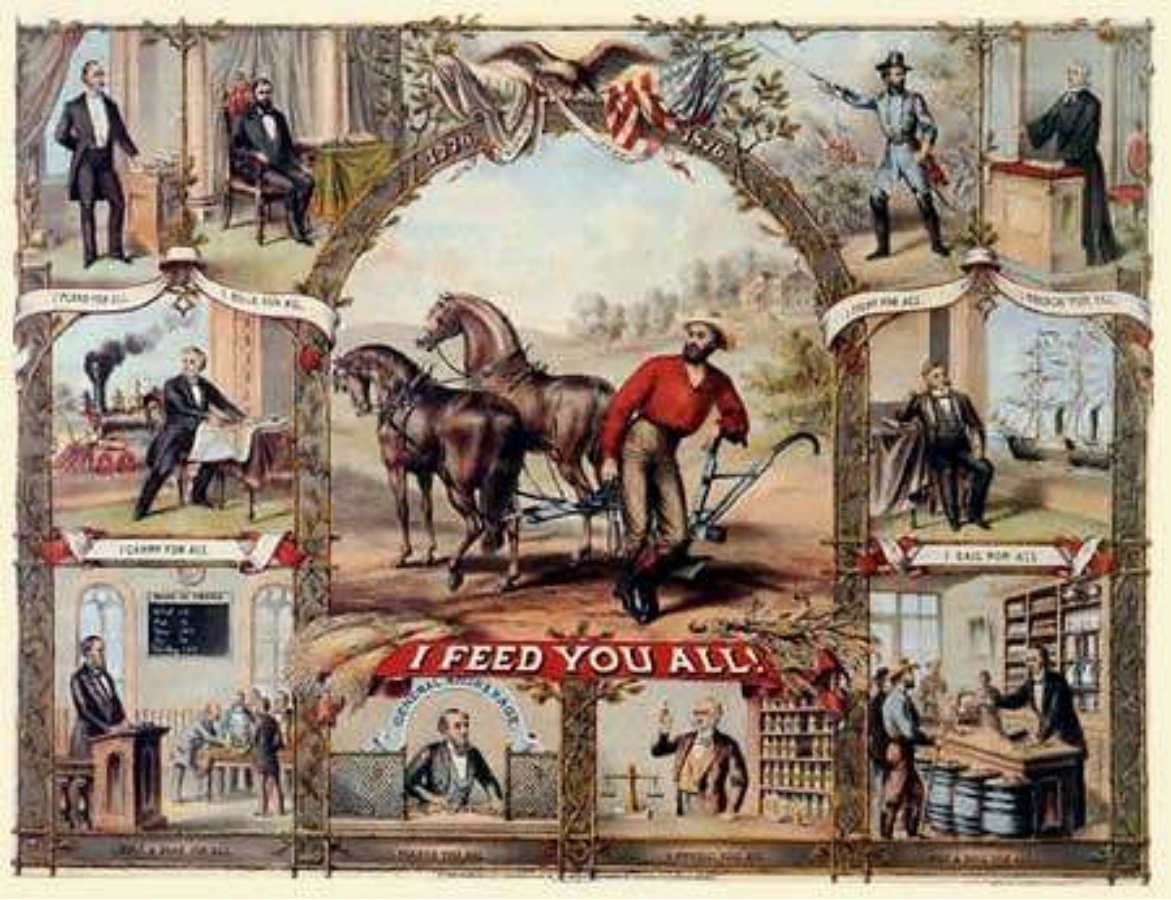
COALDALE SCHOOL

HISTORIC STRUCTURE ASSESSMENT

Coaldale Community Building
13607 County Road 6, Coaldale, Fremont County, Colorado 81222
Site No. 5FN1988



Poster from Order of the Patrons of Husbandry, the National Grange

Final Document—Deliverable No. 5
October 2007

Western Fremont County Historical Society and Coaldale Community Building Association
Funded by Colorado Historical Society State Historical Fund
Project # 2006-HA-038

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INTRODUCTION

RESEARCH BACKGROUND AND PARTICIPANTS

The former Coaldale School is used actively as a community center for the rural unincorporated area along the Arkansas River known as Pleasant Valley. Based on discussions about continued use and maintenance of the building, the Coaldale Community Building Association (CCBA) and Western Fremont County Historical Society (WFCHS) partnered to

- nominate the property to the State Register of Historic Places, and
- apply for funding for the Colorado Historical Society State Historical Fund (SHF) for a Historic Structure Assessment.

The assessment would provide a "road map" for ongoing maintenance and use of the building, as well as identify areas that need preservation attention.

Its president, Donna A. Nicholas-Griesel, represented the Coaldale Community Building Association, owner of the property. Other members of the association have also been involved in the nomination and grant application process.

Ms. Janice Yalch, a member of the Western Fremont Historical Society, wrote the nomination to the Colorado State Register of Historic Places, and it was listed on September 9, 2004. Ms. Yalch also applied to the Colorado Historical Society State Historical Fund (SHF) for funding for the Historic Structure Assessment, which was received in 2006.

Ms. Yalch and Mr. Bill Parks, who lives in Coaldale and also was once a student at the school, conducted interviews to select consultants to undertake the historic structure assessment. The firm of Central Colorado Preservation Partners, Inc. (CCPP) was selected. The firm demonstrated in-depth knowledge of and experience with historic structure assessments of other rural schools. Gary W. Higgins is the preservation architect, and Jackie W. Powell serves as preservation planner for CCPP.

On September 6, 2006, representatives of CCPP, CCBA, WFCHS, and SHF (Ms. Estella Cole) met to kick off the project and tour the building.

CCPP was provided with a copy of the nomination to the State Register of Historic Places, and was allowed access to the building to make observations, photographs, and measurements.

BUILDING LOCATION

Coaldale is a small hamlet located on US Highway 50 approximately 40 miles west of Cañon City, Colorado, in an area known as Pleasant Valley. The Coaldale School is located north of the juncture of County Road 6, known as Hayden Creek Road, and County Road 45, which used to be the old road to Canon City. The school is one of five buildings occupying a one-acre parcel that lies adjacent to a large dirt parking lot.

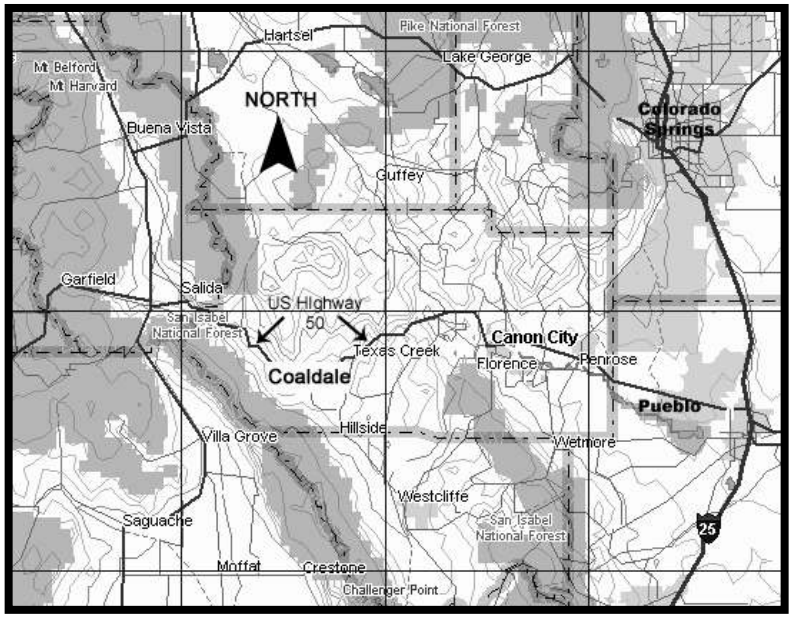
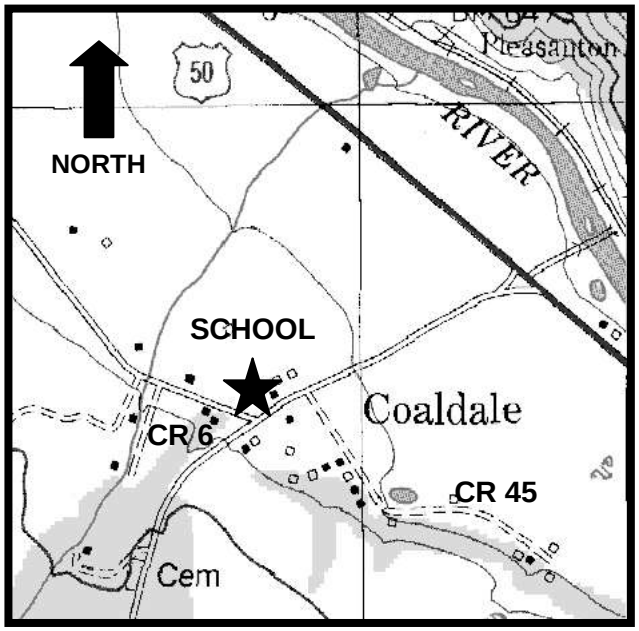


