickness, and face surface profile are listed in Table 5. A gravity stability analysis shows that the wall is adequate for sliding, overturning, and bearing. Analysis results for the wall are shown in Table 6.
Figure 6. East facing return of roadside wall adjacent to property line and neighboring garden.

Table 5. Dimension measurements at garden wall.

<table>
<thead>
<tr>
<th>Measurement Location</th>
<th>Wall Height</th>
<th>Thickness</th>
<th>Overall Batter</th>
<th>Batter %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Garden</td>
<td>1’-6”</td>
<td>Varies: 8-12 in.</td>
<td>2 in.</td>
<td>17 - 25 %</td>
</tr>
</tbody>
</table>

Table 6. Gravity stability analysis for garden wall.

Stability Analysis

Overturning

\[ \Sigma M_r = 811 \text{ in-lb restoring moment} \]
\[ \Sigma M_0 = 201 \text{ in-lb overturning moment} \]

\[ FS_{ot} = \frac{\Sigma M_r}{\Sigma M_0} = 4.04 \]

Sliding

\[ \mu \Sigma V = 74 \text{ lb sliding resistance force} \]
\[ P_{a-h} = 33.5 \text{ lb sliding force} \]

\[ FS_{sl} = 2.22 \]

Bearing

\[ x = \frac{\Sigma M_A}{\Sigma V} = 0.39 \text{ ft} \]
\[ \frac{b}{6} = 0.15 \text{ ft} \]
\[ e = 0.04 \text{ ft} \]

\[ \sigma_{max} = 192 \text{ lb/ft}^2 \]
\[ FS_{bc} = 20.79 \]

References:
3.4 House Foundation Walls

Portions of the home’s stone masonry foundations are visible at south and west walls (Figure 7). A section of foundation measuring approximately 3 feet is collapsed near the east end of the front porch. A patch repair consisting of a relatively hard modern mortar is visible on the west elevation near the south corner. No measurable batter was observed at foundation walls. Wall thickness measurement locations are shown in Figure 8 and thickness measurements are shown in Table 7.

![Figure 7. Overall views of west (left) and south (right) stone masonry foundation walls.](image)

![Figure 8. Wall thickness measurements locations at house foundations.](image)
Table 7. Wall thickness measurements at house foundations.

<table>
<thead>
<tr>
<th>Measurement Location</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12 in.</td>
</tr>
<tr>
<td>2</td>
<td>12 in.</td>
</tr>
<tr>
<td>3</td>
<td>14 in.</td>
</tr>
<tr>
<td>4</td>
<td>15 in.</td>
</tr>
</tbody>
</table>

Observations at foundation walls found that mortar joints at the exterior surface were solidly filled, but only to a depth of 3-4 inches with the remaining wall thickness void of mortar.

An interior floor probe, opened by others, revealed that no basement or crawlspace is present under the floor, and thus foundation walls do not retain soil. A conservative gravity stability analysis shows that the wall is adequate for sliding and overturning. Analysis for bearing found capacity less than typically accepted factors of safety. Analysis results for the wall are shown in Table 8.

Table 8. Gravity stability analysis of stone foundation walls.

<table>
<thead>
<tr>
<th>Stability Analysis</th>
<th>Overturning</th>
<th>Sliding</th>
<th>Bearing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ΣMr = 20147 in-lb</td>
<td>μΣV = 880 lb</td>
<td>x = 0.62 ft</td>
</tr>
<tr>
<td></td>
<td>ΣM₀ = 8805 in-lb</td>
<td>Pₚₐ-h = 412.8 lb</td>
<td>b/6 = 0.29 ft</td>
</tr>
<tr>
<td></td>
<td>FSₜot = 2.29</td>
<td>FSₛₘ = 2.13</td>
<td>e = 0.26 ft</td>
</tr>
</tbody>
</table>

References

3.5 Shed Walls
The shed adjacent to the northwest corner of the house measures approximately 16 feet by 8 ½ feet in plan dimensions, and consists of stone masonry walls at east, west, and north walls (Figure 9). Measurement locations are shown in Figure 10. Wall dimension measurements are listed in Table 9.
Figure 9. Shed walls: exterior west (left), interior north (right).

Figure 10. Plan view of shed wall measurement locations.

Table 9. Dimension measurements at Wall 7.

<table>
<thead>
<tr>
<th>Measurement Location</th>
<th>Thickness</th>
<th>Overall Batter</th>
<th>Batter %</th>
</tr>
</thead>
<tbody>
<tr>
<td>East</td>
<td>27 in.</td>
<td>Plumb</td>
<td>0.0 %</td>
</tr>
<tr>
<td>North</td>
<td>Varies: 20-25 in.</td>
<td>1 ½ in. into shed over 8 ft height</td>
<td>1.5 %</td>
</tr>
<tr>
<td>West</td>
<td>24 in.</td>
<td>Plumb</td>
<td>0.0 %</td>
</tr>
</tbody>
</table>
Deeply eroded joints and missing mortar were observed at approximately 50% of visible wall surfaces at the shed. Large voids were visible between stone wythes throughout the shed walls at borescope observations. A portion of the west wall interior was observed to be parged with mortar and painted.

Gravity stability analysis results for the wall, shown in Table 10, using the minimum measured thickness and measured height show capacities against sliding, overturning and bearing less than typically accepted factors of safety, assuming that the wall is retaining soil full height. It is possible, however, due to the presence of shallow bedrock, the amount of soil retained by the wall is less than assumed in the analysis.

**Table 10. Gravity stability analysis of shed walls.**

<table>
<thead>
<tr>
<th>Stability Analysis</th>
<th>Overturning</th>
<th>Sliding</th>
<th>Bearing</th>
</tr>
</thead>
<tbody>
<tr>
<td>ΣMr</td>
<td>34167 in-lb</td>
<td>1599 lb</td>
<td>0.12 ft</td>
</tr>
<tr>
<td>ΣM0</td>
<td>30156 in-lb</td>
<td></td>
<td>0.30 ft</td>
</tr>
<tr>
<td>FSot</td>
<td>1.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>μΣV</td>
<td>1599 lb</td>
<td></td>
<td>0.78 ft</td>
</tr>
<tr>
<td>P_{a-h}</td>
<td>942.4 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FS_{sl}</td>
<td>1.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>x = ΣMa/ΣV</td>
<td>0.12 ft</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b/6</td>
<td>0.30 ft</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e</td>
<td>0.78 ft</td>
<td></td>
<td></td>
</tr>
<tr>
<td>σ_{max}</td>
<td>1,669 lb/ft²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FS_{bc}</td>
<td>2.40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**References**


3.6 CMU Retaining Wall

An interlocking or segmental concrete block retaining wall runs along the back (north) wall of the home. Joints do not contain mortar, and geosynthetic fabric is visible in bed joints. Investigation of CMU cells did not detect any metal reinforcing or grout; loose gravel-sized aggregate was observed in borescope observations of cells. Wall properties are shown in Table 11.

**Table 11. CMU retaining wall properties.**

<table>
<thead>
<tr>
<th>Measurement Location</th>
<th>Wall Height</th>
<th>Thickness</th>
<th>Overall Batter</th>
<th>Batter %</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMU Retaining Wall</td>
<td>13 feet</td>
<td>8 in. nominal</td>
<td>1 5/8 in.</td>
<td>1.0 %</td>
</tr>
</tbody>
</table>
A simple gravity analysis is not appropriate for the CMU wall, as it appears to be built as a soil-reinforced segmental retaining wall utilizing geosynthetic reinforcement. Although properties of the geosynthetic are not known, results of a MSE wall analysis assuming typical properties and standard design practices is shown in Table 12. A conservative gravity stability analysis shows that the wall is adequate for sliding and overturning. Analysis for bearing found capacity less than typically accepted factors of safety, however the actual bearing condition is unknown. It is possible that the wall bears on a constructed footing.

**Table 12. Results of MSE wall analysis for CMU retaining wall.**

<table>
<thead>
<tr>
<th></th>
<th>67283 lb-ft/ft resisting moment</th>
<th>17188 lb-ft/ft overturning moment</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\Sigma M_r$</td>
<td>67283</td>
<td>$\Sigma M_0$</td>
</tr>
<tr>
<td>$FS_{ot} = \Sigma M_r/\Sigma M_0$</td>
<td>3.91</td>
<td>$\phi V_1$</td>
</tr>
<tr>
<td></td>
<td>7535 lbs</td>
<td>7535 lbs sliding resistance force</td>
</tr>
<tr>
<td>$\Sigma F$</td>
<td>3966 lbs</td>
<td>sliding force</td>
</tr>
<tr>
<td>$FS_{sl}$</td>
<td>1.90</td>
<td>$M_{RBP}$</td>
</tr>
<tr>
<td></td>
<td>67283 lb-ft/ft resisting moment in applied pressure calculation</td>
<td></td>
</tr>
<tr>
<td>$e$</td>
<td>1.16 ft</td>
<td>$e &lt; L/6$</td>
</tr>
<tr>
<td>$L' = L - 2e$</td>
<td>6.78 ft</td>
<td>$\sigma_v$</td>
</tr>
<tr>
<td></td>
<td>2183 lb/ft$^2$ max. applied bearing pressure</td>
<td></td>
</tr>
<tr>
<td>$N_C$</td>
<td>30.14</td>
<td>$N_v$</td>
</tr>
<tr>
<td></td>
<td>22.40</td>
<td>$q_{ult}$</td>
</tr>
<tr>
<td></td>
<td>4000 lb/ft$^2$</td>
<td></td>
</tr>
<tr>
<td>$FS_{bc}$</td>
<td>1.83</td>
<td></td>
</tr>
</tbody>
</table>

**References**


4 Mortar Evaluation

A total of 4 mortar samples were evaluated by ANA. Sample identification and location are described in Table 13.

**Table 13. Mortar sample identification.**

<table>
<thead>
<tr>
<th>Sample ID</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>Roadside Wall</td>
</tr>
<tr>
<td>S2</td>
<td>Carriage House North Wall</td>
</tr>
<tr>
<td>S3</td>
<td>House Foundation, South Elevation near West End</td>
</tr>
<tr>
<td>S4</td>
<td>Shed North Wall Interior</td>
</tr>
</tbody>
</table>
4.1 Analysis Techniques

Chemical mortar examination followed the method described by Middendorf, et al\(^1\). The method is based on the use of acid digestion and chemical analysis to identify soluble silica resulting from Portland cement hydration. Aggregate sieve analysis followed requirements of ASTM C136, *Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates*. The method is based on acid digestion of the binder and sieve analysis of the aggregate. The results of acid digestion of the mortar samples are shown in Table 14. Samples S1 and S4 contained binder/aggregate ratios typical of modern and historic masonry mortars. Samples S2 and S3 contained binder/aggregate ratios that are not uncommon to historic mortars, but would be considered under-sanded by today’s mortar standards.

**Table 14. Results of acid digestion of mortar samples.**

<table>
<thead>
<tr>
<th>Sample ID</th>
<th>Mass before acid digestion (g)</th>
<th>Mass after acid digestion (g)</th>
<th>Binder mass (g)</th>
<th>Aggregate mass (g)</th>
<th>Binder volume (cm(^3))</th>
<th>Aggregate volume (cm(^3))</th>
<th>Total volume (cm(^3))</th>
<th>Binder (%)</th>
<th>Aggregate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>59.40</td>
<td>49.95</td>
<td>9.45</td>
<td>49.95</td>
<td>14.75</td>
<td>38.98</td>
<td>53.73</td>
<td>27</td>
<td>73</td>
</tr>
<tr>
<td>S2</td>
<td>62.66</td>
<td>42.81</td>
<td>19.85</td>
<td>42.81</td>
<td>30.98</td>
<td>33.41</td>
<td>64.39</td>
<td>48</td>
<td>52</td>
</tr>
<tr>
<td>S3</td>
<td>73.76</td>
<td>56.38</td>
<td>17.38</td>
<td>56.38</td>
<td>27.12</td>
<td>44.00</td>
<td>71.12</td>
<td>38</td>
<td>62</td>
</tr>
<tr>
<td>S4</td>
<td>57.03</td>
<td>48.55</td>
<td>8.48</td>
<td>48.55</td>
<td>13.23</td>
<td>37.89</td>
<td>51.12</td>
<td>26</td>
<td>74</td>
</tr>
</tbody>
</table>

4.2 Aggregate Sieve Analysis

The aggregate gradation curves, plotted in Figure 11, show the mortar aggregates of the samples compared to the gradation range of coarse and fine aggregates as specified by ASTM C144, *Standard Specification for Aggregate for Masonry Mortars*. The aggregate colors are shown in Figure 20. Ideally, the aggregate for the replacement mortar should match the color and gradation of the existing mortar aggregates. Trial mixtures may be required to arrive at a mix that matches the original mortar with respect to color and texture.

---

The gradation range specified for masonry mortar in ASTM C144 is indicated in dashed lines.

**Figure 11. Aggregate distribution by sieve size for mortar samples.**

**Figure 12. Aggregate distribution and color for furnished mortar samples.**
4.3 Binder Content and Recommended Mortar Formulation

In-place mortar throughout the property appears to have originally been a lime-sand mix, due to its relative softness and light binder color. Mortar appearance was generally uniform, except where repointing was apparent. Samples collected from the roadside wall from apparent repointing locations, and from the shed interior as a likely original “control” sample, and further analyzed for the presence of portland cement using the Middendorf method.

The chemical analysis results of the supplied mortar samples are summarized in Table 11. Similar minor amounts of portland cement were detected in both samples, resulting in mix formulas matching most closely with a Type K mortar.

<table>
<thead>
<tr>
<th>Sample ID</th>
<th>Sample Mass (g)</th>
<th>Aggregate Mass (g)</th>
<th>Soluble Silica (g)</th>
<th>Volumetric Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>10.00</td>
<td>7.87</td>
<td>0.14</td>
<td>1 3 10</td>
</tr>
<tr>
<td>S4</td>
<td>10.00</td>
<td>8.32</td>
<td>0.12</td>
<td>1 3 12</td>
</tr>
</tbody>
</table>

For repointing joints, crack repair, and rebuilding, ANA recommends the use of Type K mortar, with starting volumetric proportions of 1 part portland cement, 3 parts lime, and 9 to 12 parts sand. Type K mortar is relatively low strength and accommodating to historic masonry. Alternatively, where additional durability may be preferred, Type O mortar may be used. If used, Type O mortar should meet requirements of ASTM C270, Standard Specification for Mortar for Unit Masonry with volumetric proportions of 1 part portland cement, 2 parts lime, and 7 to 9 parts sand. Type O mortar is somewhat more suitable for locations that receive increased weather exposure. Table 16 summarizes recommended mortar mixes for repairs.

<table>
<thead>
<tr>
<th>Recommended Mortar Type</th>
<th>Volumetric Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Portland Cement</td>
</tr>
<tr>
<td>Type K: General repairs and repointing.</td>
<td>1</td>
</tr>
<tr>
<td>Type O: Alternate where additional durability is desired.</td>
<td>1</td>
</tr>
</tbody>
</table>

The minor portland cement component detected in mortar samples indicates that stone masonry construction may have taken place around the time it was gaining widespread use in the United States, circa early 1900’s.
5 Repair and Rebuilding Recommendations

Wall sections with cracked or heavily eroded mortar should be repaired using a deep repointing process, raking mortar out to a depth of at least 2 inches and pointing with new compatible mortar in lifts of no more than 1-¼ inches, compressing each lift and allowing to become thumbprint hard before proceeding with the next lift. This process most likely applies to most roadside wall surfaces, carriage house walls where not already repointed, garden wall, shed walls, and interior surfaces of foundation walls, if accessible.

The collapsed section of the house foundation under the porch should be rebuilt, fully bedding stones as they are reset.
Geotechnical Engineering Report

Proposed 241 Dubois Street Improvements

241 Dubois Street
Black Hawk, Colorado

November 8, 2016
Terracon Project No. 25165446

Prepared for:
City of Black Hawk
Black Hawk, Colorado

Prepared by:
Terracon Consultants, Inc.
Wheat Ridge, Colorado
November 8, 2016

City of Black Hawk
P.O. Box 68
Black Hawk, Colorado 80422

Attn:  c/o Scott McClelland
       E: scott.mcclelland@nv5.com

Re:  Geotechnical Engineering Report
     Proposed 241 Dubois Street Improvements
     241 Dubois Street
     Black Hawk, Colorado
     Terracon Project No. 25165446

Mr. McClelland:

Terracon Consultants, Inc. (Terracon) has completed the geotechnical engineering exploration for the above referenced project. This study was performed in general accordance with our proposal number P25165446, dated October 26, 2016. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning improvements to the existing building located at 241 Dubois Street in Black Hawk, Colorado.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of further service, please contact us.

Sincerely,

Terracon Consultants, Inc.

Scott B. Myers, P.E.
Geotechnical Department Manager

William D. Rethamel, P.E.
Senior Project Engineer

Enclosures
cc:  Addressee (PDF)
     1 - File
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**APPENDIX A – FIELD EXPLORATION**

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Exhibit C-2 Unified Soil Classification
Exhibit C-3 Description of Rock Properties
EXECUTIVE SUMMARY

A geotechnical engineering exploration has been prepared for the proposed improvements for the existing building located at 241 Dubois Street in Black Hawk, Colorado. Based on the information obtained from our subsurface exploration and the laboratory testing completed, the following geotechnical conditions will need to be considered:

- Based on the geotechnical engineering analyses, new foundation elements for the existing building may consist of spread footings underlain by native sand soils, gneiss bedrock or new engineered fill, provided the owner is willing to accept the associated risk of movement.

- As an alternative to new foundation elements for the existing building, the strength of the existing subgrade soils may be improved by implementing a ground modification technique. A ground modification technique that reduces the risk of damage to the existing foundation system, such as permeation grouting, would be an applicable ground modification technique for the subsurface conditions encountered at this site.

- Loose and low strength soils may be encountered on the site. Prior to placing fill or constructing foundations on soft/loose subgrade soils, it may be necessary to stabilize these soils with several passes of relatively heavy construction equipment along the bottom of the excavation to densify these materials.

- Based on the 2015 International Building Code, the seismic site classification for this site is C.

This summary should be used in conjunction with the entire report for design purposes. It should be recognized that details were not included or fully developed in this section, and the report must be read in its entirety for a comprehensive understanding of the items contained herein. The section titled GENERAL COMMENTS should be read for an understanding of the report limitations.
1.0 INTRODUCTION

A geotechnical engineering report has been prepared for the proposed improvements for the existing building located at 241 Dubois Street in Black Hawk, Colorado.

As part of our subsurface exploration, a representative from our office observed and documented the subsurface conditions exposed in five exploratory test pits. The test pits had been excavated prior to our site observation. Test Pit Logs along with an Aerial Image Exploration Plan are included in Appendix A of this report.

The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil and bedrock
- Groundwater levels
- Earthwork
- Lateral earth pressures
- Seismic site classification
- Subgrade Improvement
- New foundation design and construction
- Drainage

2.0 PROJECT INFORMATION

2.1 Project Description

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed construction</td>
<td>We understand the proposed improvements include the construction of new foundation elements for the existing building.</td>
</tr>
<tr>
<td>Anticipated foundation systems</td>
<td>Shallow spread footings</td>
</tr>
<tr>
<td>Maximum loads</td>
<td>Walls: 1 to 2 klf (assumed)</td>
</tr>
<tr>
<td></td>
<td>Columns: 2 to 5 kips (assumed)</td>
</tr>
<tr>
<td>Grading</td>
<td>None reported</td>
</tr>
<tr>
<td>Excavation depth</td>
<td>Up to about 3 feet (assumed)</td>
</tr>
<tr>
<td>Free-standing retaining walls</td>
<td>None reported</td>
</tr>
</tbody>
</table>
### 2.2 Site Location and Description

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>The proposed improvements will be made to the existing building located at 241 Dubois Street in Black Hawk, Colorado. The general location of the proposed project is 39.8037° N 105.4989° W.</td>
</tr>
<tr>
<td>Existing improvements</td>
<td>An existing single-story building is located on the subject site. The existing building appears to have been a single-family residence. We understand the existing building is constructed on a dry stack rock foundation system with a crawlspace.</td>
</tr>
</tbody>
</table>
Material Description | Approximate Depth to Bottom of Stratum below Existing Site Grade | Consistency/ Relative Density/ Hardness
---|---|---
Bedrock consisting of Gneiss | About 1 to 5 feet, Maximum depth of exploratory test pits | Not determined*

* - Because test pits had been excavated prior to our observation, the relative density of the soils and hardness of the bedrock could not be determined.

Stratification boundaries on the test pit logs represent the approximate location of changes in soil and material types; in-situ, the transition between materials may be gradual. Further details of the test pits can be found on the Test Pit Logs in Appendix A.

Based on laboratory test results, the on-site granular soils are considered to be non-expansive. Results of water soluble sulfate testing performed on samples obtained during our field exploration indicated “not applicable” and “moderate” severity with an exposure class of S0 and S1, respectively based on the American Concrete Institute guidelines. A summary of laboratory test results is included in Appendix B.

### 3.2 Groundwater

The test pits were observed for the presence of groundwater at the time of our site visit. The groundwater levels are noted on the Test Pit Logs, and are summarized below.

<table>
<thead>
<tr>
<th>Test Pit No.</th>
<th>Depth to groundwater at time of test pit observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>None observed</td>
</tr>
<tr>
<td>2</td>
<td>None observed</td>
</tr>
<tr>
<td>3</td>
<td>None observed</td>
</tr>
<tr>
<td>4</td>
<td>None observed</td>
</tr>
<tr>
<td>5</td>
<td>None observed</td>
</tr>
</tbody>
</table>

There observations represents the groundwater condition at the time of our site visit, and may not be indicative of other times or at other locations. Groundwater levels can be expected to fluctuate with varying seasonal and weather conditions.

Zones of perched and/or trapped groundwater may also occur at times in the subsurface soils overlying bedrock, on top of the bedrock surface or within permeable fractures in the bedrock materials. The location and amount of perched water is dependent upon several factors, including hydrologic conditions, type of site development, irrigation demands on or adjacent to the site, fluctuations in water features, seasonal and weather conditions.
Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff, and other factors not evident at the time. Groundwater levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the test pit logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

4.0 RECOMMENDATIONS FOR DESIGN AND CONSTRUCTION

4.1 Geotechnical Considerations

Based on subsurface conditions observed in the test pits, the site appears suitable for the proposed construction from a geotechnical point of view provided certain precautions and design and construction recommendations outlined in this report are followed. We have identified geotechnical conditions that could impact design and construction of the proposed improvements.

4.1.1 Difficult Excavation

Because cobbles were observed in the test pits and boulders were observed on the ground surface around the subject site, we anticipate excavations in the subsurface soils will be difficult and may require the use of excavation equipment capable of removing cobbles and small boulders. In addition, due to the granular nature of the on-site soils we anticipate the sides of the excavations will be subject to sloughing and caving.

4.2 Earthwork

The following presents recommendations for site preparation, excavation, subgrade preparation and placement of engineered fills on the project. All earthwork on the project should be observed and evaluated by Terracon.

4.2.1 Site Preparation

Strip and remove existing vegetation, organics and other deleterious materials from new foundation element locations, if applicable. All exposed surfaces should be free of mounds and depressions that could prevent uniform compaction.

Stripped materials consisting of vegetation, unsuitable fills and organic materials should be wasted from the site or used to revegetate landscaped areas or exposed slopes after completion of grading operations.

Where possible, new foundation element locations should be initially graded to create a relatively level surface to receive fill and to provide for a relatively uniform thickness of fill beneath the
proposed elements. All exposed areas that will receive fill, once properly cleared, should be moisture conditioned to near optimum moisture content and compacted.

Although evidence of underground facilities such as septic tanks and existing foundations were not observed in the test pits during the site reconnaissance, such features could be encountered during construction. If unexpected fills or underground facilities are encountered, such features should be removed and the excavation thoroughly cleaned prior to backfill placement and/or construction.

Due to the presence of cobbles, we anticipate that heavy-duty excavation equipment capable of removing cobbles and small boulders will be required to complete the necessary excavations.

4.2.2 Material Types
Engineered fill should meet the following material property requirements:

<table>
<thead>
<tr>
<th>Fill Type ¹</th>
<th>USCS Classification</th>
<th>Acceptable location for placement</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-site sand and gravel soils</td>
<td>SM, SW-SM, SP-SM, GP-GC</td>
<td>On-site sand and gravel soils are considered suitable for reuse as compacted fill below foundation areas provided granular soil particles are less than 6 inches in diameter³.</td>
</tr>
<tr>
<td>Imported soils</td>
<td>Varies</td>
<td>Imported soils meeting the gradation outlined herein can be considered acceptable for use as engineered fill beneath foundations.</td>
</tr>
</tbody>
</table>

1. Controlled, compacted fill should consist of approved materials that are free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade. A sample of each material type should be submitted to the geotechnical engineer for evaluation.

2. Care should be taken during the fill placement process to avoid zones of dis-similar fill. Improvements constructed over varying fill types are at a higher risk of differential movement compared to improvements over a uniform fill zone.

3. If granular soils with particle sizes on the order of 6 inches are used as fill for this project, care must be taken when placing these materials to reduce the risk of nesting and the creation of voids between the particles.

Imported soils for general fills (if required) should meet the following material property requirements:

<table>
<thead>
<tr>
<th>Gradation</th>
<th>Percent finer by weight (ASTM C136)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6”</td>
<td>100</td>
</tr>
<tr>
<td>No. 4 Sieve</td>
<td>50-100</td>
</tr>
<tr>
<td>No. 200 Sieve</td>
<td>15-25</td>
</tr>
</tbody>
</table>

- Liquid Limit………………………………………………………………………30 (max)
- Plasticity Index…………………………………………………………………15 (max)
- Maximum Expansive Potential (%)………………………………………0.5*
4.2.3 Compaction Requirements

Engineered fill should be placed and compacted in horizontal lifts, using equipment and procedures that will produce recommended moisture contents and densities throughout the lift.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fill lift thickness</strong></td>
<td>8-inches or less in loose thickness when heavy, self-propelled compaction equipment is used</td>
</tr>
<tr>
<td></td>
<td>4 to 6-inches in loose thickness when hand-guided equipment (i.e. jumping jack, plate compactor) is used</td>
</tr>
<tr>
<td><strong>Compaction requirements</strong> †</td>
<td>Minimum of 98% of the material’s standard Proctor maximum dry density (ASTM D698)</td>
</tr>
<tr>
<td><strong>Moisture content cohesionless soil (sand and gravel)</strong></td>
<td>-3 to +3 % of the optimum moisture content</td>
</tr>
</tbody>
</table>

1. We recommend that engineered fill be tested for water content and compaction during placement. Should the results of the in-place density tests indicate the specified water or compaction limits have not been met, the area represented by the test should be reworked and retested as required until the specified water and compaction requirements are achieved.

2. Water levels should be maintained low enough to allow for satisfactory compaction to be achieved.

4.2.4 Excavation and Trench Construction

Excavations into the subsurface soils will encounter a variety of conditions. Excavations into the on-site granular soils will be subject to sloughing and caving. The individual contractor(s) is responsible for designing and constructing stable, temporary excavations as required maintaining stability of both the excavation sides and bottom. All excavations should be sloped or shored in the interest of safety following local and federal regulations, including current Occupational Safety and Health Administration (OSHA) excavation and trench safety standards.

Soils penetrated by the proposed excavations may vary significantly across the site. The soil classifications are based solely on the materials observed in the exploratory test pits. The contractor should verify that similar conditions exist throughout the proposed area of excavation. If different subsurface conditions are encountered at the time of construction, the actual conditions should be evaluated to determine any excavation modifications necessary to maintain safe conditions.

As a safety measure, it is recommended that all vehicles and soil piles be kept to a minimum lateral distance from the crest of the slope equal to no less than the slope height. The exposed slope face should be protected against the elements.
4.2.5 Grading and Drainage
All grades must be adjusted to provide positive drainage away from the structure during construction and maintained throughout the life of the proposed project. Infiltration of water into utility or foundation excavations must be prevented during construction. Water permitted to pond near or adjacent to the perimeter of the structure (either during or post-construction) can result in significantly higher soil movements than those discussed in this report. As a result, any estimations of potential movement described in this report cannot be relied upon if positive drainage is not obtained and maintained, and water is allowed to infiltrate the fill and/or subgrade.

Exposed ground should be sloped at a minimum of 5 percent grade for at least 10 feet beyond the perimeter of the structure. Backfill against footings and in utility trenches should be well compacted and free of all construction debris to reduce the possibility of water infiltration. After building construction and prior to project completion, we recommend that verification of final grading be performed to document that positive drainage, as described above, has been achieved.

4.2.6 Earthwork Construction Considerations
Upon completion of grading operations, care should be taken to maintain the moisture content of the subgrade. Construction traffic over prepared subgrade should be minimized and avoided to the extent practical. Subsequent wetting of these materials will result in undesirable movement.

The site should also be graded to prevent ponding of surface water on prepared subgrade or in excavations. In areas where water is allowed to pond over a period of time, the affected area should be removed and allowed to dry out.

Although the exposed subgrade is anticipated to be relatively stable upon initial exposure, unstable subgrade conditions could develop during general construction operations, particularly if the soils are wetted and/or subjected to repetitive construction traffic. Should unstable subgrade conditions develop, stabilization measures will need to be employed. Options for subgrade stabilization can include removal of unsuitable material and replaced with approved fill material. An alternative can include the use of TX-140 Tensar geogrid (or approved equivalent) overlain by Colorado Department of Transportation (CDOT) Class 5 or 6 aggregate base course. The depth of aggregate base course will depend on the severity of unstable soils.

The geotechnical engineer should be retained during the construction phase of the project to observe earthwork and to perform necessary tests and observations during overexcavation operations, excavations, subgrade preparation; placement and compaction of controlled compacted fills, and backfilling of excavations into the completed subgrade.

4.2.7 Water Soluble Sulfate Test Results
The following table lists the results of laboratory water soluble sulfate testing. The test results may be used to estimate potential corrosive characteristics of the on-site soils with respect to
contact with the various underground materials that will be used for project construction:

<table>
<thead>
<tr>
<th>Test Pit No.</th>
<th>Sample depth (feet)</th>
<th>Soluble Sulfate(^1) (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 – 3.8</td>
<td>23</td>
</tr>
<tr>
<td>2</td>
<td>0 – 2.5</td>
<td>&lt;1</td>
</tr>
<tr>
<td>3</td>
<td>0 – 0.8</td>
<td>150</td>
</tr>
<tr>
<td>4</td>
<td>0 – 3.5</td>
<td>&lt;1</td>
</tr>
<tr>
<td>5</td>
<td>0 – 2</td>
<td>1</td>
</tr>
</tbody>
</table>

1. Results of soluble sulfate testing indicate that samples of the on-site soils have exposure classes of S0 and S1 when classified in accordance with Table 4.2.1 of the ACI Design Manual. The results of the testing indicate ASTM Type II Portland Cement is recommended for additional sulfate resistance of concrete in contact with on-site soils. Foundation concrete should be designed in accordance with the provisions of Section 318, Chapter 4, of the ACI Design Manual.

### 4.3 Foundation Recommendations

Based on the geotechnical engineering analyses, new foundation elements for the existing building may consist of spread footings underlain by native soils, bedrock or new engineered fill, provided the owner is willing to accept the associated risk of movement.

#### 4.3.1 Spread Footing Design Recommendations

Design recommendations for new spread footings are presented in the following paragraphs.

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overexcavation/modification depth</td>
<td>All existing fill must be removed</td>
</tr>
<tr>
<td></td>
<td>All existing fill and native soils must be removed to expose the underlying gneiss bedrock</td>
</tr>
<tr>
<td>Supporting stratum</td>
<td>Native soils or new engineered fill</td>
</tr>
<tr>
<td></td>
<td>Gneiss bedrock(^7)</td>
</tr>
<tr>
<td>Maximum net allowable bearing pressure(^1,2)</td>
<td>2,500 psf</td>
</tr>
<tr>
<td></td>
<td>7,000 psf</td>
</tr>
<tr>
<td>Minimum dead load pressure</td>
<td>N/A</td>
</tr>
<tr>
<td>Void Thickness, if needed</td>
<td>N/A</td>
</tr>
<tr>
<td>Coefficient of friction (sliding)</td>
<td>0.4</td>
</tr>
<tr>
<td>Ultimate Passive lateral equivalent fluid pressure(^3)</td>
<td>360 pcf</td>
</tr>
<tr>
<td>Minimum footing dimensions</td>
<td>Isolated footings: 24 inches</td>
</tr>
<tr>
<td></td>
<td>Continuous footings: 16 inches</td>
</tr>
</tbody>
</table>
Minimum embedment below finished grade for frost protection\(^4\) | 3 feet
---|---
Approximate total movement from foundation loads\(^5\) | About 1 inch | Less than about ½ inch
Estimated differential movement from foundation loads\(^5,6\) | About ½ to ¾ inch | Less than about ¼ inch

1. The recommended net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. This pressure assumes that any existing fill or lower strength soils, if encountered, will be excavated and replaced with engineered fill.