Figure 1. Coaldale Vicinity (above) and School Location (below)



LEGAL DESCRIPTION

The legal description is as follows:

"A tract of land in the Southwest Quarter (SW1/4), Section Thirty-three (33), Township Forty-eight (48) North, Range Eleven (11) East of the New Mexico Principal Meridian described by metes and bounds, as follows: Beginning at Corner Number One (1) of the Southwest Corner of the present West Fremont School District Number Fifty-one (51) (formerly School District Number Seventeen (17)) plot in Coaldale, Colorado, as fenced whence the Southeast Corner of Section Thirty-three (33) bears South 67 degrees 16 minutes East 3860 feet and running thence North 64 degrees 26 minutes East 336 feet to Corner Number Two (2); thence North 25 degrees 34 minutes West 132 feet to Corner Number Three (3); thence South 64 degrees 26 minutes 336 feet to Corner Number Four (4); thence South 25 degrees 34 minutes East 132 feet to the place of beginning, Containing one (1) acre more or less."[1]

[1] Legal description from a copy of the Warranty Deed to the property dated 18 August, 1956, supplied by Coaldale Community Association.

HISTORY AND USE

ARCHITECTURAL SIGNIFICANCE AND STRUCTURAL HISTORY[2]

ARCHITECTURAL DESCRIPTION AND STRUCTURAL HISTORY

The Coaldale School is a one-story brick building with a rectangular plan (62-1/2 by 32 feet) and a metal roof. The elongated building has a poured concrete foundation and red brick walls laid in a common bond [seven rows of stretchers to one course of headers]. Two slightly projecting stretcher courses serve as a belt course that encircles the building just below the windows. The red metal roof has wide; overhanging eaves with exposed rafters and is comprised of three sections. The main portion over the two classrooms is a moderately pitched, hipped roof. A smaller, lower pitched, half-hipped section runs the full width of the façade over the hallway. The central projecting entrance bay has a gabled roof behind a curved parapet wall.[3] A short, square, hipped roof bell tower straddles the ridgeline of the projecting gabled roof. Although the once open tower was enclosed with metal paneling, the bell still hangs in the tower and can be rung by pulling the rope that hangs just inside the door. Behind the tower, piercing the slope of the larger hipped roof section, is a brick chimney with a metal cap. Adjacent to the chimney, three metal stovepipes (two short and one tall) pierce the same roof slope.

The building faces southwest[4] toward County Road 45. A centered projecting entrance bay breaks the symmetrical façade. Square brick pillars frame the double leaf entrance doors and rise up to frame the curved parapet wall before ending with a concrete cap. A metal plaque is imbedded in the brick parapet wall above the entry with the words "State of Colorado Approved Standard School." A series of three large windows flank each side of the entrance bay. A smaller horizontally positioned window punctuates the expanse of wall near each corner. All the windows are rectangular, straight-headed, metal frames, multi-lights with rowlock brick lugsills.

The southeast and northwest ends of the building are devoid of any windows and are nearly identical except for the 5' by 18" wooden sign high on the southeast wall with the words "Coaldale Community Building" in gold lettering. Eight large, rectangular, straight-headed, metal-framed windows punctuate the rear wall of the school (northeast side). Each window opening contains 20 lights (4 rows of 5 lights) with the centered two rows of three lights hinged at the top operating as an awning window [In actuality, these windows are hinged horizontally along the center mullion and are called "pivoted" windows rather than "awnings"]. The majority of the glass is original, maintaining the waviness characteristic of old glass.

[2] Colorado State Register of Historic Properties Nomination Form, 2004. Verbiage in brackets by preparers of this HSA.
[3] The parapet is a flat vertical plane. The top is shaped in an upward arching curve.
[4] The State Register nomination form being quoted here uses the actual direction the facade faces for describing facade direction. The remainder of the document uses "Document North" as shown on the Floor Plan drawing, page 8. Therefore, the building front, here described as the southwest facade is called the west facade in the remainder of the document. The other facades are treated similarly.

Constructed in 1923 when both the Mediterranean and Mission Revival styles were popular in Colorado, Coaldale School exhibits elements of these two similar styles. The school's smooth wall surfaces, devoid of any ornamentation except the plain string course encircling the building, is a characteristic shared by both styles, as is the low-pitched roof behind a parapet, brick wall construction, and very limited ornamentation. The simple rounded parapet wall marking the projecting entrance bay is a nod to the more elaborate curvilinear parapets found on Mission style buildings. However, the school lacks the tile roof and round-arched windows and entries that are characteristic of both styles. Its lack of a definitive style notwithstanding, the building retains a great deal of integrity, having undergone only a few minor alterations since its construction.

The double leaf entrance (two solid wooden doors each with a tall, narrow piece of glazing) leads to a vestibule and the long narrow hallway that runs the full width of the building. Restrooms are positioned at each end of the hallway. (At the time of construction, a spring-fed cistern supplied water for the building, both for drinking and the restrooms.) There is a door into each of the two classrooms. The southern classroom contains a raised stage along the southeast wall. The original roll-up canvas curtain is still in use, complete with advertising from then-operating local businesses. The other classroom contains an elongated galley kitchen along the northwest wall. Between the two classrooms is the original wooden partition that folds back to make one large room, allowing for a larger audience for stage productions. The yellow pine divider consists of three doors and one narrow panel on each side, which meet in the center when pulled together. The divider is positioned between the two original teacher's closets and the two stoves.

The well-preserved building has seen only two exterior alterations. In 1996, the original "silver" corrugated-like metal roof was replaced with red "Powerpanel" and the bell tower was enclosed with metal panels to keep out the bats.[5] There have been few changes to the interior. Originally a drinking fountain was in a small alcove across from the front door; it was removed at some point and replaced with a table. The kitchen area was created in 1959 and the serving bar in front of the cupboards was installed in 1978. Electricity was installed in 1948. One of the wood-burning stoves was replaced with a propane stove about 1950.

By 1928, a cabin had been moved from Barn City to serve as a teacherage. This one-story, hipped roof, wood frame building lies west of the school. In approximately 1990, a gabled roof addition enlarged the cabin, which was converted to a medical clinic. Other recent alterations include the installation of siding and a red metal roof. The nomination boundaries were drawn to exclude this building due to its extensive alterations. [The site map later in this document shows the boundaries.]

SIGNIFICANCE

The Coaldale School is eligible for the Colorado State Register under criterion A in the areas of education and social history. Constructed in 1923, the building met the educational demands of the community serving as the only school until consolidation forced its closure in 1956. In most rural communities, the school also served an important social function. Often the only public building, rural schools became community centers hosting a wide variety of activities. The Coaldale School was no exception as the social life of Coaldale centered around this building

[5] It appears that the entry doors were also changed out, probably in the 1950s because they are a style from that period.

that contained a folding partition between the two classrooms which when opened created one large space with a raised stage at one end.

HISTORY

The *Salida Mail* ran an article on October 21, 1927 captioned "Pleasant Valley Resources Attract Earliest Settlers" that discussed the development of the valley and its two flourishing mountain villages, Coaldale and Howard. Located near the mouth of Hayden Creek, Coaldale received its name from the charcoal kilns located there in "early days." The population of Coaldale and vicinity was noted as "between two or three hundred which supports a post office, one general store and a school."

The earliest recorded information on Coaldale refers to the water rights of the Roger's Ditch at Vallie, on the west end of what would become the Coaldale area, in 1872-73. A post office was established in 1878 that underwent several name changes—Hayden Creek (1878-1880), Palmer (1880-1887), and Hendricks (1878-1891). On February 16, 1891, the post office name was changed to Coaldale.

Coaldale began as a farming and ranching community, but during the 1870s and 1880s, freighting stations also offered some employment for the early settlers. These stations provided horses for the stagecoaches and freight operations that ran from Canon City to Leadville. The wooded foothills also prompted the construction of numerous saw mills that made ties for the railroads and timbers and props for the coal mines while giving additional employment to the numerous settlers attracted to the valley. Settlers were also interested in livestock development, and large herds of cattle fed on native grass before being shipped to Denver and Kansas City markets. Around 1910, a dairy industry began. The abundance of waters in numerous creeks attracted farmers who raised alfalfa, wheat, oats, and other grains. The Portland Cement Company owned a quarry near Coaldale that shipped gypsum for use in cement manufacturing. Begun around the turn of the last century [beginning of the 20th century], this gypsum quarry employed local residents until just a few years ago.