2. Maximum allowable soil bearing pressure can be increased by 1/3 for wind or seismic loads.

3. For evaluating resistance to lateral movement (or sliding). The sides of the excavation for new spread footings should be nearly vertical and backfill must be compacted to at least 95 percent of the standard Proctor maximum dry density for the passive earth pressure value to be valid. The passive resistance and the friction factor are ultimate values. As such, appropriate factors of safety should be applied to these values.

4. For perimeter footings, footings beneath unheated areas, and footings that will be exposed to freezing conditions during construction. Interior footings may bottom at a minimum depth of 12 inches below finished grade in heated areas.

5. Foundation movement will depend upon the variations within the subsurface soil profile, the structural loading conditions, the embedment depth of the footings, the thickness of engineered fill, and the quality of the earthwork operations and footing construction.

6. Differential settlement is considered over a distance of about 40 feet.

7. No fill may be placed below spread footings constructed on the gneiss bedrock. If excavations unintentionally extend below the bottom of the spread footings, additional concrete or flow fill should be placed in these areas.

Footings should be proportioned on the basis of equal total dead load pressure to reduce differential movement between adjacent footings. Additional foundation movements greater than those presented in the previous table could occur if water from any source infiltrates the foundation soils; therefore, proper drainage should be provided in the final design and during construction and throughout the life of the structure. Failure to maintain the proper drainage as recommended in the “Grading and Drainage” section of this report will nullify the movement estimates provided above.

4.3.2 Spread Footing Construction Considerations

New spread footings should only be considered if some foundation movement can be tolerated. The spread footings should be constructed on native soils, bedrock or new engineered fill.

While highly unlikely, unstable subgrade conditions may be encountered at the base of the footing excavations constructed on the native soils. Unstable subgrade soils will need to be stabilized prior to backfilling excavations and/or constructing foundation. The use of angular rock, recycled concrete and/or gravel pushed into the yielding subgrade is considered suitable means of
stabilizing the subgrade. The use of biaxial geogrid materials in conjunction with gravel could also be considered and could be more cost effective.

Unstable subgrade conditions should be observed by the geotechnical engineer to assess the subgrade and provide suitable alternatives for stabilization. Stabilized areas should be observed and documented prior to continuing construction to assess the stability of the subgrade.

4.4 Ground Modification
As an alternative to constructing new foundation elements for the existing building, the performance of the subgrade soils below the existing foundation system may be improved by implementing a ground modification technique. Permeation grouting is a ground modification technique that could be implemented at this site and would improve the performance of the soils below the existing foundation system and reduce the risk of damage to the existing foundation. The zone of soil that should be modified using this technique should extend vertically to the underlying gneiss bedrock and to an equal distance laterally. Based on observations of the subsurface conditions exposed in the exploratory test pits, the depth to the gneiss bedrock varied from about 1 foot to 4 feet below the relative ground surface at each test pit location. Because permeation grouting is a performance-based ground modification technique, we recommend a specialty contractor be contacted to provide the appropriate permeation grouting plan and anticipated performance of the subsurface soils after the permeation grouting has been performed.

4.5 Seismic Considerations
Based on our subsurface exploration and laboratory testing, it is our opinion that the soils have a low risk of liquefaction. The following table presents the seismic site classification based on the 2015 International Building Code:

<table>
<thead>
<tr>
<th>Code Used</th>
<th>Site Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015 International Building Code (IBC)</td>
<td>C</td>
</tr>
<tr>
<td>1. In general accordance with the 2012 International Building Code, Section 1613.3.2.</td>
<td></td>
</tr>
<tr>
<td>2. The 2015 International Building Code (IBC) requires a site soil profile determination extending a depth of 100 feet for seismic site classification. The current scope requested does not include the required 100 foot soil profile determination. The test pits for this exploration extended to a maximum depth of about 6 feet and this seismic site class definition considers that similar soil and bedrock conditions exist below the maximum depth of the subsurface exploration. Additional exploration to deeper depths could be performed to confirm the conditions below the current depth of exploration. Alternatively, a geophysical exploration could be utilized in order to attempt to justify a higher seismic site class.</td>
<td></td>
</tr>
</tbody>
</table>

4.6 Lateral Earth Pressures
Based on our understanding of the proposed construction, no below grade walls will be
constructed. However, we have provided the following information for crawl space walls less than about 6 feet in height. Walls with unbalanced backfill levels on opposite sides should be designed for earth pressures at least equal to those indicated in the following table. Earth pressures will be influenced by structural design of the walls, conditions of wall restraint, methods of construction and/or compaction and the strength of the materials being restrained. Two wall restraint conditions are shown. Active earth pressure is commonly used for design of walls that are able to move in order to “mobilize” the active earth pressures. The “at-rest” condition assumes no wall movement. The recommended design lateral earth pressures do not include a factor of safety and do not provide for possible hydrostatic pressure on the walls.

**EARTH PRESSURE COEFFICIENTS**

<table>
<thead>
<tr>
<th>Earth Pressure Conditions</th>
<th>Coefficient For Backfill Type¹</th>
<th>Equivalent Fluid Density (pcf)</th>
<th>Surcharge Pressure, p₁ (psf)</th>
<th>Earth Pressure, p₂ (psf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active (Ka)</td>
<td>0.33</td>
<td>40</td>
<td>(0.33)S</td>
<td>(40)H</td>
</tr>
<tr>
<td>At-Rest (Ko)</td>
<td>0.50</td>
<td>60</td>
<td>(0.50)S</td>
<td>(60)H</td>
</tr>
<tr>
<td>Passive (Kp)</td>
<td>3.0</td>
<td>360</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

1. Granular materials are considered to be sands or gravels with a maximum of 20 percent passing the No. 200 sieve.

Applicable conditions to the above include:

- For active earth pressure, wall must rotate about base, with top lateral movements of about 0.002 H to 0.004 H, where H is wall height
- For passive earth pressure to develop, wall must move horizontally to mobilize resistance.
- Uniform surcharge, where S is surcharge pressure
- In-situ soil backfill weight a maximum of 120 pcf
Horizontal backfill, compacted to at least 95 percent of standard Proctor maximum dry density
- Loading from heavy compaction equipment not included
- No hydrostatic pressures acting on wall
- No dynamic loading
- No safety factor included in soil parameters

Based on the design of the proposed valve vaults we recommend the walls be designed using combined hydrostatic and lateral earth pressures for lean clay backfill using an equivalent fluid weighing 90 and 100 pcf for active and at-rest conditions, respectively. For granular backfill, an equivalent fluid weighing 85 and 90 pcf should be used for active and at-rest, respectively. The hydrostatic pressure from the groundwater should be assumed to be applied at a depth of 6 feet below the finished ground surface. These pressures do not include the influence of surcharge, which should be added. Heavy equipment should not operate within a distance closer than the exposed height of retaining walls to prevent lateral pressures more than those provided.

The preceding data are also applicable to cast-in-place concrete or modular block retaining walls up to 6 feet in height. **If taller single walls, tiered walls, or Mechanically Stabilized Earth (MSE) walls will be included in the proposed development, additional site-specific studies and laboratory testing will be required.** In addition, the wall designer should perform standard wall design practices including analysis for overturning, sliding, bearing capacity and global stability, and results of these analyses should be provided for our review. Additional sampling, laboratory testing and document review associated with retaining walls is beyond the original scope of work but can be performed as a separate scope, for a separate fee.

### 5.0 GENERAL COMMENTS

Terracon should be retained to review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. Terracon also should be retained to provide observation and testing services during excavation, foundation construction and other earth-related construction phases of the project.

The analysis and recommendations presented in this report are based upon observations of the subsurface conditions exposed in the test pits performed at the indicated location and from other information discussed in this report. This report does not reflect variations that may occur between the test pits, across the site or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. If variations appear, we should be immediately notified so that further evaluation and supplemental recommendations can be provided.
The scope of services for this project does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing.
APPENDIX A

FIELD EXPLORATION
Field Exploration Description

The location of the exploratory test pits are presented in Exhibit A-3. The latitude and longitude coordinates of the test pit locations were obtained by a recreational grade GPS unit. The accuracy of the latitude and longitude values is typically about +/- 25 feet when obtaining the values using this method. The accuracy of the test pit locations should only be assumed to the level implied by the methods used.

The test pits were pre-excavated prior to our site visit. Lithologic logs of the test pits were recorded by the field engineer based on observations of the materials exposed in the sides of the test pits and the spoil piles adjacent to the test pits. Bulk samples were obtained from the sides of the test pits and from the spoil piles.

Groundwater observations were performed during our observations of the subsurface conditions exposed in the exploratory test pits. We understand the test pits will be backfilled by others at a later date.
SITE LOCATION

PROPOSED 241 DUBOIS STREET IMPROVEMENTS
241 DUBOIS STREET
BLACK HAWK, COLORADO

TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY
QUADRANGLES INCLUDE: CENTRAL CITY, CO (1/1/1972) and BLACK HAWK, CO (1/1/1972).
<table>
<thead>
<tr>
<th>DEPTH</th>
<th>LATITUDE/LONGITUDE</th>
<th>SAMPLE TYPE</th>
<th>PERCENT FINES</th>
<th>ATTERBERG LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8</td>
<td>39.803684° / -105.498819°</td>
<td>SILTY SAND (SM), with gravel and organics, trace cobbles, fine to coarse grained, brown to gray</td>
<td>45-35-10</td>
<td>17</td>
</tr>
<tr>
<td>3.8</td>
<td>39.803684° / -105.498819°</td>
<td>POORLY GRADED GRAVEL (GP), with cobbles and clay, fine to coarse grained, gray to light brown</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.0</td>
<td>39.803684° / -105.498819°</td>
<td>GNEISS BEDROCK, brown</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>39.803684° / -105.498819°</td>
<td>Test Pit Terminated at 5 Feet</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Stratification lines are approximate. In-situ, the transition may be gradual.

**Notes:**

- **Advancement Method:** Test pit was pre-excavated
- **Abandonment Method:** Test pit to be backfilled by others
- **Water Level Observations:** None observed

**Location:**

- Latitude: 39.803684°
- Longitude: -105.498819°

**Test Pit Details:**

- **Test Pit Start:** 10/11/2016
- **Test Pit End:** 10/11/2016
- **Operator:** Pre-excavated
- **Excavator:** Pre-excavated

**Project Information:**

- **Client:** City of Blackhawk
- **Site:** 241 Dubois Street
- **Client:** City of Blackhawk
- **Project:** Proposed 241 Dubois Street Improvements

**Additional Information:**

- **Exhibit A-1:** Description of field procedures
- **Appendix B:** Description of laboratory procedures and additional data (if any)
- **Appendix C:** Explanation of symbols and abbreviations

**Address:**

- 10625 W I 70 Frontage Rd N Ste 3
  - Wheat Ridge, CO

**Project No.: 25165446**

**Exhibit:** A-4
### TEST PIT LOG NO. 2

**PROJECT:** Proposed 241 Dubois Street Improvements  
**SITE:** 241 Dubois Street  
Blackhawk, Colorado  
**CLIENT:** City of Blackhawk  

<table>
<thead>
<tr>
<th>DEPTH</th>
<th>LOCATION</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>PERCENT FINES</th>
<th>LL-PL-PI</th>
<th>ATTERBERG LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>FILL - WELL GRADED GRAVEL (SM), with silt, gravel and cobbles, fine to coarse grained, brown</td>
<td></td>
<td></td>
<td></td>
<td>32-25-7 12</td>
</tr>
<tr>
<td>2.5</td>
<td>WELL GRADED GRAVEL (GP), with silt, gravel and cobbles, fine to coarse grained, yellow-brown</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.0</td>
<td>GNEISS BEDROCK, yellow-brown</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Test Pit Terminated at 5 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

**Aspen**: Test pit was pre-excavated

**Abandonment Method**: Test pit to be backfilled by others

**Notes**: See Exhibit A-1 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.

**WATER LEVEL OBSERVATIONS**

- None observed

---

**SITE INFORMATION**:  
Latitude: 39.803669°  
Longitude: -105.498867°

---

**PROJECT**: Proposed 241 Dubois Street Improvements

**SITE**: 241 Dubois Street  
Blackhawk, Colorado

**LOCATION**: See Exhibit A-2

Latitude: 39.803669°  
Longitude: -105.498867°

---

**ADDITIONAL INFORMATION**:  
Test Pit Started: 10/11/2016  
Test Pit Completed: 10/11/2016

Excavator: Pre-excavated  
Operator:  
Project No.: 25165446  
Exhibit: A-5
**PROJECT:** Proposed 241 Dubois Street Improvements  
**SITE:** 241 Dubois Street  
Blackhawk, Colorado  

**LOCATION** See Exhibit A-2  
Latitude: 39.803726°    Longitude: -105.49886°

<table>
<thead>
<tr>
<th>DEPTH (Ft.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>LL-PL-PI</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3</td>
<td>CONCRETE FLOOR SLAB, (About 4 inches)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.8</td>
<td>FILL - POORLY GRADED GRAVEL (GP), with sand and cobbles, fine to coarse grained, brown</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>GNEISS BEDROCK, brown</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Test Pit Terminated at 1 Foot

Stratification lines are approximate. In-situ, the transition may be gradual.

**Advancement Method:**  
Test pit was pre-excavated

**Abandonment Method:**  
Test pit to be backfilled by others

---

**WATER LEVEL OBSERVATIONS**

None observed

---

**Notes:**

Test Pit Started: 10/11/2016  Test Pit Completed: 10/11/2016

Operator:

Pre-excavated

Excavator:

Excavator: Pre-excavated

Project No.: 25165446

Exhibit: A-6

---

**Exhibit:** A-6

---

**Address:** 10625 W I 70 Frontage Rd N Ste 3  
**City:** Wheat Ridge, CO  
**Client:** City of Blackhawk

---
### TEST PIT LOG NO. 4

**PROJECT:** Proposed 241 Dubois Street Improvements  
**SITE:** 241 Dubois Street  
Blackhawk, Colorado

**CLIENT:** City of Blackhawk

- **LOCATION:** See Exhibit A-2  
  - Latitude: 39.803654°  
  - Longitude: -105.499045°

### DEPTH

<table>
<thead>
<tr>
<th>FILL - POORLY GRADED SAND (SP-SM)</th>
<th>with brick fragments and organics, fine to coarse grained, gray to brown</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.8</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POORLY GRADED SAND (SP-SM)</th>
<th>with silt, gravel and cobbles, fine to coarse grained, yellow-brown</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GNEISS BEDROCK</th>
<th>brown</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0</td>
<td></td>
</tr>
</tbody>
</table>

**Test Pit Terminated at 5 Feet**

Stratification lines are approximate. In-situ, the transition may be gradual.

### WATER LEVEL OBSERVATIONS

None observed

---

**Notes:**

- Advancement Method: Test pit was pre-excavated  
- Abandonment Method: Test pit to be backfilled by others

**Excavator:** Pre-excavated  
**Operator:**

**Project No.:** 25165446  
**Exhibit:** A-7

---

**THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 25165446.GPJ TERRACON2015.GDT 11/8/16**
## TEST PIT LOG NO. 5

**PROJECT:** Proposed 241 Dubois Street Improvements  
**SITE:** 241 Dubois Street  
Blackhawk, Colorado  
**CLIENT:** City of Blackhawk

### LOCATION
See Exhibit A-2  
Latitude: 39.803691°  Longitude: -105.499049°

### GRAPHIC LOG

<table>
<thead>
<tr>
<th>DEPTH (Ft.)</th>
<th>DEPTH (Ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>5.0</td>
<td></td>
</tr>
</tbody>
</table>

**FILL - SILTY SAND (SM),** with gravel, cobbles and brick fragments, fine to coarse grained, brown

2.0

**GNEISS BEDROCK,** brown

5.0

**Test Pit Terminated at 5 Feet**

<table>
<thead>
<tr>
<th>DEPTH (Ft.)</th>
<th>DEPTH (Ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

### PERCENT FINES

<table>
<thead>
<tr>
<th>ATTERBERG LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>LL-PL-PI</td>
</tr>
<tr>
<td>34-29-5</td>
</tr>
<tr>
<td>10</td>
</tr>
</tbody>
</table>

### WATER LEVEL OBSERVATIONS

**None observed**

---

**Notes:**

- Advancement Method: Test pit was pre-excavated  
- Abandonment Method: Test pit to be backfilled by others  
- See Exhibit A-1 for description of field procedures
- See Appendix B for description of laboratory procedures and additional data (if any)
- See Appendix C for explanation of symbols and abbreviations

---

**Exhibit:** A-8
APPENDIX B
LABORATORY TESTING
Laboratory Testing Description
Samples retrieved during the field exploration were returned to the laboratory for observation by the project geotechnical engineer, and were classified in general accordance with the Unified Soil Classification System and Description of Rock Properties in Appendix C.

At this time, an applicable laboratory-testing program was formulated to determine engineering properties of the subsurface materials. Following the completion of the laboratory testing, the field descriptions were confirmed or modified as necessary, and the Test Pit Logs were prepared. The Test Pit Logs are included in Appendix A.

Laboratory test results are included in Appendix B. These results were used for the geotechnical engineering analyses and the development of foundation and earthwork recommendations. All laboratory tests were performed in general accordance with the applicable local or other accepted standards.

Selected soil samples were tested for the following engineering properties:

- Grain size distribution
- Atterberg limits
- Water soluble sulfate content
# Grain Size Distribution

**ASTM D422 / ASTM C136**

![Graph of Grain Size Distribution](image)

**Identification of Materials:**
- **Cobbles:** Coarse or fine, depending on the sample.
- **Gravel:** Coarse, medium, or fine, depending on the sample.
- **Sand:** Coarse, medium, or fine, depending on the sample.
- **Silt or Clay:**

<table>
<thead>
<tr>
<th>Boring ID</th>
<th>Depth</th>
<th>USCS Classification</th>
<th>AASHTO Classification</th>
<th>LC GARL (%Gravel)</th>
<th>%Gravel</th>
<th>%Sand</th>
<th>%Silt</th>
<th>%Fines</th>
<th>%Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0-3.8</td>
<td>SILTY SAND (SM)</td>
<td>A-2-5 (0)</td>
<td>10</td>
<td>11.6</td>
<td>57.7</td>
<td>16.7</td>
<td>10.2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0-2.5</td>
<td>WELL-GRADED SAND with Silt and GRAVEL (SW-SM)</td>
<td>A-2-4 (0)</td>
<td>143</td>
<td>20.4</td>
<td>67.9</td>
<td>11.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0-0.8</td>
<td>POORLY GRADED GRAVEL with SILTY CLAY and SAND (GP-GC)</td>
<td>A-1-a (0)</td>
<td>23</td>
<td>47.6</td>
<td>42.6</td>
<td>9.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0-3.5</td>
<td>POORLY GRADED SAND with Silt and GRAVEL (SP-SM)</td>
<td>A-1-b (0)</td>
<td>38</td>
<td>26.9</td>
<td>63.0</td>
<td>11.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- Laboratory tests are not valid if separated from original report. Grain size: USCS & AASHTO combined.
- Project number: 25165446.
- Project: Proposed 241 Dubois Street Improvements.
- Site: 241 Dubois Street, Blackhawk, Colorado.
- Client: City of Blackhawk.
- Exhibit: B-2.
## Grain Size Distribution

### ASTM D422 / ASTM C136

**U.S. Sieve Opening in Inches**

<table>
<thead>
<tr>
<th>U.S. Sieve Numbers</th>
<th>Hydrometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>100</td>
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<tr>
<td>100</td>
<td>95</td>
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<td>80</td>
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<tr>
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</table>

### U.S. Sieve Numbers

<table>
<thead>
<tr>
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<th>57</th>
<th>52</th>
<th>47</th>
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<tr>
<td>100</td>
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<td>70</td>
<td>65</td>
<td>60</td>
<td>55</td>
<td>50</td>
<td>45</td>
<td>40</td>
</tr>
</tbody>
</table>

### Grain Size in Millimeters

**Percent Finer by Weight**

- **Gravel**
  - Coarse
  - Fine
- **Sand**
  - Coarse
  - Medium
  - Fine
- **Cobble**
  - Coarse
  - Fine
- **Silt or Clay**

### Laboratory Tests

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS & AASHTO COMBINED 25165446.GPJ TERRACON2015.GDT 11/8/16

**Boring ID** | **Depth** | **USCS Classification** | **AASHTO Classification** | **WC (%)** | **LL** | **PL** | **PI** | **Cc** | **Cr** |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>0 - 2</td>
<td>SILTY SAND with GRAVEL (SM)</td>
<td>A-1-a (0)</td>
<td>34</td>
<td>29</td>
<td>5</td>
<td>0.15</td>
<td>466.88</td>
<td></td>
</tr>
</tbody>
</table>

**Boring ID** | **Depth** | **D<sub>100</sub>** | **D<sub>50</sub>** | **D<sub>20</sub>** | **D<sub>10</sub>** | **%Gravel** | **%Sand** | **%Silt** | **%Fines** | **%Clay** |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>0 - 2</td>
<td>100</td>
<td>38.285</td>
<td>0.687</td>
<td>0.082</td>
<td>15.8</td>
<td>39.0</td>
<td>9.5</td>
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</tr>
</tbody>
</table>

### Project Details

**PROJECT: Proposed 241 Dubois Street Improvements**

**SITE:** 241 Dubois Street  
Blackhawk, Colorado

**PROJECT NUMBER:** 25165446

**CLIENT:** City of Blackhawk

**EXHIBIT:** B-3

**10625 W I 70 Frontage Rd N Ste 3**  
**Wheat Ridge, CO**
### SUMMARY OF LABORATORY TEST RESULTS

Proposed 241 Dubois Street Improvements - Black Hawk, Colorado
Terracon Project No. 25165446

<table>
<thead>
<tr>
<th>Test Pit No.</th>
<th>Depth (ft.)</th>
<th>USCS Class.</th>
<th>Particle Size Distribution, Percent Passing by Weight</th>
<th>Atterberg Limits</th>
<th>Water Soluble Sulfates (mg/l)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 - 3.8</td>
<td>SM</td>
<td>100 86 86 86 74 63 36 17</td>
<td>45 10 23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0 - 2.5</td>
<td>SW-SM</td>
<td>100 100 100 91 80 64 32 12</td>
<td>32 7 &lt;1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0 - 0.8</td>
<td>GP-GC</td>
<td>100 100 77 69 52 42 25 10</td>
<td>26 5 150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0 - 3.5</td>
<td>SP-SM</td>
<td>100 91 91 89 74 62 35 11</td>
<td>28 4 &lt;1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0 - 2.0</td>
<td>SM</td>
<td>100 64 60 55 49 41 24 10</td>
<td>34 5 1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Notes:
- Initial Dry Density and Initial Water Content are in-situ values unless otherwise noted.
- * = Partially disturbed sample
- * = Compression/settlement
- NV = no value
- NP = non-plastic

### Remarks:
1. Remolded Compacted density (about 95% of ASTM D698 maximum density near optimum moisture content)
2. Remolded Compacted density (about 95% of ASTM D1557 maximum density near optimum moisture content)
3. Water added to sample
4. Dry density and/or moisture content determined from one ring of a multi-ring sample
5. Minus #200 Only
7. Moisture-Density Relationship Test Method ASTM D1557/AASHTO T180

Exhibit B-4
APPENDIX C

SUPPORTING DOCUMENTS
### GENERAL NOTES

#### DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

<table>
<thead>
<tr>
<th>SYMBOLS</th>
<th>ABBREVIATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Auger" /></td>
<td>Auger</td>
</tr>
<tr>
<td><img src="image" alt="Shelby Tube" /></td>
<td>Shelby Tube</td>
</tr>
<tr>
<td><img src="image" alt="Split Spoon" /></td>
<td>Split Spoon</td>
</tr>
<tr>
<td><img src="image" alt="Rock Core" /></td>
<td>Rock Core</td>
</tr>
<tr>
<td><img src="image" alt="Macro Core" /></td>
<td>Macro Core</td>
</tr>
<tr>
<td><img src="image" alt="Modified California Ring Sampler" /></td>
<td>Modified California Ring Sampler</td>
</tr>
<tr>
<td><img src="image" alt="Grab Sample" /></td>
<td>Grab Sample</td>
</tr>
<tr>
<td><img src="image" alt="No Recovery" /></td>
<td>No Recovery</td>
</tr>
<tr>
<td><img src="image" alt="Modified Dames &amp; Moore Ring Sampler" /></td>
<td>Modified Dames &amp; Moore Ring Sampler</td>
</tr>
</tbody>
</table>

#### WATER LEVEL

- **Water Initially Encountered**
- **Water Level After a Specified Period of Time**
- **Water Level After a Specified Period of Time**

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

#### FIELD TESTS

- (HP) Hand Penetrometer
- (T) Torvane
- (PfT) Standard Penetration Test (blows per foot)
- N N value
- (PID) Photo-ionization Detector
- (OVA) Organic Vapor Analyzer

### DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

### LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/− indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

### RELATIVE DENSITY OF COARSE-GRAINED SOILS

(50% or more retained on No. 200 sieve.) Density determined by Standard Penetration Resistance includes gravel, sands and silts.

<table>
<thead>
<tr>
<th>STRENGTH TERMS</th>
<th>Standard Penetration or N-value Blows/ft.</th>
<th>Ring Sampler Blows/ft.</th>
<th>Descriptive Term (Consistency)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Loose</td>
<td>0 - 3</td>
<td>0 - 6</td>
<td>Very Soft less than 500</td>
</tr>
<tr>
<td>Loose</td>
<td>4 - 9</td>
<td>7 - 18</td>
<td>Soft</td>
</tr>
<tr>
<td>Medium Dense</td>
<td>10 - 29</td>
<td>19 - 58</td>
<td>Medium-Stiff 1,000 to 2,000</td>
</tr>
<tr>
<td>Dense</td>
<td>30 - 50</td>
<td>59 - 98</td>
<td>Stiff</td>
</tr>
<tr>
<td>Very Dense</td>
<td>&gt; 50</td>
<td>&gt; 99</td>
<td>Very Stiff 4,000 to 8,000</td>
</tr>
<tr>
<td>Hard</td>
<td>&gt; 8,000</td>
<td>&gt; 30</td>
<td>Very Hard</td>
</tr>
</tbody>
</table>

### CONSISTENCY OF FINE-GRAINED SOILS

(50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance.

<table>
<thead>
<tr>
<th>STRENGTH TERMS</th>
<th>Consistency of Fine-Grained Soils</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Loose</td>
<td>Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance</td>
</tr>
<tr>
<td>Loose</td>
<td>Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance</td>
</tr>
<tr>
<td>Medium Dense</td>
<td>Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance</td>
</tr>
<tr>
<td>Dense</td>
<td>Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance</td>
</tr>
<tr>
<td>Very Dense</td>
<td>Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance</td>
</tr>
</tbody>
</table>

### BEDROCK

<table>
<thead>
<tr>
<th>STRENGTH TERMS</th>
<th>Standard Penetration or N-value Blows/ft.</th>
<th>Ring Sampler Blows/ft.</th>
<th>Descriptive Term (Consistency)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weathered</td>
<td>&lt; 30</td>
<td>&lt; 20</td>
<td>Weathered</td>
</tr>
<tr>
<td>Firm</td>
<td>30 - 49</td>
<td>20 - 29</td>
<td>Firm</td>
</tr>
<tr>
<td>Medium Hard</td>
<td>50 - 89</td>
<td>30 - 49</td>
<td>Medium Hard</td>
</tr>
<tr>
<td>Hard</td>
<td>90 - 119</td>
<td>&gt; 79</td>
<td>Hard</td>
</tr>
</tbody>
</table>

### RELATIVE PROPORTIONS OF SAND AND GRAVEL

- **Descriptive Term(s) of other constituents**
- **Percent of Dry Weight**
- **Major Component of Sample**
- **Particle Size**

<table>
<thead>
<tr>
<th>Trace</th>
<th>With</th>
<th>Modifier</th>
<th>Percent of Dry Weight</th>
<th>Major Component of Sample</th>
<th>Particle Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 15</td>
<td>15 - 29</td>
<td>&gt; 30</td>
<td>12 in. (300 mm)</td>
<td>Boulders</td>
<td>Over 12 in. (300 mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 in. to #4 sieve (75mm to 4.75 mm)</td>
<td>Cobbles</td>
<td>12 in. to 3 inch (300mm to 75mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>#4 to #200 sieve (4.75 mm to 0.075mm)</td>
<td>Gravel</td>
<td>3 in. to #4 sieve (75mm to 4.75 mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Passing #200 sieve (0.075mm)</td>
<td>Sand</td>
<td>#4 to #200 sieve (4.75 mm to 0.075mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Silt or Clay</td>
<td>Silt or Clay</td>
<td>#4 to #200 sieve (4.75 mm to 0.075mm)</td>
</tr>
</tbody>
</table>

### RELATIVE PROPORTIONS OF FINES

<table>
<thead>
<tr>
<th>Trace</th>
<th>With</th>
<th>Modifier</th>
<th>Percent of Dry Weight</th>
<th>Term</th>
<th>Plasticity Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 5</td>
<td>5 - 12</td>
<td>&gt; 12</td>
<td>Non-plastic</td>
<td>0</td>
<td>1 - 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Low</td>
<td>11 - 30</td>
<td>&gt; 30</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Medium</td>
<td>11 - 30</td>
<td>&gt; 30</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>High</td>
<td>11 - 30</td>
<td>&gt; 30</td>
</tr>
</tbody>
</table>

### PLASTICITY DESCRIPTION

- **Term**
- **Plasticity Index**

- Non-plastic
- Low
- Medium
- High

Exhibit C-1
# UNIFIED SOIL CLASSIFICATION SYSTEM

## Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests

<table>
<thead>
<tr>
<th>Coarse Grained Soils: More than 50% retained on No. 200 sieve</th>
<th>Group</th>
<th>Symbol</th>
<th>Group Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravels: More than 50% of coarse fraction retained on No. 4 sieve</td>
<td>Clean Gravels: Less than 5% fines</td>
<td>Cu ≥ 4 and 1 ≤ Cc ≤ 3</td>
<td>GW Well-graded gravel</td>
</tr>
<tr>
<td></td>
<td>Gravels with Fines: More than 12% fines</td>
<td>Cu &lt; 4 and/or 1 &gt; Cc &gt; 3</td>
<td>GP Poorly graded gravel</td>
</tr>
<tr>
<td></td>
<td>Finishes classify as ML or MH</td>
<td>GM Silty gravel</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Finishes classify as CL or CH</td>
<td>GC Clayey gravel</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fine-Grained Soils: 50% or more passes the No. 200 sieve</th>
<th>Inorganic: Liquid limit - oven dried</th>
<th>PI &gt; 7 and plots on or above “A” line</th>
<th>CI Lean clay</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Liquid limit - not dried</td>
<td>PL &lt; 4 or plots below “A” line</td>
<td>ML Silt</td>
</tr>
<tr>
<td></td>
<td>&lt; 0.75</td>
<td>CI &lt; 4 or plots below “A” line</td>
<td>OL Organic clay</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Silts and Clays: Liquid limit less than 50</th>
<th>Organic: Liquid limit - oven dried</th>
<th>PI plots on or above “A” line</th>
<th>CI Lean clay</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Liquid limit - not dried</td>
<td>PL plots below “A” line</td>
<td>CI &lt; 4 or plots below “A” line</td>
</tr>
<tr>
<td></td>
<td>&lt; 0.75</td>
<td>CI &lt; 4 or plots below “A” line</td>
<td>OL Organic clay</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Silts and Clays: Liquid limit 50 or more</th>
<th>Inorganic: Liquid limit - oven dried</th>
<th>PI plots on or above “A” line</th>
<th>CI Lean clay</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Liquid limit - not dried</td>
<td>PL plots below “A” line</td>
<td>CI &lt; 4 or plots below “A” line</td>
</tr>
<tr>
<td></td>
<td>&lt; 0.75</td>
<td>CI &lt; 4 or plots below “A” line</td>
<td>OL Organic clay</td>
</tr>
</tbody>
</table>

## Highly organic soils: Primarily organic matter, dark in color, and organic odor

- Peat (PT)

---

**A** Based on the material passing the 3-inch (75-mm) sieve

**B** If field sample contained cobbles or boulders, or both, add “with cobbles or boulders, or both” to group name.

**C** Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

**D** Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.

**E** Cu = D_{60}/D_{10}

**F** If soil contains ≥ 15% sand, add “with sand” to group name.

---

**For classification of fine-grained soils and fine-grained fraction of coarse-grained soils**

- Equation of “A” - line: Horizontal at PI=4 to LL=25.5, then PI=0.73 (LL=20)
- Equation of “U” - line: Vertical at LL=16 to PI=7, then PI=0.9 (LL=8)

---

**Exhibit C-2**
DESCRIPTION OF ROCK PROPERTIES

WEATHERING

Fresh  
Rock fresh, crystals bright, few joints may show slight staining. Rock rings under hammer if crystalline.