The Coaldale School District No. 17 was formed in 1879, but did not operate as a "body corporate" until 1880. The first school was a one-room wood frame building that washed away in a flood in 1922. A larger school [the existing one] was built as a replacement. Constructed of brick from Salida, the new building was located further south and on higher ground. The *Cañon City Daily Record* on July 25, 1923, reported the following:

> An attractive, modernly appointed schoolhouse to cost between $6000 and $7000 is being erected at Coaldale in the western part of the county. The work is being done by a Salida contractor and is expected to be completed in time for the opening of school year in September. The building will be of frame construction and will contain sanitary sewerage with bubbling fountains, etc. Water will be piped to the building from a nearby spring.

The following month the *Salida Mail* (7 August 1923) reported on the new brick school being constructed at Coaldale at cost of $6000 that "will have two rooms and will be strictly modern." The article noted the contractor was A.W. Klarenbach and that the building would be completed by the fall term of school.

The two-room school instructed grades one through eight. A 1927 *Salida Mail* newspaper article mentioned Coaldale's modern two room brick school building and its "Two well paid teachers and excellent equipment with an enrollment of fifty pupils" along with its four-room teacherage. Bill Parks, who attended the school, remembers that there were 60 students in 1936. The older students occupied the "east side" [southern classroom], while the younger ones were in the "west side" [northern classroom].

The 1927 *Salida Mail* article also noted the importance of the building to the community. "The social life of Coaldale centers largely about the school. The school building is used as a community hall where community gatherings including Sunday school and preaching services are held." The building hosted other non-school related activities, including the annual Christmas party, dances, political caucus meetings, voting precinct, and grange meetings.

The Grange, Coaldale-Cotopaxi #397, had a long association with the building. Residents of the Cotopaxi community organized a Grange in 1926 with 50 members. People in the Coaldale area were accepted into the Cotopaxi Grange in April 1931. Several years later the name of the Grange was changed to Coaldale-Cotopaxi. The Grange alternated its meetings between the schoolhouses in both communities until 1939 when a fire destroyed the school in Cotopaxi. The Coaldale School then became the permanent Grange meeting site.

Despite Coaldale's large student enrollment over the years, the reality was that the school population in the rural districts of Fremont County was dropping. It was becoming apparent that the cost of operating the rural schools was increasingly out of proportion to the operation of schools in general. In 1950, there were 28 districts in the county still in operation, even though not all had teachers. Some of the smaller districts began transporting pupils by bus and paying tuition to larger schools. The time was ripe for a move to consolidate districts.

The first consolidation occurred in three districts east of Cañon City. The next consolidation was in the western part of the county when a petition for consolidation was initiated in District #17 [Coaldale] and District #41 [Cotopaxi]. The newly created district became West Fremont County Consolidated #51. The movement grew with District #13 [Stout Creek] voting 15 to 3 to unite with the new district, and sell their building to the Tenderfoot Saddle Club. With the acceptance of District #26[6], the West Fremont Consolidated District #51 was complete.

The formation of this new district made it the largest school district in the county with an area approximately one-third the size of the state of Rhode Island…. District No. 51 transferred ownership of the one-acre parcel on which the school stood to the Coaldale Community Building Association with a deed filed September 18, 1956.

The building continued its role as a community center on a full time basis after consolidation forced the school to close. However, an educational component continues with adult education classes and volunteer firefighter training being conducted in the building. In a community without a church, the school also serves as a wedding hall. Other social activities include the annual community Thanksgiving potluck. The building serves as the meeting hall for several local clubs, including the Coaldale Valley Club, Christian Women's Connection, and the Western Fremont Historical Society. The building also hosts a weekly quilting get-together, exercise enthusiasts, and a morning coffee group. The school is the focal point of all these activities that continue to bind this close-knit community.

[6] The location of District #26 is not known at this time.

Figure 2. Presentation of First Aid Kit to Coaldale Community Building Association, 1997. From left, Louise Nelson, Barbara Straight, Pearlene Davies, Bill Davies.

Figure 3. Square dance at Coaldale Community Center, 2006.

Figure 4. Square dance at Coaldale Community Center, 2006.

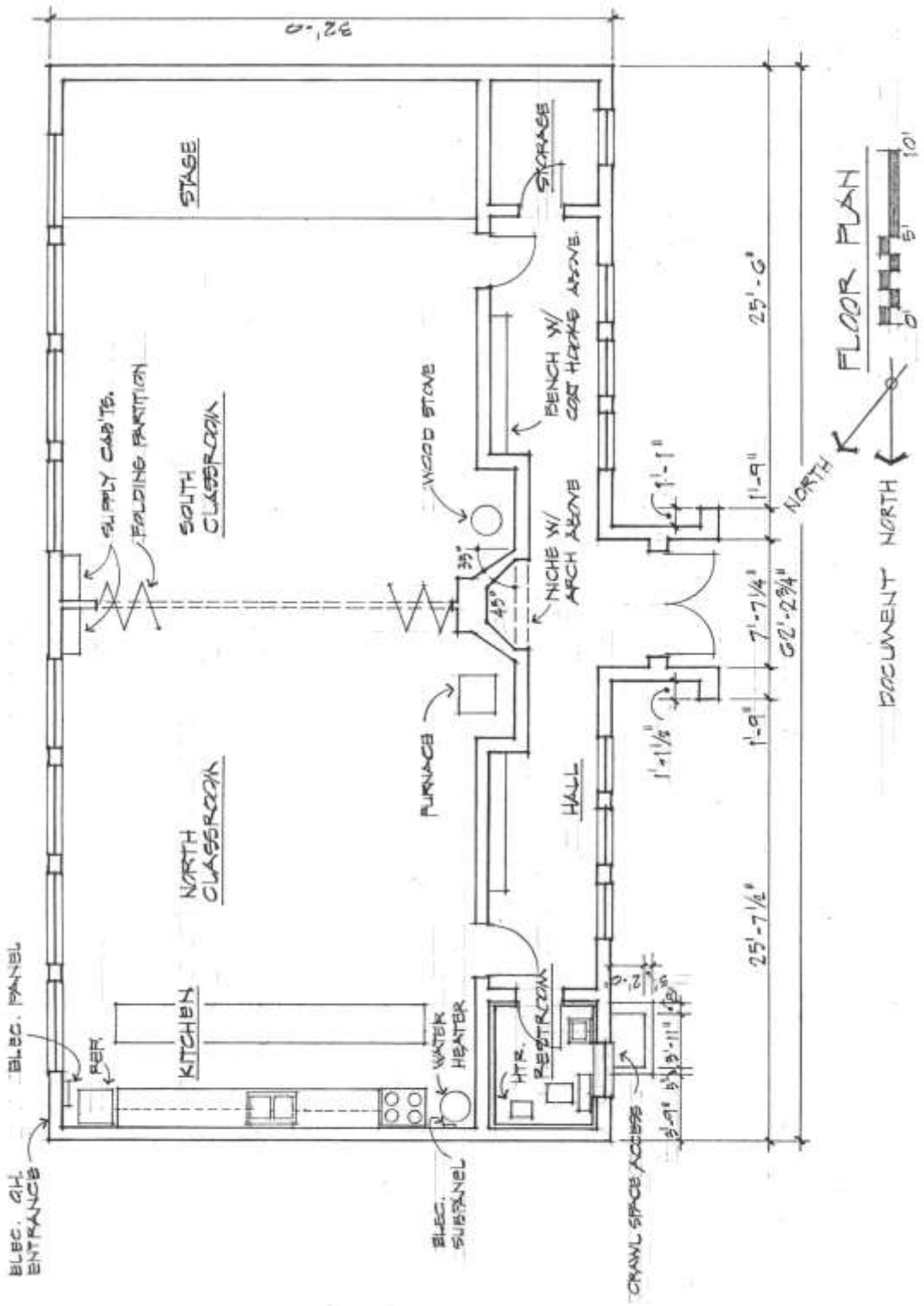
Figure 6. Quilting at Coaldale Community Building, 1999. Traci and Sharon Clifton.

PROPOSED USE

The community of Coaldale has successfully operated its community building, formerly Coaldale School, for 50 years. There are no plans to change its use, and therefore it will continue to be the primary meeting place, social center, and event location for Coaldale for the foreseeable future.