Very slight  
Rock generally fresh, joints stained, some joints may show thin clay coatings, crystals in broken face show bright. Rock rings under hammer if crystalline.

Slight  
Rock generally fresh, joints stained, and discoloration extends into rock up to 1 in. Joints may contain clay. In granitoid rocks some occasional feldspar crystals are dull and discolored. Crystalline rocks ring under hammer.

Moderate  
Significant portions of rock show discoloration and weathering effects. In granitoid rocks, most feldspars are dull and discolored; some show clayey. Rock has dull sound under hammer and shows significant loss of strength as compared with fresh rock.

Moderately severe  
All rock except quartz discolored or stained. In granitoid rocks, all feldspars dull and discolored and majority show kaolinization. Rock shows severe loss of strength and can be excavated with geologist’s pick.

Severe  
All rock except quartz discolored or stained. Rock “fabric” clear and evident, but reduced in strength to strong soil. In granitoid rocks, all feldspars kaolinized to some extent. Some fragments of strong rock usually left.

Very severe  
All rock except quartz discolored or stained. Rock “fabric” discernible, but mass effectively reduced to “soil” with only fragments of strong rock remaining.

Complete  
Rock reduced to “soil”. Rock “fabric” not discernible or discernible only in small, scattered locations. Quartz may be present as dikes or stringers.

HARDNESS (for engineering description of rock – not to be confused with Moh’s scale for minerals)

Very hard  
Cannot be scratched with knife or sharp pick. Breaking of hand specimens requires several hard blows of geologist’s pick.

Hard  
Can be scratched with knife or pick only with difficulty. Hard blow of hammer required to detach hand specimen.

Moderately hard  
Can be scratched with knife or pick. Gouges or grooves to 1/4 in. deep can be excavated by hard blow of point of a geologist’s pick. Hand specimens can be detached by moderate blow.

Medium  
Can be grooved or gouged 1/16 in. deep by firm pressure on knife or pick point. Can be excavated in small chips to pieces about 1-in. maximum size by hard blows of the point of a geologist’s pick.

Soft  
Can be gouged or grooved readily with knife or pick point. Can be excavated in chips to pieces several inches in size by moderate blows of a pick point. Small thin pieces can be broken by finger pressure.

Very soft  
Can be carved with knife. Can be excavated readily with point of pick. Pieces 1-in. or more in thickness can be broken with finger pressure. Can be scratched readily by fingernail.

### Joint, Bedding, and Foliation Spacing in Rock

<table>
<thead>
<tr>
<th>Spacing</th>
<th>Joints</th>
<th>Bedding/Foliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 2 in.</td>
<td>Very close</td>
<td>Very thin</td>
</tr>
<tr>
<td>2 in. – 1 ft.</td>
<td>Close</td>
<td>Thin</td>
</tr>
<tr>
<td>1 ft. – 3 ft.</td>
<td>Moderately close</td>
<td>Medium</td>
</tr>
<tr>
<td>3 ft. – 10 ft.</td>
<td>Wide</td>
<td>Thick</td>
</tr>
<tr>
<td>More than 10 ft.</td>
<td>Very wide</td>
<td>Very thick</td>
</tr>
</tbody>
</table>

a. Spacing refers to the distance normal to the planes, of the described feature, which are parallel to each other or nearly so.

### Rock Quality Designator (RQD) a

<table>
<thead>
<tr>
<th>RQD, as a percentage</th>
<th>Diagnostic description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exceeding 90</td>
<td>Excellent</td>
</tr>
<tr>
<td>90 – 75</td>
<td>Good</td>
</tr>
<tr>
<td>75 – 50</td>
<td>Fair</td>
</tr>
<tr>
<td>50 – 25</td>
<td>Poor</td>
</tr>
<tr>
<td>Less than 25</td>
<td>Very poor</td>
</tr>
</tbody>
</table>

a. RQD (given as a percentage) = length of core in pieces 4 in. and longer/length of run.

### Joint Openness Descriptors

<table>
<thead>
<tr>
<th>Openness</th>
<th>Descriptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Visible Separation</td>
<td>Tight</td>
</tr>
<tr>
<td>Less than 1/32 in.</td>
<td>Slightly Open</td>
</tr>
<tr>
<td>1/32 to 1/8 in.</td>
<td>Moderately Open</td>
</tr>
<tr>
<td>1/8 to 3/8 in.</td>
<td>Open</td>
</tr>
<tr>
<td>3/8 in. to 0.1 ft.</td>
<td>Moderately Wide</td>
</tr>
<tr>
<td>Greater than 0.1 ft.</td>
<td>Wide</td>
</tr>
</tbody>
</table>

References:  
Exhibit C-3
ATTACHMENT H

WOOD IDENTIFICATION AND CONSULTATION SERVICES
WOOD SURVEY
Report:

Structural and Architectural Materials Assessment for 241 Dubois St., Black Hawk, Gilpin County, Colorado

Submitted to:

The City of Black Hawk
211 Church Street
Black Hawk, CO 80422

Submitted by:

Kimberly Dugan
Wood Identification and Consultation Services
P.O. Box 550
Lafayette, Colorado 80026

September 12, 2016
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<th>Page</th>
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</tr>
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<td><strong>SCOPE OF WORK</strong></td>
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<tr>
<td><strong>FIELD PROCEDURES</strong></td>
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<tr>
<td>Visual Inspection</td>
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<td>Species Identification</td>
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<td>Historical Research</td>
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<td><strong>FINDINGS</strong></td>
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<td>Nomenclature</td>
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<td>General Construction - Structural Wood Elements</td>
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<td>Framing - Main Building</td>
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<td>Framing - Outbuildings</td>
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<td>Species Identification</td>
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<td>Moisture Content</td>
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<td>Age of the Structural and Architectural Wood Elements</td>
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<tr>
<td>Exterior Siding and Trim - Main Building</td>
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<tr>
<td>Windows - Main Building</td>
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</tr>
<tr>
<td>Exterior Doors - Main Building</td>
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Structural and Architectural Materials Assessment for 241 Dubois St., Black Hawk, Gilpin County, Colorado

BACKGROUND

Kimberly Dugan of Wood Identification and Consultation Services (WICS) was asked to conduct a structural and architectural materials assessment of the building (the Building), located at 241 Dubois St., Black Hawk, Colorado. The purpose of the investigation was to determine the construction history and the approximate age of alterations to the building, which is located within a National Historic Landmark district. The period of significance for the district has been identified as 1859 - 1918.

SCOPE OF WORK

There were questions regarding the construction history and age of the Building and two associated outbuildings, as well as the condition of the structural and architectural wood elements. The completed scope of work and this report provides information on the approximate age and construction history of the three buildings based on an examination of the structural wood and architectural components and associated metal fasteners and hardware.

The scope of work included the following tasks:

- Conducting a site visit to photograph and document existing conditions, followed with an assessment report.
- Conducting a condition investigation, including moisture content measurements to determine whether conditions exist that are favorable to the growth of wood decay fungi and to identify areas of moisture intrusion.
- Examining accessible roof and floor framing to determine dimensions, spacing, and fastener type as well as to identify evidence of alterations or indicators of age.
- Examining exterior architectural wood elements such as window sashes, siding, and trim to determine fastener type and identify evidence of alterations or indicators of age.
- Examining structural wall framing (through probes) in areas of interest as determined by the architect.
- Removing a minimum of 8 wood species samples to identify the wood species or wood species groups for structural and architectural elements of interest.
FIELD PROCEDURES

Ms. Dugan conducted the investigation of the structural and architectural materials of the Building on August 20, 2016. The investigation was based on a combination of visual inspection, moisture content measurement, species identification, and historical research. These methods are described below.

Visual Inspection

Visual examination of the structural and architectural elements of the Building allows for identifying components that are incongruous with surrounding material and that may be indicative of an alteration or repair. Identifying structural member dimensions, spacing, and the types of fasteners used can also provide information on the construction sequence and approximate age of the materials.

Species Identification

The Building is primarily a wood frame structure with wood siding and trim. Identifying wood species can aid in interpretation of historic construction or repair campaigns. Wood species were identified by removing small samples from which the species or species group was identified under microscopic examination. Nineteen samples were removed to identify species of key architectural and structural wood elements to aid in developing historical documentation.

Moisture Content Measurements

Prolonged exposure to moisture can produce undesirable conditions and long-term maintenance issues for wood in a structure. Excessive shrinkage or swelling, checking, loose connections, and decay are typical problems. Limited moisture diagnostics were conducted to determine whether further investigation to identify any sources of moisture causing decay was warranted.

Moisture content measurements identify wood with favorable moisture levels for the growth of wood-decay fungi. Generally, if the moisture content is less than 20 percent wood-decay fungi are unable to grow. While fungi may be present at lower moisture contents they are unable to continue to deteriorate the wood without sufficient moisture. Moisture contents from 20 to 30 percent indicate areas of concern where sufficient moisture is present for fungi to grow but not sufficient to indicate advanced decay. Moisture contents above 30 percent indicate that the wood has reached fiber saturation point (FSP), and, if exposure has been prolonged, is generally an indication of advanced decay with internal voids and/or surface deterioration.

Historical Research

Other materials may be present that can help to determine the age of modifications and the construction sequence of the Building. Material with stamps, maker’s marks, logos, or other identifying components can be researched to find date ranges for production and/or distribution.
FINDINGS

Nomenclature

The Building has been modified significantly since its original construction, ca. 1865. In its current configuration, the Building has an irregular “L-shaped” footprint and is oriented on an approximate east-west axis. There have been multiple additions; the existing additions are shown in Figure 1 below. See Figure A-1 in Appendix A for probe locations.

Figure 1. Existing Building and Additions: 1) original 1-1/2 story building (blue), 2) two-story living room and upper level bedroom + loft addition (green), 3) alteration of half-story to full story second level bedroom (purple), 4) bay window addition (pink), 5) bathroom addition (turquoise), 6) kitchen addition (orange), 7) nook and family room addition (yellow), and 8) upper level modern addition (red). Not to scale.
Based on historical photographs:

- The original structure was a 1-1/2 story gable end wood frame house that underwent at least eight alterations and/or additions since its construction ca. 1865 (Existing Building 1 in Figure 1).
- Between 1878 and 1885, a 2-story front gable wing was added to the west side of the original structure (Addition 2 in Figure 1).
- By ca. 1900, the 1-1/2 story portion of the original structure was converted into two full stories (Alteration 3 in Figure 1). The bay window and a series of two or three small one-story additions to the north and east followed through the early 20th century (Additions 4, 5, 6, and 7 in Figure 1).
- In 1996, a second-story addition was added to the north side of the house (Addition 8 in Figure 1), and the single-story additions were reconstructed, leaving the Building in its current configuration (Figure 2). See Appendix B for historical photographs and a timeline.

![Figure 2. South elevation of the Building.](image)

For ease of reference, the alterations and additions will be referred to by the numerical identifiers provided in Figure 1 throughout this report. These additions refer to the existing configuration of the Building; the locations and dimensions of Additions 5, 6, and 7 have changed since the date of original construction.

Three outbuildings were also included in the scope of work: a carport, a utility shed, and an outhouse. The outhouse is a small front gable building clad with horizontal wood siding (Figure 3). The utility shed has stone walls on the north, east, and west elevations and a shed roof that slopes to the south. The south wall is framed with rough-sawn, full dimension 2 x 4s, and the building is sided with plywood (Figure 4). The carport has a shed roof that slopes to the south, a single lite plexiglass window, and has horizontal plank sheathing and horizontal siding (Figure 5).
Figure 3. North and east elevations of the outhouse.

Figure 4. South elevation of the utility shed.

Figure 5. South elevation of the carport.
General Construction – Structural Wood Elements

Framing - Main Building

The roof framing was only accessible for Addition 2; in this location, the roof framing consists of full dimension 2 x 4 rafters toenailed to a center ridge board (Figure 6). The ceiling joists act as ties for the rafters. All lumber is rough sawn with predominantly circular saw marks. Visible fasteners include both round wire nails and square cut nails. The majority of members are full dimension or near-full dimension members. The quality of the wood is consistent throughout the entire length of the attic. There are a few areas of moisture staining and areas with visible recent repairs, such as around the chimney, but overall the roof framing appears to be in good condition.

Figure 6. Attic framing in the north-south two-story addition; view to the north.

The structural wood wall framing, as determined from probes on the interior, differs by location/addition. On the west and south walls in the locations of the probes (Addition 2 and Alteration 3), the wall framing is rough-sawn full dimension 2 x 4s. Fasteners are cut nails. In the west wall probe in addition 2, the wall studs are spaced 16 inches on center and there is mineral wool insulation and plaster and lath on the interior face (Figure 7). In the Alteration 3 south wall probe (second story bedroom), the wall studs are spaced 24 inches on center and there is modern fiberglass insulation and modern gypsum board (Figure 8).
Figure 7. Addition 2 west wall probe in family room showing stud spacing, plaster and lath, and mineral wool insulation.

Figure 8. Probe in Alteration 3, south wall, second story, showing modern gypsum wall board, fiberglass insulation, and the inside face of the exterior siding.

In two additional probes, one in Addition 5, the west wall of the main-level bathroom, and one in Addition 7, the north interior wall of the nook/family room, modern, surfaced, dimension lumber was used, along with gypsum board and fiberglass insulation (Figures 9 and 10).
Figure 9. The structural wall framing of Addition 5, the main level bathroom, west wall, with modern dimension lumber.

Figure 10. Modern dimension wall framing with evidence of moisture intrusion and remnants of fiberglass insulation on the north wall probe, Addition 7, nook/family room.

The only probe to access the floor framing of the Building was in Addition 2 in the living room. There is no crawl space; the rough-sawn full dimension 2 x 6 floor joists are spaced 16 inches on center, and at least in the area of the probe, rest on rock fragments with no air space beneath the joists (Figure 11). Both floor joists within the probe opening have visible evidence of wood decay as evidenced by the cubical cracking seen on the wide faces (Figure 12). Four-inch wide, 3/4-inch tongue and groove planks are fastened to the joists with square cut nails. Floor framing through the rest of the Building could not be determined at the time of the investigation. For additional information on systems or materials with deterioration, see Appendix B.
Figure 11. Probe in Addition 2, living room floor showing the rock fragments and the top of an exposed joist.

Figure 12. Cubical cracking on the face of a floor joist, indicative of wood decay.

Framing - Outbuildings

The utility shed roof framing is modern dimension 2 x 4 lumber with particle board sheathing (Figure 13). Three walls are stone; the south wall is framed with full dimension rough sawn 2 x 4s and horizontal board sheathing (Figure 14). The floor is dry-laid brick. There is a window on the west elevation framed with full dimension boards (Figure 15). Square wrought iron nails were used on the south wall framing members.
Figure 13. Modern roof framing in the utility shed; view to the north.

Figure 14. Full dimension rough sawn wall framing in the utility shed; view to the south.

Figure 15. Window on west wall with full dimension framing members.
The carport framing mirrors the utility shed framing; the roof framing is modern dimension lumber with particleboard sheathing. The west wall framing is also modern dimension lumber with plywood sheathing (Figure 16). The south wall is constructed of rough sawn full dimension 2 x 4s and horizontal plank sheathing (Figure 17). One square wrought iron nail was identified in the wall framing. There is a single lite, fixed plexiglass window on the south wall as well.

Figure 16. Modern roof and west wall framing material within the carport; view to the west.

Figure 17. Full dimension, rough sawn 2 x 4 wall framing with horizontal plank sheathing, south interior wall of carport.

The outhouse roof and wall framing was not visible due to the presence of interior finishes; there is a poured concrete foundation/floor.
**Species Identification**

Twenty-two samples were removed for species identification. Given the assumed construction date of the Building (ca. 1865 - 1872), historic materials such as siding would likely have been produced by local saw mills with locally available material. Trees with native ranges extending into Colorado that were commonly used in early western settlement construction include western yellow pine (a hard pine species group that includes ponderosa pine and lodgepole pine), Engelmann spruce, and Douglas-fir. It should be noted that all of these tree species are still used today for structural and architectural applications, so decisions regarding the age of the wood in a building cannot be based on species alone. A complete list of species identification samples and their locations can be found in Appendix A.

Samples were taken of wall studs, wall sheathing and siding, and floor wearing surfaces, sheathing, and joists, as well as window trim and a porch column. All of the samples were identified either as western yellow pine, Engelmann spruce, or Douglas-fir, except for the historic siding of the outhouse, which was identified as eastern white pine (*Pinus strobus*), which only grows in the eastern half of the U.S. Eastern white pine was commonly used in home-building kits for window sashes, trim, and siding that could be mail-ordered and shipped via railroad, ca. 1890 - 1920.

**Moisture Content**

Moisture content measurements were taken around the perimeter of the home on the lowest exposed trim and siding elements, as well as under windows and along exterior sills. On the interior of the Building, moisture content measurements were taken along window sills and along the north wall sill plate of the nook/family room addition. In all areas except the nook/family room sill plate, the moisture contents were below the 20 percent threshold for active wood decay fungi. The average readings in these locations were between 5 and 10 percent, except for an area on the west elevation near the northwest corner of the Building, Addition 5, where moisture contents were between 12 and 14 percent. Along the north sill plate of Addition 7, moisture contents ranged as high as 34 percent (above fiber saturation point) near the northeast end of the wall.

**Age of the Structural and Architectural Wood Elements**

Determining the exact age of the structural and architectural wood elements by visual inspection alone is generally not possible. In conjunction with species identification and historical research and documentation, however, it is sometimes possible to determine the sequence in which materials were added or altered by examining the materials and fasteners in detail.

A key identifier can be the type of fastener used to hold wood members or architectural elements together. Wire nails, in common use today, were not mass produced until the early 1890s. Prior to the development of the wire nail, nails were machine-cut from sheets of metal or made by hand. By 1900, more wire nails were being purchased than...
machine-cut nails, and by 1920, over 90 percent of the nails sold in the U.S. were wire nails.¹

While wire nails have flat, circular heads and round shafts, machine cut nails, which predate wire nails, were typically stamped or cut from a sheet of metal, generally resulting in square or rectangular heads and square shafts. All of the visible fasteners identified on the structural wood components of the Original Building 1, Addition 2, Alteration 3, the south wall of the utility shed, and the south wall of the carport are cut nails. Cut nails were also identified on the siding of the outhouse. Wire nails were found on the exterior siding, Additions 5 and 7, the utility shed roof and the carport roof. Some of the interior baseboard in various locations throughout the Building had nail holes and surface damage indicative of a modern pneumatic nailer.

Window hardware can also potentially be used to determine approximate dates of construction. Historical photos document the changes in the window opening locations and approximate sizes over time, and at least for the south and east elevations of the Building, the current window openings appear to be the same as the window openings present during the period of significance. The windows themselves, however, are all modern replacement windows based on the dual-pane construction and the plastic operating tracks. The only historic glazing identified within the Building is on the east-facing door of Addition 2.

For structural framing elements, dimensions can sometimes give an indication of age. Modern dimension lumber is marketed by nominal size (e.g., 2 x 4s or 2 x 8s), but the actual size of the lumber is smaller, due in part to surfacing of the wood. Rough-sawn lumber, or lumber that has no surface finish, often varies in width and thickness. Sawmills began to use planers ca. 1870 to size rough-sawn lumber into more uniform dimensions before shipping, and modern lumber is surfaced on all four sides. National lumber size standards did not exist until 1924.² In 1900, the most common thickness for joists, rafters, and wall studs was 2 (actual) inches; modern lumber joists, rafters, and studs are typically 1 ½ inches in thickness, and are surfaced (planed) on all sides rather than rough-sawn.

Measurement of the accessible roof, wall, and floor framing studs in the Addition 2 attic space as well as in probes within Addition 2 and Alteration 3 shows a range of widths and thicknesses in the rough sawn lumber, which indicates the lumber was milled prior to the 1924 national size standard. Modern dimension lumber was identified in the probes within Addition 5 and Addition 7.


Exterior Siding and Trim - Main Building

The Building has horizontal tongue and groove board siding with decorative corner trim. The wood siding has been profiled to simulate brick, and the decorative corner trim is emulative of masonry construction. This style of trim is consistent with the historic time period of significance; however, based on historical photographs, it does not appear to be the original siding, but may be more than 50 years old.

The siding on the west and south elevations of the Building, excluding Addition 7 to the northeast and Addition 8 to the north, appears to have been installed at the same time and fastened with round wire nails. Additions 7 and 8 have siding that was installed following the construction in 1996 that matches the existing siding on the rest of the Building (Figure 18).

![West elevation siding showing the newer siding of Addition 8 (the 1996 second-story addition) and the older siding on Addition 2 (the ca. 1878 - 1885 front gable wing).](image)

Figure 18. West elevation siding showing the newer siding of Addition 8 (the 1996 second-story addition) and the older siding on Addition 2 (the ca. 1878 - 1885 front gable wing).

The exterior window trim differs by elevation, and sometimes by window. On the west elevation, there is a modern double-hung window for the main floor bathroom (Addition 5), and a window with what appears to be historic trim (Addition 2); the historic window trim has a keystone-shaped trim piece on the top of the window while the modern window trim for the bathroom window is simple with mitered corners (Figure 19). On the south elevation of the Building (including Original Building 1 and Addition 2), three windows (two on the main level and one on the second story) have profiled aprons while the remaining windows have simple aprons (Figure 20). Addition 7 to the northeast has simple window trim as well.
Figure 19. West elevation showing the simple modern trim on the bathroom window and the keystone top trim on the main level bedroom window.

Figure 20. Simple window trim on the picture window and a profiled apron on the second story window.

**Exterior Siding and Trim - Outbuildings**

The outhouse has shiplap siding and plain wood trim. The lower 24 to 30 inches of siding on all elevations of the outhouse has been replaced (Figure 21). Fasteners located in the siding above the areas of repair are square cut nails (Figure 22).
Figure 21. West elevation of the outhouse, showing new siding near ground level.

Figure 22. Square cut nail face-nailed into the weathered siding of the outhouse.

The utility shed is sided with modern plywood and has simple wood trim on the south elevation (see Figure 3). Plywood is generally not intended for exterior use. The carport is sided with horizontal wood siding over board sheathing with simple wood trim (see Figure 4).

*Interior Trim - Main Building*

The interior trim of the Building consists of several different profiles. Doors and windows have different trim profiles, and baseboard trim differs by room. Most trim elements have mitered corners. The window, door, and base trim throughout the Building is generally in good condition. Based on the condition of the trim in most locations and the presence of
mitered corners (as opposed to butt joints) around windows and doorways, all of the window and door trim and most of the baseboard trim appears to be replacement material that does not date to the the period of significance and likely dates to a modern renovation. There are a few exceptions: one small area of plain baseboard on the south wall of Original Building 1 (Figure 23), the baseboard on the west wall of Original Building 1, and the upstairs bedroom of Addition 2 (Figure 24). The plain baseboard behind the south wall door is in poor condition compared to the trim throughout the rest of the house. The profiled baseboard trim on the west wall of Original Building 1 and in the upstairs bedroom of Addition 2 have two-prong, plastic outlets, ca. 1930s\(^3\), installed, indicating that for those areas, the baseboard has been in place since the 1930s.

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**Figure 23.** Plain baseboard trim behind the front door in the dining room.

**Figure 24.** Profiled baseboard trim with a ca. 1930s outlet in an upstairs bedroom.

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\(^3\) Crist, Paul

Windows - Main Building

All windows except one are double hung, single lite windows. There is one large 32-lite picture window on the south elevation of Addition 2. All windows except the picture window are operable, modern replacement windows installed in existing openings, as evidenced by the dual pane glazing, the plastic operating tracks, and the Phillips screw fasteners (Figure 25). Phillips head screws, invented in the mid-1930s, came into widespread use by the 1950s. Window hardware includes historically sympathetic latches (Figure 26); however, these are modern replacements.

Figure 25. Modern dual pane window with a plastic operating track installed with a Phillips screw, dining room, south wall.

Figure 26. Historically sympathetic window latches with Phillips screws.

4 Soniak, Matt
In historical photographs dating to ca. 1885, the south elevation of Addition 2 had two rectangular windows on the main level, but by ca. 1900, they were replaced by a single lite picture window. The current picture window in the south elevation of Addition 2 is an enlargement of the opening that existed during the period of significance, as evidenced by the visible areas of repair on both the interior and exterior walls (Figure 27). The 32 lites are not consistent with the historic window, which was a single lite.

Figure 27. Visible area of repair on Addition 2 for the installation of a larger window.

Based on historical photographs, the bay window on Original Building 1 was added ca. 1900 - 1920. During the site investigation, it was noted that the floor slopes significantly to the east in the area of the bay window and the window sashes themselves were cut at an angle to accommodate the slope. This slope is also visible from the exterior (Figure 28), which suggests that the floor framing and/or wall framing that attaches the bay window to the house may be deteriorated or in need of reinforcement.

Figure 28. Bay window showing significant slope to the east.
Exterior Doors - Main Building

There are three entryways into the Building on the south elevation: One is the entryway for Original Building 1, one is an east-facing entryway for Addition 2, and one is a south-facing entryway on Addition 7 (there is also a north-facing door on modern Addition 8). The door into Addition 7 is a modern door with dual pane glazing. The door leading to the dining room of Original Building 1 has a knob and key plate that appear to date to the period of significance (Figure 29), but has modern, dual-pane glazing and modern hinges.

![Figure 29. Knob and key plate on south-facing door.](image)

The door facing east that opens into the living room of Addition 2 has had its knob and key plate removed. Additionally, the door has been caulked and painted shut on the interior. The hinges on this door appear to date to the period of significance, and the glazing is a single pane of wavy glass Figures 30 and 31). Wavy glass is indicative of the manufacturing process and is either crown glass or cylinder glass. Crown glass was blown by hand and was generally not produced after 1850 in the U.S. Cylinder glass is typically associated with windows manufactured ca. 1870s to the 1910s. Based on the large size, the wavy glass pane in the east-facing door appears to have been cylinder glass produced via the Lubbers machine ca. 1900.5

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Figure 30. East-facing door, Addition 2; note the distortions in the reflection of the glass.

Figure 31. A door hinge on the east-facing door of Addition 2 that appears to date to the period of significance.

**Interior Doors - Main Building**

Three interior doors remain that appear to be at least 50 years old: the door to the downstairs bedroom of Addition 2, the door to the upstairs bedroom of Addition 2, and the door that leads to the upstairs bedroom of Alteration 3. The doorway into the main-level bedroom of Addition 2 exhibits racking towards the south (Figure 32), and the door itself is cut at an angle in order to close properly, suggesting potential structural issues that should be investigated by a structural engineer.
SUMMARY OF THE WOOD INVESTIGATION

The findings of the wood investigation can be summarized as follows:

The Building

• Based on a limited number of samples removed, the existing structural wood framing of the Building come from trees with native habitats that extend into Colorado and include the Black Hawk area. Although this finding does not rule out the possibility that the timber was shipped in from another geographic region, it is relatively unlikely, given the predominance of these locally available tree species.

  o One exception is the historic siding on the outhouse, which was identified as eastern white pine (Pinus strobus).

• All windows and hardware are modern replacements.

• Of the three historic entries, only the east-facing door of Addition 2 dates to the period of significance; the other two doors are modern replacements.

• The lumber using in the construction of the roof, wall, and floor framing in Original Building 1, Addition 2, and Alteration 3 are rough sawn, full dimension members spaced either 16 or 24 inches on center. Most members have circular saw marks visible on the wide faces. Based on the areas exposed by probes, the quality and appearance of the wood is consistent throughout these portions of the Building. The dimensions vary +/- 1/2 inch or more from standard dimensions. This variance indicates that the lumber within Original Building 1,
Addition 2, and Alteration 3 was milled prior to the standardization of lumber sizes, ca. 1924.

• The lumber used in the construction of Additions 5 and 7, based on probe openings, is modern dimension, surfaced lumber that likely dates to the 1996 addition and reconstruction.

• Metal fasteners used for structural framing within Original Building 1, Addition 2, and Alteration 3 are cut nails. Wire nails were identified on the exterior siding of the Building. Wire nails began to be mass-produced in the late 1880s and rapidly began to take over the market, exceeding sales of cut nails by 1900, and constituting over 90 percent of the nail market by 1920. The presence of wire nails in the siding suggests that the siding for Original Building 1, Addition 2, and Alteration 3 was installed at some point after ca. 1920.

 o Siding on Additions 5 and 7 is modern replacement siding.

• The structural floor framing was only visible in one location in Addition 2. The lack of air space below the joists and the evidence of wood decay indicates that the floor framing may be structurally compromised; additional investigation by a structural engineer is recommended.

• The roof framing of Addition 2 appear to be full dimension 2 x 4s toenailed into a ridgeboard of a non-structural dimension (1-inch thickness). The ability of the roof framing to withstand snow and wind loads should be investigated by a structural engineer.

• Based on the angle of doorways into Addition 2, it appears that the Building may have eccentric loading towards the south that should be investigated by a structural engineer.

• Original Building 1, Addition 2, and Alteration 3 definitively date to the period of significance based on historical photographs and physical evidence of framing members, fasteners, and the presence of plaster and lath and mineral wool insulation in Addition 2.

 o Alteration 3 underwent relatively recent alterations to install gypsum wall board and fiberglass insulation.

 o The date of alteration of the east elevation window in Alteration 3 is unknown; ca. 1920, the window was a small 6-over-6 lite double-hung window. It is currently a double hung window with single-lite sashes.

 o The floor of Alteration 3 exhibits some deflection when walked upon. It is recommended that a structural engineer examine the dimensions and span of the members, as well as the existing connections, to determine their adequacy in supporting existing and anticipated loads.
• Addition 4, the bay window, appears to date to the period of significance; however, the windows are modern replacements and there is evidence of structural compromise based on the significant slope of the floor in that area.

• Based on historical photographs, Additions 5, 6, and 7 have undergone alterations since the Building’s construction.
  o Based on historical photographs, Addition 5 appears to have originally been a stone-walled root cellar or wood shed dating to the period of significance that was framed over and converted into the main level bathroom during the 1996 addition and remodel.
  o The exact extent of Addition 6 could not be determined at the time of the investigation. It appears that the majority of the addition was demolished and reconstructed during the 1996 addition and remodel.
  o Addition 7 appears to have been fully demolished and reconstructed during the 1996 addition and remodel. Alterations include relocating or expanding the addition to the south, new structural framing and insulation, new windows, new doors, and an increase in ceiling/roof height from the original construction.

• Addition 7 shows evidence of moisture intrusion in the form of active water stains on the structural framing (sill plate) and wet carpeting in the northeast corner of the room. Exposure to moisture can lead to deterioration of structural framing members from wood decay fungi. The condition of all framing members along the north wall of the Building should be assessed to determine the need for reinforcement or replacement.

• The Building under investigation qualifies for the Preservation Program, according to the following guidelines:
  - Original Building 1, Addition 2, Alteration 3, and Additions 4, 5, and 6 were constructed during the period of significance of 1859-1918. Addition 7 was constructed more than fifty (50) years prior to the date of the application (2016), however, based on the investigation, it has been completely reconstructed ca, 1996.

**The Outhouse**

• Based on a historical photograph taken in 1910, the roof of the outhouse is visible (see Appendix B), albeit in a different location than it is currently.

• Based on species identification and investigation of the existing siding metal fasteners, which are square cut nails, it appears that the outhouse dates to the period of significance; replacement siding (on the lower 30 inches of all elevations) and new roofing materials have recently been installed.
• The orientation and location of the outhouse has changed since the period of significance, and it now rests on a modern poured concrete pad.

• **The outhouse under investigation qualifies for the Preservation Program, according to the following guidelines:**
  
  - The outhouse was constructed during the period of significance of 1859-1918.

**The Utility Shed**

• The three stone walls and west-facing window opening of the utility shed are most likely the remnants of a root cellar or wood shed of the house immediately to the west of the Building (see Appendix B), similar to the original stone wall construction of Addition 5. The neighboring residence existed as early as 1878 and was demolished at some point prior to 1971, indicating that the stone walls most likely date to the period of significance.