Figure 6. Clockwise from top, Donna Nicholas-Griesel CCBA) , Estella Cole (SHF), Jackie Powell (CCPP), Alvera Leitner (CCBA) and Bill Parks (CCBA) discuss beginning the Historic Structure Assessment.

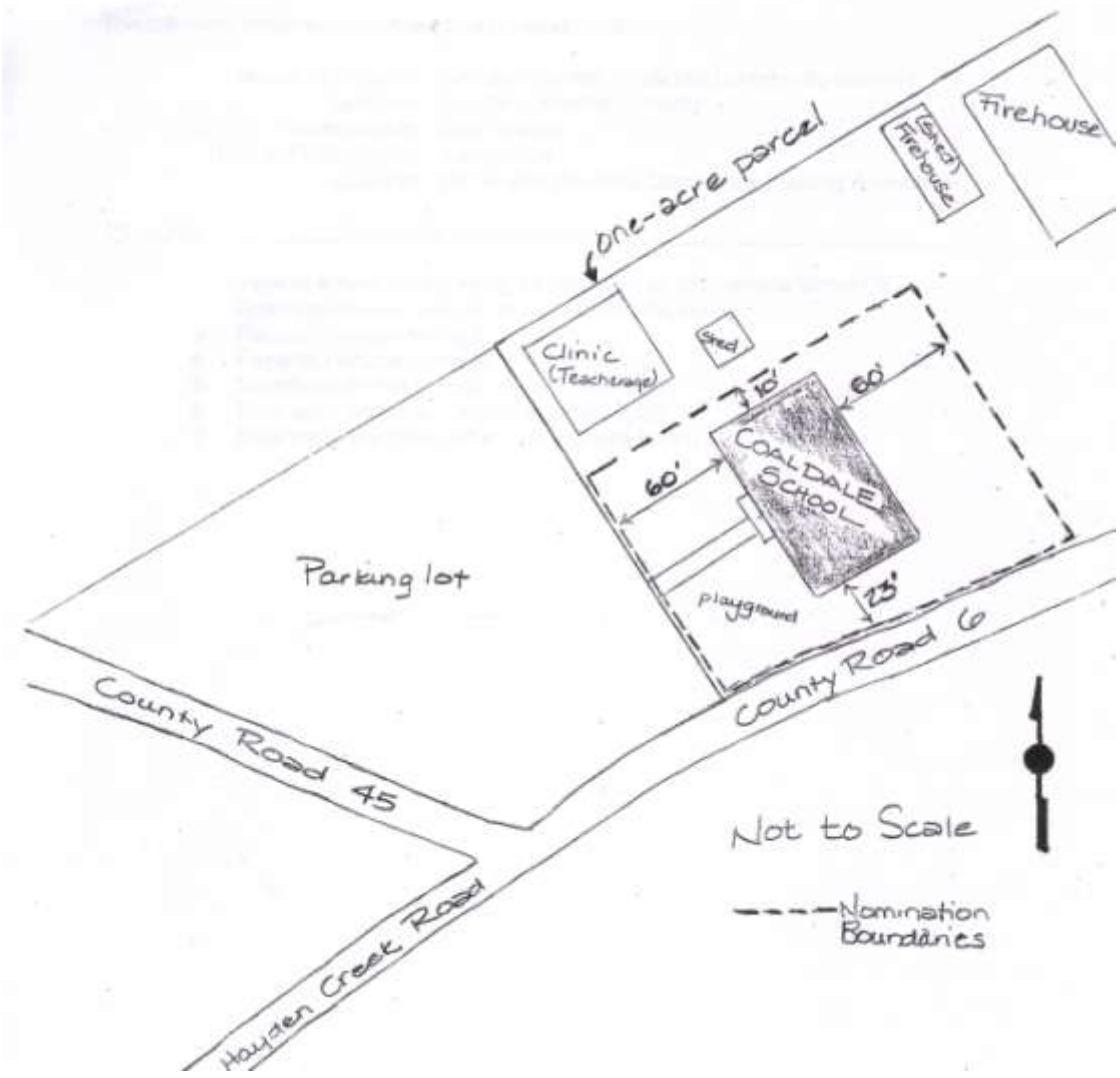
FLOOR PLAN


STAGE
STORAGE
BENCH W/ COAT HOOKS ABOVE
WOOD STOVE
SUPPLY CAB'TS.
FOLDING PARTITION
SOUTH CLASSROOM
NICHE W/ ARCH ABOVE
FURNACE
HALL
NORTH CLASSROOM
KITCHEN
REF.
WATER HEATER
HTR.
REGISTER
ELEC. PANEL
ELEC. GH. ENTRANCE
ELEC. SUBPANEL
CRAWL SPACE ACCESS
25'-6"
1'-1"
1'-9"
7'-7¼"
62'-2¾"
1'-1½"
1'-9"
25'-7½"
NORTH
FLOOR PLAN
DOCUMENT NORTH

STRUCTURE CONDITION ASSESSMENT

SITE

COALDALE SCHOOL SITE PLAN[7]



[7] From Colorado State Register of Historic Properties Nomination Form, 2004

EXTERIOR PHOTOGRAPHS[8]

Figure 7. West (front) façade of Coaldale School, looking east.

Figure 8. Coaldale School entrance, looking northeasterly.

[8] Attempts to locate historic photographs for this document by the preparers and by the community have been unsuccessful.

Figure 9. East façade of Coaldale School, looking northwest.

Figure 10. North façade of Coaldale School, looking south.

Figure 11. South façade of Coaldale School, looking northeasterly.

ASSOCIATED LANDSCAPE FEATURES

DESCRIPTION

Coaldale School is located at the junction of Fremont County Roads 6 and 45. It is part of a one-acre complex of community buildings that have accumulated over the years, starting with the school. These include the former teacherage, now a medical clinic, two frame sheds, and a firehouse. Only the school and schoolyard are within the boundaries of the State Register of Historic Places nomination.

A straight concrete sidewalk runs directly to the front door from the parking area. Playground equipment is located on the south side of the sidewalk. There is a five-sided wood and metal merry-go-round, which is missing the wood seat on one side. Paint is flaking from the remaining wood elements. The metal portions are rusty, but not badly deteriorated. There is also a three-seated metal swing set, painted red, with a gravel pad beneath. A picnic table is located by the swings, near the trees that run along CR 6. Although it may have been painted at one time, it is now down to bare wood. Another picnic table is located north of the sidewalk. It is painted white, but the paint is beginning to flake.

A line of deciduous trees edges CR 6 along the south side of the schoolyard, and turns the corner at the parking lot to continue for a short distance between the parking lot and the schoolyard.

A large western red cedar stands just north of the entrance to the building (See Figure 7). It has been limbed up to allow light into the interior hall. This also allows good air circulation at ground level. The brick does not appear to be abraded by the tree.

A large lilac bush is more or less centered in front of the south hall windows. A hedge of large lilac bushes lines the back, or east, wall of the school (Figure 9). These prevent easy access to the exterior walls for maintenance and repair. There is concern about moisture retention against the foundation wall and root penetration of the foundation associated with these shrubs.

Annual flowering plants such as cosmos are planted in a small informal bed at the entrance. The lawn is native grasses, quite skimpy due to low average annual precipitation.

At the rear of the building is a horseshoe court. The stake at each end is surrounded on three sides by a low concrete wall.

EVALUATION

All the playground and recreational equipment are in **good** condition, except the merry-go-round, which is in **fair** condition.

TREATMENT RECOMMENDATIONS

- The picnic tables and merry-go-round should be repaired and painted.
- The line of trees along CR 6 should be monitored, and regular maintenance performed to ensure their continued health.

- The area around the western red cedar beside the entrance should be monitored to assure there is no brick damage or problems from moisture associated with the microclimate at that location.
- Due to the concern about moisture against the foundation and the potential for root penetration of the foundation, the lilac hedge should be moved to a trench beginning six feet from the building. Retaining the hedge will not only retain this piece of the cultural landscape, but also visually screen the new exit if located in the east wall. It is preferable that the same rootstock be used. Preparing the soil to receive the lilacs should take place a soon as possible. The County Extension Agent can provide advice on how best to lift and replant the lilacs and what care they will need to assure that they flourish.

PARKING

DESCRIPTION

Parking is provided in a large unpaved area west of the schoolyard, outside the State Register designation boundary. Drainage is good. It is reported that as many as 75 vehicles have parked in this area, and it provides adequate parking for the clinic and community building functions.

EVALUATION

The parking lot is in **good** condition.