• The south wall wood framing is rough-sawn, full-dimension lumber with horizontal board sheathing made from locally available tree species and cut nail fasteners, indicating that the south wall dates to the period of significance. It may be the remains of a wall from the residence, or it may be constructed of recycled lumber and fasteners.

• The roof framing of the utility shed is constructed of modern materials and likely dates to ca. 1970 - 1996.

• **The utility shed under investigation qualifies for the Preservation Program, according to the following guidelines:**
  
  - The three stone walls and the wall framing and horizontal board sheathing were constructed during the period of significance of 1859-1918.

**The Carport**

• The carport does not appear in historical photographs until 1996.

• The roof framing and western wall framing is constructed of modern dimension lumber and particle board sheathing, indicating that the roof and western wall are not 50 years old.

• The fixed window is made of acrylic glass. Although acrylic glass was first marketed in the 1930s, it is an atypical glazing material that can experience significant degradation through exposure to ultraviolet light, making it unlikely to be over 50 years old.
• The wall framing of the south wall is comprised of rough-sawn, full-dimension lumber with horizontal board sheathing made from locally available tree species and cut nail fasteners, indicating that the south wall dates to the period of significance. Given that the rest of the carport is constructed of modern materials, it may be that the west wall framing and board sheathing are the remains of a wall recycled from another outbuilding, or the wall may have been constructed of recycled lumber and fasteners.

• **The carport under investigation does not qualify for the Preservation Program.** Although the south wall framing likely dates to the period of significance, the rest of the structure is constructed of modern materials and there is no evidence of the building in historic photographs.
APPENDIX A

Plan Drawing with Probe Locations

Species Identification Table

Architectural and/or Historical Feature Table
Figure A-1. Plan view showing probe locations (blue). Drawing courtesy of Scott McClelland.
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<thead>
<tr>
<th>Sample No.</th>
<th>Member</th>
<th>Location</th>
<th>Dimensions</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>T&amp;G flooring</td>
<td>from living room probe</td>
<td>5&quot; width</td>
<td>western yellow pine (Pinus spp.)</td>
</tr>
<tr>
<td>2</td>
<td>floor joist</td>
<td>living room probe</td>
<td></td>
<td>western yellow pine</td>
</tr>
<tr>
<td>3</td>
<td>wall stud</td>
<td>west wall of living room</td>
<td>2 x 4</td>
<td>western yellow pine</td>
</tr>
<tr>
<td>4</td>
<td>T&amp;G flooring</td>
<td>dining room</td>
<td>6&quot; width</td>
<td>western yellow pine</td>
</tr>
<tr>
<td>5</td>
<td>lath</td>
<td>west wall of living room</td>
<td></td>
<td>western yellow pine</td>
</tr>
<tr>
<td>6</td>
<td>wall stud</td>
<td>nook</td>
<td>1 5/8 x 3 1/2</td>
<td>western yellow pine</td>
</tr>
<tr>
<td>7</td>
<td>center column</td>
<td>front porch</td>
<td></td>
<td>western yellow pine</td>
</tr>
<tr>
<td>8</td>
<td>T&amp;G decking</td>
<td>front porch</td>
<td>3/4 x 3</td>
<td>Douglas-fir (Pseudotsuga menziesii)</td>
</tr>
<tr>
<td>9</td>
<td>siding</td>
<td>west elevation</td>
<td></td>
<td>western yellow pine</td>
</tr>
<tr>
<td>10</td>
<td>siding</td>
<td>east elevation</td>
<td></td>
<td>western yellow pine</td>
</tr>
<tr>
<td>11</td>
<td>siding</td>
<td>south elevation of addition</td>
<td></td>
<td>western yellow pine</td>
</tr>
<tr>
<td>12</td>
<td>wall stud</td>
<td>probe in upper bedroom, south elevation</td>
<td>2 1/16 x 4</td>
<td>Engelmann spruce (Picea engelmannii)</td>
</tr>
<tr>
<td>13</td>
<td>siding</td>
<td>south elevation</td>
<td></td>
<td>Engelmann spruce</td>
</tr>
<tr>
<td>14</td>
<td>window trim</td>
<td>above west elevation window</td>
<td></td>
<td>western yellow pine</td>
</tr>
<tr>
<td>15</td>
<td>wall stud</td>
<td>shed wall, south elevation</td>
<td>1 7/8 x 4</td>
<td>western yellow pine</td>
</tr>
<tr>
<td>16</td>
<td>siding</td>
<td>weathered siding on outhouse</td>
<td></td>
<td>eastern white pine (Pinus strobus)</td>
</tr>
<tr>
<td>17</td>
<td>siding</td>
<td>replacement siding on outhouse</td>
<td></td>
<td>western yellow pine</td>
</tr>
<tr>
<td>18</td>
<td>wall stud</td>
<td>carport, south elevation</td>
<td>1 7/8 x 4</td>
<td>Douglas-fir</td>
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<tr>
<td>19</td>
<td>plank siding</td>
<td>carport interior</td>
<td>1 x 13 1/2</td>
<td>Engelmann spruce</td>
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Table A-2. Architectural and/or Historical Features

<table>
<thead>
<tr>
<th></th>
<th>Are original (to the construction date ca. 1865 - 1885)?</th>
<th>Date to the period of significance (1859 - 1918)?</th>
<th>Are greater than 50 years old?</th>
<th>Reflect the original design intent for the building?</th>
<th>Reflect period or regional styles or building practices?</th>
<th>Reflect changes to the building from major periods or events?</th>
<th>Are examples of exceptional craftsmanship or design?</th>
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<tr>
<td><strong>Main Building</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doors</td>
<td>No</td>
<td>Yes - East-facing door on south elevation</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Windows</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes - except for the 32-lite picture window</td>
<td>Yes</td>
<td>No</td>
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</tr>
<tr>
<td>Siding</td>
<td>No</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Carport</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Windows</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Siding</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Outhouse</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Door</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Siding</td>
<td>No</td>
<td>Yes - portions that were not replaced</td>
<td>Yes - portions that were not replaced</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Utility Shed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Windows</td>
<td>Yes - window opening</td>
<td>Yes - window opening</td>
<td>Yes - window opening</td>
<td>Partially</td>
<td>Partially</td>
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<td>No</td>
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<td>Siding</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
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</tr>
</tbody>
</table>
APPENDIX B

Discussion of Physical Evaluation (Doors/Windows)

Discussion of Main Building, Outbuildings, Alterations/Additions
Physical Evaluation (Doors/Windows) - Main Building

1. Condition of the paint - the paint on most windows and doors is in fair to good condition. The paint on windows that are not protected by an overhang exhibits minor to significant cracking on horizontal surfaces.

2. Condition of the frame and sill - all window sills and frames are in good condition, with the exception of the sill on the main level bedroom window, Addition 2, west elevation. The sill has a visible repair and significantly cracked paint.

3. Condition of the sash (rails, stiles and muntins) - all rails and styles are in good condition. There are no muntins other than the modern grill that forms the faux lites of the picture window, Addition 2.

4. Glazing problems - none were apparent at the time of the investigation.

5. Hardware - historically sympathetic, where present, except for the main level bedroom window (Addition 2).

6. The overall condition of the window (excellent, fair, poor, and so forth) - all windows are in good condition.

7. The pattern of the openings and their size - the pattern of the openings appears to be consistent with those visible in historical photographs on the east and south elevations. The two exceptions are the picture window (Addition 2), and the east-facing window of Alteration 3.
   A. The picture window appears to be slightly wider than what was historically present and there is evidence of alterations to the interior and exterior finishes on each side of the window. The picture window opening as it currently exists measures 70-1/4" x 83-1/4".
   B. The east-facing window of Alteration 3 was once a 6-over-6 double hung window. It is not known when it was changed to its current configuration. The window sashes measure 21” x 31”, with an overall opening of approximately 21” x 62”.

8. Proportions of the frame and sash - since all windows are modern replacements, the proportions of the frame and sash were determined to have no historical significance.

9. Configuration of window panes - the window panes are all single-lite except for the faux 32-lite picture window.

10. Muntin profiles - the only munitions are on the grill of the faux 32-lite picture window, since it is a modern replacement window, the muntin profile is of no historical significance.

11. Type of wood - exterior window trim elements were identified as western yellow pine (Pinus spp.). Interior trim and sashes were determined to be modern replacement material and were not sampled for species identification.

12. Paint color - exterior trim is purple; interior trim is white in most locations. The trim within the small hallway and up the stairway is mauve.

13. Characteristics of the glass - all glass with the exception of the east-facing door (Addition 2) is modern replacement material.
14. Associated details such as arched tops, hoods, or other decorative elements - there is a keystone-shaped top window trim on the exterior wall of the main level bedroom (Addition 2). The trim on other windows is generally simple, with profiled aprons on two windows on the south elevation (the upper level bedroom, Addition 2, and the dining room, Original Building 1).

Main structure, outbuildings, alterations/additions:

1. Does the building represent a variety of periods of construction, additions, and modifications, not all of which may be significant?

All of the buildings represent a variety of periods of construction and modifications. For the Building, Additions 6, 7, and 8 represent modifications that have significantly altered the historic fabric, if not removed it entirely. Addition 5 still has the stone wall on the west elevation, although it is hidden behind modern framing and gypsum wall board. The extent of the stone wall that remains is unknown.

The south wall of the carport, the outhouse (in its entirety), and the stone walls and south wall of the utility shed appear to date to the period of significance.

2. Does the building have physical problems that require repair?

Main Building - There are several areas of concern within the Building. The dimensions and connections of the roof rafters and ridge board should be assessed by a structural engineer to determine the roof framing's adequacy to support existing and anticipated loads. The floor framing and connections of Alteration 3 should be assessed, as it exhibits some deflection when walked upon. The floor framing visible in the Addition 2 probe shows signs of deterioration by wood decay fungi. Addition 2 overall appears to be racked towards the south, and the bay window (Addition 4) slopes significantly. In Addition 5, there is a large cavity created by the wall framing added in 1996 that is full of rodent droppings. In Addition 7, moisture intrusion along the north wall needs to be mitigated in order to prevent mold growth and deterioration of structural framing members.

Carport - The roof joists have deflected and appear to be overloaded.

Outhouse - The outhouse is in generally good condition.

Utility Shed - The roof framing of the shed has deflected and there are areas of significant moisture staining and deterioration.

3. What construction materials and systems are known to exhibit distress or deterioration?

Main Building - In addition to those systems identified in response to question 2, the exterior siding on the east elevation of the Original Building 1, the south and west elevations of Addition 2, and the south and east elevations of Alteration 3 exhibits moderate to severe weathering. Within the transition from the upper level of Addition 2 to Alteration 3, there is evidence of moisture intrusion that has damaged the wall covering; this appears to be old damage (from prior to the installation of the metal roof), however, structural framing members in this location may be deteriorated.
Outbuildings - see responses to question 2 above.

4. Does the building have code or functional problems that interfere with its use?

Main Building - A thorough building inspection is recommended to identify all potential issues. Possible code issues that were noted include stairs with treads that are too narrow, a lack of a sufficiently-sized landing at the base of the stairs, ungrounded electrical outlets, multiple radiant heating elements, lack of adequate attic access, and lack of a crawl space or crawl space access.

Outbuildings - the overstressed roof framing members of the utility shed and the carport indicate those structures are at risk of collapse.

5. Is the building in use?

All buildings are in use.

6. Is a new or more intensive use planned?

This investigator is unaware of any new or more intensive use planned for the Building or its associated outbuildings.
APPENDIX C

241 Dubois: Research on Construction History
241 Dubois
Research on construction history

SUMMARY

Documented as historic:
- 1st & 2nd stories – blue box
- 1st story only – purple box
- 1st story only (originally historic, but reconstructed in 1996 & moved south) – orange box

Lacking documentation as historic:
- Red boxes

Non-historic:
- Doll house (not shown)
Sources & notes

Between 1865 & 1872. The present house is not visible. A smaller building may be on the lot, or the side gable wing may be present (in this photo, it is 1 ½ stories) and thus could be the oldest portion of the house. The height of the structure, proportions, and locations of the openings are consistent with the 1 1/2 story portion visible in DPL: X-2072.

Between 1878 & 1885. The house is L-shaped, with a two-story front gable wing, and a 1 ½-story side gable wing. Due to angle of photograph, it is uncertain which outbuildings are associated with 241 Dubois. Two possibilities: A) a fenced back yard with two small sheds on either side of the fence; or B) a small gable roof shed with a rear shed-roof addition.
**Between 1900 & 1920?** The side gable wing is now 2-story, and has a three-sided bay window added on the east. Fenced rear yard is now dilapidated in “A,” while “B” is missing the rear shed-roof addition. Outbuilding “C” is now present (not built in the previous photograph). Note that the east-facing window of Alteration 3 is a small, 6-over-6 double-hung window. The size is consistent with a window for an attic or half-story space.
DPL; L-592, taken between 1899 and 1910 showing the fenced yard and a front gable outbuilding.
1910. A different shed (D) is visible behind the house; this outbuilding has a side gable roof, and is taller than those visible in the previous photographs. This may be the same outbuilding that is shown in L-592.

Note the close proximity of the residence directly to the west of the Building; the spacing appears to match that of the eastern stone wall of the utility shed and the west elevation of the Building. The roof of the outhouse appears to be visible, and there are some white areas to the east of the Building that are consistent with the historic addition shown in the undated photograph DPL: X-2047.
Between 1890 & 1920. Small one-story shed-roof addition on the rear of the house is barely visible. Due to the presence of a neighboring house on the east, it is unlikely that there was an addition extending easterly into the side yard. The neighboring house to the east is the same house that exists today, and there is considerable space between the structures; enough so that the building currently has an addition projecting to the east and the neighboring house has an addition projecting to the west. A historic addition to the east was therefore possible at the time of this photograph.
ca. 1971. A new small shed is visible at the rear. The small shed appears to be the outhouse, which is visible in other historical photographs dating back to as early as 1910.

Undated historic photograph (likely early 20th century due to presence of electrical poles).

Addition “B” on east side of building is visible, and is therefore over 50 years old. Outhouse is also present.
Views of west elevation. Note the small stone room built into the hillside at the rear, and lack of second story above the stone room. The first level of the northwest corner of the building is thus historic, but the second story (not shown in this photo) is not historic.
Gilpin County Assessor’s cards, January 1972.
The following additions and outbuildings were shown on an undated map.
a) one story rear addition
b) carport (11’ x 16’)
c) shed (8’ x 16’)

However, in 1974, the assessor provided a total square footage of structures on the property. This did not include the utility shed, thus indicating that the utility shed was added to the map later (and therefore, the shed was built after 1974).

Square footage in 1974:
1212 sq. ft. on first floor
684 sq. ft. on second floor
1896 total sq. ft. residence
392 sq. ft. in porches
176 sq. ft. carport

Gilpin County Assessor’s office.
Undated Gilpin County Assessor’s map. This map indicates that the one-story rear addition was likely built in separate stages, with a small 6’ x 18’ section constructed first. This is corroborated by the DPL photo X-2078.
1986. Note: outhouse (E) at rear of property. Rear addition (A) and side rear addition (B) are visible, with addition (A) likely being the oldest addition. Both additions are one-story. Addition (B) was built after the house on the east was demolished. The house to the east is the same house as the one in historical photographs. Addition B shown here, existed from ca. 1910 to 1996. Alterations in 1996 appear to have demolished the historic addition and replaced it with a slightly wider and significantly taller construction (Addition 7 in the report).
December 3, 1996. A second story is under construction, above the rear addition (A). Carport is visible. Note the change in height of the roofline to Addition 7 and the removal of the east-facing window of Addition A (Addition 6 in the report).
Current Gilpin County Assessor information.

Square footage:
2112 sq. ft. heated (compared to 1896 sq. ft. in 1972)
2137 effective sq. ft.
2375 actual sq. ft.
2nd story of rear addition (C) – built ca. 1996
Shed (F) – built after 1974. The three stone walls of the utility shed and the southern wall framing and horizontal board sheathing may be remnants of the demolished house that once was directly to the west of the Building.
SUMMARY

Various historic outbuildings were present through the years; none appear to remain except for outhouse.