TREATMENT RECOMMENDATIONS

Fill washouts, keep accessible parking space evenly graded and free of stones and debris.

ARCHAEOLOGY

DESCRIPTION

No archaeological survey or testing has been conducted at the Coaldale School.

There were three privies near the school site, all outside the register boundaries. Two were along the north property line, near the teacherage and the Woodshed. A third was at the east fence line southeast of the Firehouse.

EVALUATION

The likelihood of finding significant archaeological remains on this site is **low**.

TREATMENT RECOMMENDATIONS

Ground disturbance during any planned construction projects should be monitored and recorded photographically by a preservation architect. If non-architectural remains are encountered, work should be stopped and an archaeologist contacted for advice on how to proceed.

FOUNDATION

FOUNDATION SYSTEMS

DESCRIPTION.

Foundation. The foundation system is formed concrete stem walls on continuous mortared rubble cobblestone footings. Stem walls are 8" thick. The rubble cobblestone footings appear to be slightly thicker and were apparently constructed without forms. One test pit was dug at the southeast corner to observe the footings; it is assumed this system was used for all the masonry bearing walls in the building.

Parget coat. The exposed (above grade) exterior faces of all foundation walls are coated with a gray colored rough parget coat. It is appears to be a pebbledash stucco coat, thrown directly against the concrete of the foundation wall. There are places where the pebbledash surface follows the ins-and-outs of the horizontal concrete formboard marks. This seems to indicate that the forms were set roughly, or in some locations, moved slightly during concrete placement. These horizontal lines are especially evident when viewed under a noon sun at the east end of the south façade.

Figure 12. Foundation wall. South wall, southeast corner, showing parget coat over horizontal formboard marks.

Crawl space access. Near the north end of the west wall is the only crawl space access hole. It penetrates the stem wall with a 3'-0" wide opening. In the ground in front of the foundation opening is an approximately 3'-0" x 2'-0" formed concrete areaway. The top of the areaway concrete is a few inches above grade and at the same level as the top of the foundation. The areaway is filled with a variety of removable insulation types and covered with a loose wood framed cover. For weather proofing, this cover is topped with the same red metal roofing used to roof the building.

Figure 13. Crawl space entry cover. West wall, looking northeast

Figure 14. Crawl space entry, north end of west wall. Below the pieces of fiberglass batts is more insulation of various types.

Foundation/crawl space ventilation. There are three screened foundation vent openings. One of these, through the south segment of the front (west) foundation wall is located adjacent to the intersection of this wall and the south entry wall. It is 20" x 6" providing nominally 120 square inches (0.83 sq. ft.) of ventilation. The top of this opening is approximately 6" below the top of foundation. The bottom of the opening is currently slightly below grade. It has a wood frame,

somewhat recessed behind the face of the foundation wall. One-quarter inch hardware cloth covers the opening. The other two foundation vents, 8" x 6" (96 square inches or 0.67 sq. ft. of ventilation), are in the east wall about 12'-8" from the north and south corners and are also covered with hardware cloth. These, however, are trimmed out with 1x2 wood on the face of the foundation wall. The top of the northernmost opening is approximately 12 ¾" below top of foundation and the southernmost is approximately 9 ½" below top of foundation.

Figure 1. Crawl space vent, west wall at intersection of entry Wall. Note more spalled and poorly patched brick.

Figure 2. Crawl space vent, east foundation wall.

The dirt floor of the crawl space roughly follows the same slope as exterior grade, being deeper at the east wall than at the west.[9]

EVALUATION

Foundation. The foundation is in **good** to **fair** condition. There has been some foundation movement in various areas that has resulted in visible vertical cracks in the pebbledash coat. This cracking can be seen in all four exterior walls. In a few places the foundation cracking has projected upward into the brick masonry where it follows the joints in stair-step fashion, and in a few cases has broken through the brick. (See additional discussion under Masonry heading.)

Figure 17. Foundation crack, east wall at northeast corner. Crack continues up to end of window sill (See Figure52 for same crack on interior).Stain on pargeting is probably due to moisture entering the crack.

Parget Coat. Much of the pebbledash pargetting is deteriorated and loose from the foundation concrete, both above and below grade level

Crawl Space Access. Crawl space access is **poor**. The current crawl space access is in a self-defeating location being at the west foundation wall where grade is highest. The areaway, nearly at grade, is relatively small making entering and exiting the crawlspace very difficult (see Floor Plan, page 8). Also by entering through this wall, the main classroom foundation wall (which has a person-hole though it) is encountered a short distance inside, complicating entry into the main crawl space. It is impossible to take straight rigid objects such as pipe or ducting into the crawl space. A new crawl space access opening is needed directly into main area under the classrooms.

Crawl Space Ventilation. Crawl space ventilation is **poor**. At the requirement of 1 sq. ft. of ventilation per 150 sq. ft. of crawl space area, the building requires approximately 10.27 sq. ft of

[99] Bill Parks, personal communication, 10-30-06.

ventilation. The three existing crawl space vents supply a total of approximately 1.5 sq. ft. of ventilation and the west wall vent being below grade is prone to being blocked. Once again, due to Colorado's forgiving climate, the code requirement may be excessive. But, even though there is no apparent damage from moisture in the crawl space, the preparers believe ventilation should be increased to at least half of the amount required by code, or approximately 5 sq. ft. This would assure at least some ventilation if/when the vents become clogged or blocked.

As stated below, grade along the west wall should be pulled down, an action that may allow an increase in height (in the vertical dimension downward) in the single existing vent on the west wall. The existing vents on the east wall are sufficiently high above grade that regrading will not affect them and they could also be increased in height in place.

Figure 18. Stone rubble exposed below pebbledash stucco parget coat. East end of south wall, looking north.

[10] Bill Parks, Personal Communication, September 6, 2006.

TREATMENT RECOMMENDATIONS

- Install crack monitors in several locations, especially near the north and south corners of the east wall and at the crack on the west wall near the current crawl space access. (See Masonry section for additional locations.) Keep monthly log of the readings for a year. If the cracks are active, engage a structural engineer to determine course of action. If the cracks are not active, or after foundations have been stabilized, remove loose pebbledash stucco coat; fill crack with appropriate, i.e., compatible, cement grout and patch pebbledash finish. Do no work on foundations until results of crack monitoring are known.
- Excavate entire foundation perimeter to minimum of 6" below existing grade. Sound all exposed areas of pebbledash stucco coat with a wooden mallet or gloved fist to determine areas where stucco is not well adhered to foundation wall. Remove loose stucco and patch with pebbledash stucco to match existing adjacent work in all aspects including material properties, color and texture.
- Install new crawl space vents to provide a total of at least half the code requirement, or about 5 square feet. In as much as possible, ventilation should be balanced approximately 50-50 between the east and west walls. If used, operable vents offer the opportunity to be partially closed during winter months. As pointed out in the access recommendation below, the new crawl space access door in the east wall could be constructed to include a vent
- Install a new crawl space access opening, minimum 18" x 24". It should be located in the east foundation wall where the crawl space is deepest, probably near the center of the wall length. It should be equipped with a manufactured or fabricated vandal-resistant lockable steel door. It would be desirable to incorporate a ventilation screen so as to serve a dual purpose. The access door and trim should be painted to match the pebbledash color.

PERIMETER FOUNDATION DRAINAGE

DESCRIPTION

The site slopes generally from west to east toward the Arkansas River such that only 3" - 4" of foundation is revealed above grade at the northwest corner and 3 feet is above grade at the southeast corner.
No subsurface perimeter foundation drainage system is known to exist.

EVALUATION

Positive grading away from the foundation wall is spotty. The whole of the west wall except the far southern end is basically flat or has a negative slope. The north and south walls have a reasonable slope away from the foundation. The east wall has a negative slope due to the lilac plants. A significant amount of soil, leaves and other windborne debris has accumulated at the bases of the plants causing a sort of dam that prevents water from draining away from the wall.

Since there are no gutters on the roof, there is a distinct drip line directly below all four eaves of the hipped roof structure. On the plus side, the soils are well-drained gravels.

TREATMENT RECOMMENDATIONS

- Regrade around entire foundation wall to effect a slope of 6 inches in 10 feet for a minimum distance of 10 feet from all foundation walls. The soils should be pulled down so that they are at least 6 inches below top of foundation wall.

- This will require a swale at the north end of the west wall and at the west wall immediately south of the entry. The swale should drain around the building corners to the east, keeping the low point of the swale at least 10 feet from the building. Even after regrading, the drip line will continue to erode the soil, a condition that requires regular maintenance attention.

STRUCTURAL SYSTEM

GENERAL STRUCTURAL SYSTEM

Coaldale School is a one-story load bearing brick structure on mortared cobblestone foundation with a wood floor system over a crawlspace in the classroom areas and the restroom and storeroom (former restroom) and a concrete slab on grade floor throughout the Hall. The roof is a long hip with a shed over the Hall. The entry roof is a gable that intersects the main roof on the west side of the building. It is surmounted with a square cupola/bell tower.

Description, evaluation and recommendations for foundation structural systems are found in the FOUNDATION section and for wall structural systems are found in ENVELOPE-EXTERIOR WALLS section.

FLOOR AND CEILING SYSTEMS [11] [12]

DESCRIPTION

The main floor structure in the classroom area is 2 x 8s @ 16" on center running east and west. There is 1 x 8 diagonal subfloor above. There are two beams supporting the floor joists running north-south at the one-third joist spans.

The restroom floors also are wood frame. However, the Hall floor apparently is a concrete slab on grade. Its thickness and reinforcing, if any, is not known.

The ceiling is plaster on wood lath on 2x6 ceiling joists @ 16" on center. Over part of the ceiling framing, boards have been nailed down to provide a walking surface. See roof framing system below for integration of roof and ceiling structural systems.

[11] In an informal discussion with Jim Joy, former SHF Preservation Specialist, it was learned that he did a research paper on lumber while a research assistant in the CSU Preservation program. One of his findings was that the first national lumber standard was developed in 1924. As with many things, it took awhile to become widely recognized and used, especially in rural areas. The title of the paper is not known.

[12] This report will use nominal dimensions to describe lumber sizes regardless of whether they are actual or nominal. Where it is deemed essential to the understanding of existing conditions, further description of lumber may be included.

EVALUATION

- The floor system is in **good** condition. There is little or no bounce in the floor system and no obvious soft spots.
- The ceiling framing system is likewise in **good** condition. Roof deflection for whatever reason, may cause ceiling movement. There is a pronounced longitudinal plaster crack in the center of the north classroom area ceiling. This crack could have resulted from a single event such as a heavy wet snow or it could be the result of the roof/ceiling making small repetitious movements over time under snow and wind loads.

TREATMENT RECOMMENDATIONS

- No recommendations for floor framing.
- Monitor ceiling plaster cracks to determine whether roof/ceiling system is moving excessively. See Interior Finishes section for recommended ceiling treatment.

ROOF FRAMING SYSTEM

DESCRIPTION

Main Roof

The hipped roof framing in the main part of the building is 2 x 6s @ 24" on center. There is a nominal 20 ½" rafter overhang. Main roof pitch is approximately 7 in 12. The flat ceiling in this part of the building is framed with 2 x 6s @ 16" on center. Because the ceiling joists and roof rafters are at different spacing, they are tied together only every 4 feet, i.e., at alternating roof rafters and every third ceiling joist. However by virtue of their being nailed to the same bearing plate an additional strengthening is achieved at each member. Also every 4 feet where roof and ceiling supports coincide, there are five 1x6 struts connected to both roof rafters and ceiling joists. One in the center is vertical from ceiling joist to ridge. To each side of this vertical strut along the ceiling joist are diagonal struts leaning in the outward direction from the center spanning up to the rafters. At the point where these struts are nailed to the rafters a final strut is fastened to both the rafters and joists. These latter are nearly vertical, tilting slightly outward at

Figure 19. Main roof framing in attic, looking west. Note ceiling. Framing spacing different than roof and chimney at eave.

the top.
In form, this assembly resembles a 4-panel Howe truss. Whether these were intended as trusses or actually work as trusses is not known.[13] Since no gussets were incorporated in the design, it is unlikely that the connections would stand up to the rigor of truss analysis.

Front Hall Roof
The front hall shed roof is framed at a 3 ½ in 12 pitch in the east-west direction with hips at each end. It is comprised of 2 x 6 rafters on 24" centers with a 22 ½" overhang at the rafter tails. The upper ends of these rafters project over the top of the brick wall plate of the main building wall into the attic space.

Entry Roof
There is an intersecting 4 ¼ in 12 pitch gable roof centered on the west wall over the building entry framed with 2 x 6s @ 24" on center with a 23" overhang. It terminates at the mission style parapet of the brick entry front that extends above the roofline.

Belfry
A small hip roofed 4' - 6" square cupola/belfry straddles the entry roof ridge. Its 5 in 12 pitched roof is framed with one 2 x4 rafter at each corner and one centered over each of its short walls. The rafter tails extend beyond the exterior cupola walls to form a 9" overhang on all four sides.

Figure 20. Belfry roof framing. All eight rafters extend beyond belfry sidewalls to form overhang.

The wall corners of the belfry are comprised of vertical 2x4s each reinforced on the two outside faces by rough-sawn wood members that are approximately 1 x 6. This framing is tied into the entry roof/ceiling framing. The bell is supported on its north and south sides by a decorative cast

[13] The stresses of all members of true trusses are in either direct tension or compression, not in bending. Connections must be up to the task of withstanding the stresses imposed on the truss members they connect.

iron or cast steel frame. The frame has four feet that sit on an east-west wood member, measuring 2 ¾" x 3 ½". Screws through the feet secure the bell to the support. The ends of these east-west members are in turn supported on two north-south members, measuring 6" x 4", which are tied into the belfry wall supports and entry roof framing.

The bell rope attaches to a wheel on the south side of the metal bell yoke and passes through a double wheeled guide before dropping through the rope-hole in the entry ceiling. The guide is mounted to the side of one of the wood support members.

Figure 21. Bell in belfry, looking east.

Figure 22. Bell, bell wheel, yoke, and southernmost bell support.

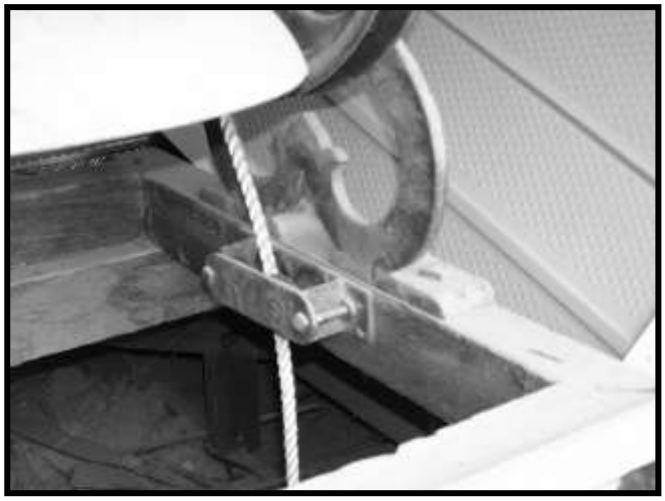


Figure 23. Belfry showing foot of southernmost support and bell rope through double roller.

EVALUATION

Main Roof
The main roof framing is in **good** condition. There appears to be no permanent deflection in the rooflines and planes and no obvious deficiencies. The rafter tails are in **good** condition and appear to adequately support the roof overhang.

Front Hall Roof
The Hall roof framing is in similarly **good** condition. There is a short (approximately 12" long) 2 x 4 scabbed-on to the side of each rafter tail at the west overhang, apparently nailed up by the metal roofing contractor. These scab-ons extend about 1-½ inches beyond the ends of the rafter tails. However they exist only at the west overhang and nowhere else. Their purpose is not known for certain, but the lower 2" of the lowest original roof sheathing board is unsupported beyond the ends of the original rafter tails. The new ½" OSB sheathing extends anywhere from 5/8" to 1 ½" beyond the lower edge of this roof sheathing board and the new metal roof extends approximately 3" beyond the lower edge of the OSB. So there are places where the moment arm of the sheathing/roofing would extend 6 ½" beyond the end of the supporting rafter tail were it not for the scab-ons. It is likely that this assembly would carry itself even if the scab-ons were removed, but it is enough of a borderline condition that remedial measures should be taken.

Entry Roof and Belfry
The entry roof framing, bell supports, and the belfry and belfry roof are in **good** condition.

One of the metal bell support feet is cracked, but this condition does not appear to have a negative effect on supporting the bell weight and movement.

TREATMENT RECOMMENDATIONS

Main Roof

- Observe ceiling regularly through time to see if crack reopens, in which case remedial action is required. Inspect monthly and during or immediately after heavy snow or wind events is recommended.
- Paint rafter tails and underside of roof deck at overhang.

Front Hall Roof

- Remove scabbed-on 2x4s. Install continuous 1x board screwed to the underside of the original eave sheathing board. (See Soffit Detail Sketch, West Roof, Figure 25.) the sheathing.
- Paint rafter tails and underside of roof deck at overhang.