* **Ca. 1865.** Original structure, 1 1/2 story, side gable.
* **Ca. 1878.** Addition to create an L-shaped building, with a 2-story gable-front wing, and a 1 1/2-story side gable wing.
* **Ca. 1890 - 1910.** Side gable is now 2-stories, with a bay window on the first floor.
* **By 1920:** Small rear addition w/shed roof (pg. 3). Also, it is likely the small stone wall addition exists by this point.
* **By 1972:** Rear addition, 12’ x 44’, one-story. This addition was present in an undated historical photograph that is more than 50 years old based on the presence of utility poles; additionally, there is evidence of the addition in a photograph that dates to 1910.
  
  Carport, 11’ x 16’.
  Residence: 1896 sq. ft.
* **After 1974:** Utility shed, 16’ x 8’. The stone walls and south wall framing and sheathing of the utility shed were likely in existence during the period of significance.
* **1996:** Second story added to rear; east addition moved forward from original location or widened slightly. The wood framing visible in the probe area is modern dimension lumber, so it appears that the east addition was completely reconstructed in 1996.
* **Current:** Residence: 2375 sq. ft.
ATTACHMENT I

GLOSSARY
Attachment I

GLOSSARY

As-Built: Architectural plans that show the existing conditions of a building.

Ashlar: Stone masonry pattern of rectangular stones set without continuous joints and appear to follow a random pattern, although a large pattern may be repeated.

Chamfered: A chamfer is a transitional edge between two faces of an object.

Cladding: Window cladding looks very similar to the frame and sits around the perimeter of a window. It is sealed to the glass with a sealant, such as silicone, and is designed to direct water away from any of the underlying wood of the window frame, which ultimately prevents rotting.

Contributing: Contributing shall refer to any resource located within an identified historic District that represents that period and area of significance associated with that geographic area.
Corner boards  Board placed at the corners of exterior walls to provide a neater appearance and to protect the ends of the wood siding.

Course  A horizontal row of bricks, stone, or other masonry units.

Cut nails  Cut nails, were cut from iron plates, has a rectangular shank that tapers only on the two opposing sides. The early cut nails were "Headed" by hammering.

Dormer  A dormer is a roofed structure, often containing a window, that projects vertically beyond the plane of a pitched roof.
Dry stack  *(also: dry masonry, dry stone, dry wall, dry rubble construction)* Masonry work laid without mortar. A self-supporting rubble or ashlar wall built without mortar.

Ell  An extension or wing of a building that is at right angles to the length of the building

Elevation  Any face of a building or side of a room. In a drawing, the same or any part of it, represented in two dimensions. A scale drawing of the upright parts of a structure.

Façade  The principal face or front elevation of a building.

Field stone  Small uncut boulders or large stones used in their natural form for fences, crude walls, and so on.
Fretwork Patterns or decoration on a surface made by cutting into or through the surface

Frieze Any plain or decorative band, or board, on top of a wall immediately below the cornice; sometimes decorated with ornamentation. Porch cornices may likewise be decorated with friezes. A common example, the *spindled porch frieze*, is illustrated.

Gable [also gable end] The triangular end of an exterior wall in a building with a ridged roof

Gable Roof A sloping (ridged) roof that terminates at one or both ends in a gable
**Galvanized** is the process of applying a protective zinc coating to steel or iron, to prevent rusting.

**Glazing** Fitting glass into windows and doors

**Grading** The work of ensuring a level base, or one with a specified slope, for construction work such as a foundation, surface draining, a base course for a road or sidewalk, etc.

**Grille** Grilles were originally used to divide large glass sheets into smaller sections that were easier to manufacture and distribute. However, as technological advancement makes manufacturing large glass sheets and strong window frames a feasible option, the use of grilles has been shifted from utility to aesthetics to still create the divide lite aesthetic. Grilles are also referred to as muntins.

**Half Round Gutter** A channel of wood or metal running along the eaves of a house, used for catching and carrying off rainwater and water from melting snow. **Half round** refers to the shape of the gutter, and is a type that was traditionally found on historic buildings.
**Hip roof**
A roof with an external angle formed by the meeting of two sloping roofs.

![Hip roof diagram](image)

**Jamb**
A side post or surface of a doorway or window.

![Jamb diagram](image)

**Lap siding**
A type of siding that consists of boards that are thicker on one edge than the other; the bottom (thick) edge of one board overlaps the top (thin) edge of the board below.

![Lap siding](image)

**Light**
A fixed pane of glass (see *Windows – parts of*).

**Masonry**
Work constructed by a mason using stone, brick, concrete blocks, or similar materials.
**Molding**  A continuous decorative band; serves as an ornamental device on both the interior and exterior of a building. Often serves the function of obscuring the joint formed when two surfaces meet.

**Mortar**  A mixture of plaster, cement or lime with a fine aggregate and water; used for pointing and bonding bricks or stones.

**Muntin**  One of the thin strips of wood used for holding panes of glass within a window, also referred to as a grille. (see Windows - parts)

**Outfall**  A location where an underground drain system penetrates a wall, allowing the water to flow out. Often the pipe is covered with a rodent screen to protect the system from debris.
**Permeation Grouting**  Soil Permeation Grouting is typically used to reduce soil permeability, improve soil cohesion, improve the structural characteristics of the soil, or, as often the case, a combination of some or all of these goals. It involves the injection of grout at low pressures into the soil matrix in an effort to permeate or encapsulate the individual soil grains without otherwise disturbing the natural state of the soil.

![Permeation Grouting](image)

**Pilaster**  A rectangular column or shallow pier attached to a wall; quite frequently decoratively treated so as to represent a classical column with a base, shaft and capital.

![Pilaster](image)

**Quoins**  Large stone, or rectangular pieces of wood or brick, used to decorate and accentuate the corners of a building; laid in vertical services with, usually, alternately large and small blocks.

![Quoins](image)
Reveal  The portion of a wood element that is fully visible after installation. (example below has a 6” reveal despite being an 8” board)

Rubble  *(also rubblework)* Masonry built of rubble or roughly quarried stones.

Saltbox  A roof characterized by a short slope on one side, and a long slope on the other, which sometimes sweeps close to the ground

Sashes  The framework into which panes are set. (See Window-parts of)
**Sheathing**  The board or panel material used in floor, wall and roof assemblies of construction. One function is to form a surface onto which other materials can be applied.

**Shed roof**  A roof consisting of one inclined plane.

**Sill**  The framing member that forms the lower side of an opening, such as a door sill. A window sill forms the lower, usually projecting lip on the outside face of a window (see Window-parts of).

**Simulated Divided Lights**  One piece of glass with detachable muntins or grilles, attached to both the interior and exterior of the glass.
**Standing Metal Seam**  Standing seam systems are premium metal roofing designed to hide fasteners by using concealed side laps or concealed clips. These can be either snap together systems or mechanically fastened panels.

**Swale**  A low tract of land; the term can refer to a natural landscape feature or a human-created one. Artificial swales are often designed to manage water runoff.

**Tongue & Groove**  A joint composed of a rib (tongue) received by a groove.
**True Divided Lights**

Multiple small panes of glass that are separated by muntins or grilles.

**Veneer**

A decorative layer of brick, wood, or other material used to cover inferior structural material thereby giving an improved appearance at a low cost.

**Window (parts of)**
**Wire nails**  As the name implies, wire nails are formed from wire. Usually coils of wire are drawn through a series of dies to reach a specific diameter, then cut into short rods that are then formed into nails. The nail tip is usually cut by a blade; the head is formed by reshaping the other end of the rod under high pressure,
RESOLUTION 19-2017

A RESOLUTION

APPROVING A JOB

DESCRIPTION FOR A

CIVIL ENGINEER
TITLE: A RESOLUTION APPROVING A JOB DESCRIPTION FOR A CIVIL ENGINEER

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF BLACK HAWK, COLORADO, THAT:

Section 1. The City Council hereby approves the Job Description for Civil Engineer.

RESOLVED AND PASSED this 8th day of March, 2017.

____________________________________________
David D. Spellman, Mayor

ATTEST:

____________________________________________
Melissa A. Greiner, City Clerk
CITY OF BLACK HAWK
REQUEST FOR COUNCIL ACTION

SUBJECT: A resolution approving the job description and associated pay scale for a Civil Engineer II position.

RECOMMENDATION: If City Council chooses to approve Resolution 19-2017, the recommended motion is as follows: "Motion to approve Resolution 19-2017, a Resolution approving a job description for a Civil Engineer."

SUMMARY AND BACKGROUND OF SUBJECT MATTER:
The City has a very ambitious capital improvement program slated for the next several years. The volume of projects exceeds what current staff can accomplish. In addition to managing projects, this position will be expected to assist with some development plan reviews, water projects and management of the water system, and other services as needed. This position was approved under the 2017 budget.

FUNDING SOURCE: 010-3101-431-1201 Reg Salaries/Wages/Full Time

WORKSHOP DATE: February 8, 2017

ORIGINATED BY: Thomas Isbester

STAFF PERSON RESPONSIBLE: Thomas Isbester

PROJECT COMPLETION DATE: N/A

DOCUMENTS ATTACHED: job description

CITY ATTORNEY REVIEW: [ ]Yes [ ]No [ ]N/A INITIALS__________

SUBMITTED BY: 
REVIEWED BY:

Thomas Isbester, Public Works Director 
Jack Lewis, City Manager
CITY OF BLACK HAWK
2016 Job Description

JOB TITLE: Civil Engineer
DEPARTMENT: Public Works

REPORTS TO: Public Works Director
EXEMPT: Yes / At-Will
SALARY RANGE: $66,270 / $86,151 Annual

SUMMARY
This is highly responsible work in planning and coordinating a variety of capital programs/projects in the Public Works and Water Departments. This position includes capital improvement project contract administration and coordination; review of projects related to utility improvements and private developments; and monitoring existing programs and activities related to the Water Operations and Water Resources. Work is reviewed by the Director of Public Works, Senior Civil Engineer and Senior Water Resources Engineer through observation, conferences, reports, and achievement of desired objectives. Prepares written reports and memoranda. Carry out related administrative duties as assigned.

SUPERVISORY RESPONSIBILITIES
• None

ESSENTIAL DUTIES AND RESPONSIBILITIES
• Manage City Projects including design, service and construction contracts for street, infrastructure, preservation, water treatment and distribution, and building projects.
• Schedule and attend regular project meetings
• Review contractor/consultant pay applications and change orders
• Reviews plans, specifications, and contract documents prepared by consulting engineers or private contractors for propriety, adequacy, and accuracy.
• Manage Consultants and assists with the management of feasibility studies, Environmental Impact Statements for water resources, and water treatment projects.
• Helps to develop the Public Works and Water Departments annual and 5-year Capital Improvement Projects budget in cooperation with Department staff.
• Coordinate consultant selection, and write request for proposals, and contract administration. Oversees construction bids, review bids and manages the construction contracts for City.
• Answers inquiries regarding projects and other engineering matters, prepares staff reports, request for Board of Aldermen action memos, and similar periodic reports.
• Design of small projects as may be required and ability to clearly write reports, memoranda, and documents for Board of Aldermen.
• Assist with the development & updates for the water distribution hydraulic model in order to analyze system operation and development updates.
• Coordinate with all utility companies, state agencies, federal agencies, and other City staff, as applicable, on project design and construction issues.
• Respond effectively to inquiries and complaints from the public, contractors, engineers, architects, residents, and property owners regarding project design and construction issues.
• Report regularly to Public Works Director regarding project status, design, and construction issues.
• Review submittals, Right-of-Way and Street Cut permits, and other permits for conformance to City ordinances, and make approvals of same.
• Inspect projects and public improvements for conformance to plans, specifications, and City ordinances.
• Initiate surveys and design meetings for new project concepts.
• Compile information regarding ownership of property easements and right of way.
• Expected to use judgment and initiative in developing work methods.
• Perform other duties as assigned.

OTHER DUTIES AND RESPONSIBILITIES
• May coordinate with water rights consulting engineers for monthly water rights accounting.
• May consults with water rights attorney for water rights legal documents.
• May serve as alternate staff liaison to the Upper Clear Creek Watershed Association and the South Platte Basin Roundtable
• May serve as alternate staff liaison to Clear Creek County for operation and maintenance of the Green Lake Water Storage Project.
• May serve as alternate staff liaison to the Town of Georgetown for operation and maintenance of Georgetown Lake

KNOWLEDGE, SKILLS AND ABILITIES
• Knowledge of utilities and water resources, construction, structure and historic preservation and renovation, capital improvement projects, and operations, principles and practices as related to road construction and maintenance, treatment plants, distribution, field operation activities, and water resources facilities, including hydraulic modeling, storm drainage and floodplain management.
• Ability to conduct and evaluate engineering and technical studies and analysis on various programs to determine recommendations based on the information received.
• Ability to gain a thorough understanding of City codes, ordinances, regulations, and standards governing public utility facilities construction, maintenance, and repair.
• Ability to make public presentations, present ideas, data, and reports clearly and concisely both verbally and in written form.

• Ability to establish and maintain effective working relationships with supervisors, employees, consultants, contractors, State and Federal officials, and other people contacted in the course of a workday.

• Knowledge of the principles and practices of civil engineering as it relates to Public Works and Utilities projects.

• Ability to gain knowledge of water quality concerns as related to municipal Public Works and Utilities operations, including the Safe Drinking Water Act, and its amendments; NEPA. RCRA Super Fund; Clean Water Act; NPDES; CERCLA; and discharge permit regulations.

• Ability to make difficult engineering computations and to design a variety of standard and complex Public Works and Utilities projects quickly and accurately.

• Knowledge of current and innovative computer applications is desired such as word processing, spreadsheets, CADD, GIS and water distribution modeling.

• Ability to gain basic knowledge of water rights and administration.

• Ability to obtain Water Treatment and Distribution licenses.

• Knowledge of materials, methods, equipment and tools used in capital project construction work.

• Knowledge of safe and efficient work practices that comply with local, state, and federal regulations.

• Knowledge of accepted engineering practice, and inspection and documentation techniques.

• Knowledge of methods and procedures of estimating cost of projects and construction work.

• Chair project meetings and keep focused when coordinating with other staff, engineers, contractors, and the public.

• Maintain accurate and up to date records.

• Read and interpret plans, diagrams, specifications, and construction drawings.

• Understand and carry out oral and written instructions.

• Adhere to project schedules and budgets.

• Present a professional, courteous, competent image that will reflect well on the Department and the City.

• Work independently in the absence of supervision.

• Communicate through written reports and documents that accurately summarize complex technical issues clearly, concisely and in a manner that can be understood by the general public, elected officials, and staff.
MATERIAL AND EQUIPMENT DIRECTLY USED
Computer terminals, keyboards, personal computer, telephone, cellular phone, facsimile machines, calculator, photocopier, survey equipment, and computer software programs. Will operate City vehicles.

WORKING ENVIRONMENT/PHYSICAL ACTIVITIES
This position involves both sedentary office work and trips to construction areas. Exposure to various weather conditions, noise levels, and a variety of construction activity. Occasional lifting and carrying of objects; some walking, standing, and climbing; vision for reading and interpreting information; speech communication; and having to maintain communications with regulators, consultants, contractors, and employees.

EDUCATION, EXPERIENCE AND FORMAL TRAINING
Graduation from an accredited college or university with major coursework in civil engineering or related field. Public Works and Utilities design/review experience required, Professional Engineer (P.E.) registration in the State of Colorado is required.

NECESSARY SPECIAL REQUIREMENTS
Must possess a valid Colorado driver’s license and maintain a safe driving record for continued employment. Successful candidates will be required to complete a pre-placement physical and a substance screen prior to employment.

PHYSICAL DEMANDS
The physical demands described here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

While performing the duties of this job, the employee is regularly required to sit; use hands and fingers, talk or hear, handle, or feel objects, tools, or controls; reach with hands and arms; climb or balance, and maneuver steep slopes and rough undeveloped terrain. The employee is regularly required to stand, walk, stoop, kneel, crouch, or crawl. The employee must occasionally lift and/or move up to 50 pounds. Specific vision abilities required by this job include close vision, peripheral vision, depth perception, and the ability to adjust focus. The employee is exposed to the use of a computer monitor for extended periods of time.

COMMENTS
The intent of this classification is to describe the types of job tasks and levels of responsibility and difficulty required of persons assigned to this classification title. This is not to be considered a detailed description of every duty/responsibility of the job.
The City of Black Hawk is an Equal Opportunity Employer. Pursuant to the Immigration Reform and Control Act, it is the City's intention to hire only individuals who are United States citizens or aliens authorized to work and live in the United States.