Entry Roof

Paint rafter tails and underside of roof deck at overhang.

Belfry Wall and Roof Framing

Paint rafter tails and underside of roof deck at overhang.

Figure 24. Roof overhang at north end of west façade, looking northerly. Notice scabbed-on 2x4s and excess roofing overhang.

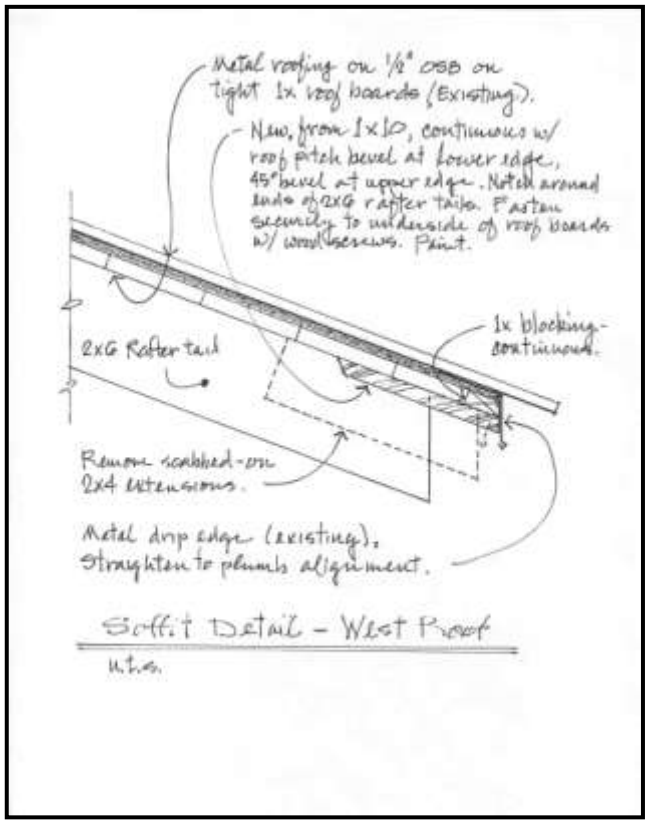


Figure 25. Soffit Detail Sketch, West Roof.

ENVELOPE – EXTERIOR WALLS

EXTERIOR WALL CONSTRUCTION

DESCRIPTION

The exterior walls above the foundation are double wythe, 8" thick load bearing brick masonry. The wall between the classrooms and the hall are of the same construction. The field of the brick is flush with the outside face of the foundation wall. There is some decorative brick masonry in the form of water table and belt courses and rowlocks; it is described below under the Exterior Masonry heading.

EXTERIOR FINISHES

DESCRIPTION

Exterior finishes are limited to painted wood trim closers between rafter tails, the underside of the roof boards at the exposed soffit, wood doors and trim, and painted steel windows.

EVALUATION

Wood trim members are in good condition, but need paint. Some filler boards between rafter tails and at window heads are loose.

TREATMENT RECOMMENDATIONS

- Check all trim elements for secure fastening. Renail, or otherwise secure, any that are loose.
- Paint exterior trim.

EXTERIOR MASONRY

DESCRIPTION

The exterior masonry is common bond with a header course every 8th course. Common bond usually is 5 or 6 stretcher courses between header courses, so 7 stretcher courses between header courses is a bit more than usual common bond. The dry pressed bricks are 8 1/4" x 3 3/4" to 3 7/8" wide x 2 1/2" high, laid up with 1/2" flush to slightly concave joints. In many locations, but inconsistently applied, unworkmanlike struck joints were used for both the horizontal and vertical joints.

Figure 26. Brick with imperfections at north wall. Note vertical crack through the imperfection which is the weakest point.

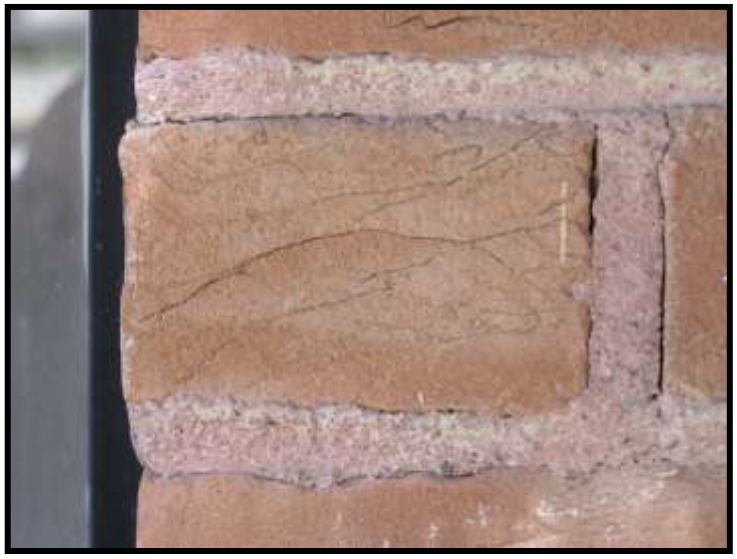


Figure 27. Dry pressed brick, end view. Cracks in brick are from hand placement of clay in the form. Brick probably laid with bottom up. Note red tinted mortar and stuck joints, vertical and horizontal.

There are some decorative projected brick bands and similar features, but the brickwork is much less elaborate than that found in late 19th century buildings. It is quite subtly refined and understated, as was the trend in this period. Starting from the top of the foundation wall the brick work is as follows: 3 courses of brick projected approximately ¾" as a water table completely surrounding the building, one header course in the field directly above the water table, with 6 stretcher courses of field brick above it. Above this is another band made up this time of 2 projected stretcher courses that completely surrounds the building. On the two end walls, the

north and south, and at the window pilasters, a header course is laid up on top of the projected band, starting the common brick bond that continues up to the eaves. At the east window wall the rowlock sill is laid up on top of the 2-course projection. At the west wall where the windowsills are slightly higher, there is a stretcher course above the 2-course projection and the bottom of the rowlock window sill. Additionally, above the rear (east) windows there is a projected stretcher course. The brickwork above the window and door openings is carried on steel lintels.

The double door entry is formed by a brick wall with a portal slightly larger than the doors. The top of this wall is a decorative humped parapet topped with a flush rowlock coping, flanked by two brick pilasters that rise above the roof line and form the corners. These pilasters are capped by a single projecting brick course and a cement wash. This entire front is a Mission style expression. (Figures 7 & 8)

There is a plain brick chimney that penetrates the roof over the common masonry wall separating the classrooms from the Hall. In the north-south direction, it is nominally centered on the ridge of the entry. It is 3'-2 ¾" wide (in the north-south direction) and 1'-9 ¼" deep, standing 6'-0" above the roof on its low side. The brick joints especially in the upper half have been poorly repointed, with mortar smeared over the surface of the brick. A metal rain cap painted red surmounts the chimney

Figure 28. Chimney with red painted steel cover, looking northeast.

In several locations cracks seen in exterior brickwork penetrate the walls and appear as vertical or diagonal cracks in the interior walls. Most of these are in the window sills and heads. There are some places where the problem appears to be serious enough to merit concern. One of

these is on the west facade below the sill of northernmost window. Here the crack extends up from the top of the foundation to the brick sill. Another is low in the east wall at the northeast building corner where the foundation is cracked and the crack extends up to the sill of northernmost window. And yet
another is in the field of the north wall where a crack in the foundation wall extends as a very thin crack upward through vertical joints and brick alike almost to the top of the wall.

*Figure 29. Brick damage inflicted by adults, **twice**—first by making holes, second by inappropriate patching.*

Figure 30. Crack at sill and below, south end of sill, northernmost window in Hall.

Figure 31. Vertical hairline crack to left of kitchen waste vent, north wall. While crack is thin, it is very long, continuing several feet downward and upward from eye level.

Figure 32. Northernmost entry pilaster, looking southwest from behind. Note open mortar joints.

Evaluation

Overall, the masonry is in **good** to **fair** condition. Some corner areas have been worn to a rounded shape over the years through the idle or mischievous manipulations of children's hands. A number of individual bricks have been broken through by building movement, and some individual bricks are spalled. There is some stair-step cracking in the masonry joints due to building movement and minor erosion of brick joints in exposed areas as well as shrinkage of mortar from brick surfaces, the latter of which may have been due to having not wetted the brick sufficiently when they were laid up, especially if the work was done in very hot dry weather. It is not known whether the foundation and masonry wall cracking is still occurring or if it has stabilized.

The chimney brick is in **fair** condition, as is the brickwork on the upper part of the entry façade.

TREATMENT RECOMMENDATIONS

- Install exterior and interior crack monitors in at least four locations: at the north and south corners of the east wall; at the stair-step crack in the west wall near the current crawl space access; and at the hairline vertical crack in the north wall. Adequate monitoring will require approximately a dozen crack monitors.
- Monitor and record crack monitor readings monthly for a year. Postpone all brick work until results of crack monitoring are known and movement has been stabilized.
- Replace individual broken and spalled bricks

- Do not replace rounded corner bricks that are in otherwise good condition. They should be saved in place as a record of the small hands and clapping blackboard erasers that were responsible for the condition.
- Repoint eroded mortar joints with mortar of the same composition, color, and joint style. Mortar samples should be analyzed to determine composition.
- Repoint chimney brick, replacing individual damaged bricks.
- Remove cracked and loose mortar wash at window sills and parapet. Patch and replace in kind with compatible mortar.

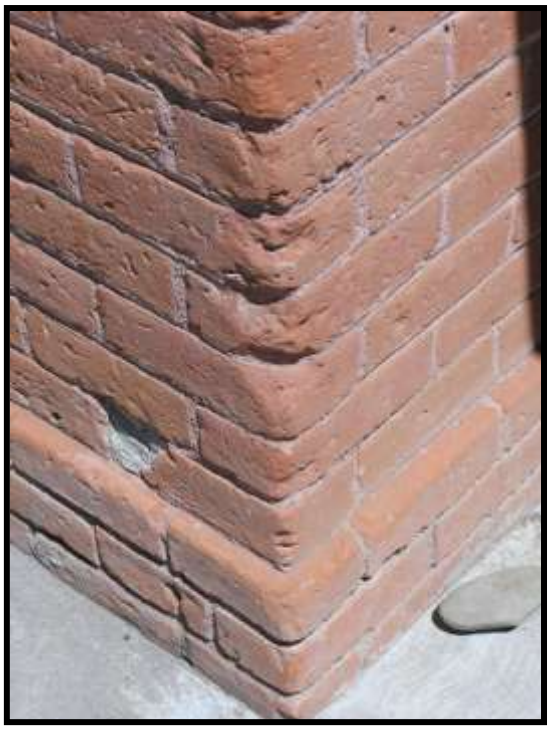


Figure 33. Brick corner low on pilaster at entry. Most of the rounding and damage can be attributed to children and should remain, unless or until it becomes a structural problem. Compare with Figure 35.

Figure 34. Mortar wash, east wall northernmost window. Deterioration is typical of similar in several locations.

Figure 35. Brick corner high on pilaster at entry. Compare with Figure 33.

Figure 36. Spalled and patched brick.

Figure 37 (Left) Brick pilaster between windows, south portion of west wall. Note red tinted mortar with struck joints, spalled brick corner, and open joints at upper courses.

Figure 38. (Right) Stairstep cracking, from foundation to sill of restroom window, west wall.

ENVELOPE – ROOFING AND WATERPROOFING

ROOFING SYSTEMS

DESCRIPTION

The existing roofing is a modern lightweight ribbed sheet steel with baked enamel finish, red on top and white on the bottom. It was installed in 1996 on oriented strand board (OSB) sheets that were nailed to the top of the original spaced 1x roofing boards. The original roof boards, while spaced over the attic, were installed with tight joints at the open eaves where their undersides were exposed to view. Many nails from this new metal roof penetrate through the eave sheathing boards (shiners) creating an unsightly condition.

This roofing material was also used to roof the belfry and cover the openings in its vertical sides to preclude animal and water entry.

The roofing that was removed prior to installation of the current roof was unpainted galvanized corrugated sheet steel. It was a typical industrial style roof applied in 26" wide x 10'-0" long panels. It was apparently the second roof on the building. As evidenced by the remnants of wood shingles on top of the ceiling in the attic, the first roof was wood shingle. One good retrieved wood shingle sample was 15" long with a 5" to 5 ¼" weather exposure.

EVALUATION

This metal roof is a medium quality system and is not ideal for this building largely because of its gross detailing and light weight. However, it is in place with only occasional minor leaking.[14] It is approximately 10 years old and may have another 10 years of life.

Closing up the belfry openings was done to keep bats, birds and moisture from entering the building. However, since the belfry is open to the Entry roof below and the Entry roof communicates with the Hall roof, this is the only place currently that provides ventilation to those above-ceiling spaces. Also, it causes the building to appear closed and inactive, is not a recommended preservation measure and is counterintuitive to the eye.

One expects to either see the bell or see louvers or some other detail that obviously lets sound out. Bill Parks states that there were louvers in the openings of the bell tower when he was a student and that they were removed when the current metal roof was installed. He is not able to say for certain what size they were. During field work at the building, one of the metal panels was removed to provide for inspection. No physical evidence of louvers was found.

[14] Ceiling water stains at the furnace flue penetration were pointed out to Bill Parks during a site visit and he promptly fixed the roof leak with sealant. He observed that the building has experienced few leaks since installation of the new metal roof.

TREATMENT RECOMMENDATIONS

- Inspect roof regularly through time. When it begins to fail, it should be removed and a new fire retardant wood shingle roof installed. The belfry should be reroofed similarly at the same time.
- Install new wood louvers on the belfry. Sizes and configurations should be gleaned from historic schools of the period that have extant historic louvers in bell towers. Install 1/4-inch mesh hardware cloth behind the louvers, secured on the interior with a 1" frame to prevent sagging.

SHEET METAL FLASHING

DESCRIPTION

All existing flashings are proprietary as part of the roofing system package and are the same material and color as the roofing.

Figure 38. Roof flashing around brick pilaster, north side of entry. Note crude fit and non-integrated work. Interfaces depend on sealants to keep water out.

EVALUATION

The flashings also are the same gauge of lightweight steel as the roof. They are gross in nature, i.e., they are oversized for their purpose making for quick installation on the one hand, but for loose fit on the other. The cap flashings at the parapet are not integrated into the brick joints, nor are they saw-cut into the masonry using reglets as in traditional or higher quality construction. Rather they depend on sealant to keep moisture from penetrating between the metal and masonry and getting under the roofing. The flashing installation is slipshod and marginally effective.

TREATMENT RECOMMENDATIONS

- Check flashing sealants annually and remove and replace deteriorated sealant.
- Annually inspect underside of roof sheathing and ceilings at roof penetrations for evidence of moisture, i.e., staining.
- Replace flashings when replacing the roof. Use heavy duty flashing that is compatible with the new roof system and is fully and appropriately integrated with the masonry and effective in flashing the roof penetrations. Use Sheet Metal Contractor's National Association (SMCNA) detailing.

DRAINAGE SYSTEM, GUTTERS AND DOWNSPOUTS

DESCRIPTION

There are no gutters or downspouts. Roof runoff drains directly from the eave of the roof to the ground.

EVALUATION

While gutters and downspouts could be installed, they will not be needed after the perimeter is re-graded. The nominally 24" roof overhang is sufficient to keep roof runoff water and splash away from the building foundation.

TREATMENT RECOMMENDATIONS

None.

WINDOWS AND DOORS

DOORS

DESCRIPTION

There is one set of double-leaf flush face exterior doors at the entrance to the building (Figure 38.) Each leaf is 2'-11" x 6'-7". Each has a tall, narrow pane of wire glass with another smaller pane above that appears to be of 1950s vintage, consistent with the time the building became a community center.

The door frame is a simple 1x member set in the center of the brick jambs and head, more than likely anchored to a piece of wood blocking recessed in the brick masonry at the head and jambs. It has a stop and a small quarter round trim piece on the exterior side where the wood meets the brick and similar miscellaneous trim on the interior. The inside surfaces are painted out with the walls, the exterior surfaces are finished natural. There is no threshold.

There are four interior swinging single-leaf doors, all raised five-panel doors, one of which is shown in Figure 40 below. A door 2'-11 ¼" x 6'-11" leads to the classroom at each end of the hallway, and there is a 29" x 6'-5" door to each restroom at each end of the hallway. These four doors are painted the same color as the walls.

At the center of the building is a divider made of six raised 6-panel and two raised 3-panel doors that can be closed to make two classrooms (Figure 40). The doors are suspended from a suspended track built in to the header above, along which they move. These are varnished and possibly stained. Each of he six 6-panel doors measure 2"-10" x 9'-0". The two at each end, each with three vertically arranged panels, are hinged at the wall, and measure 1'-4 ¾" x 9' 0".

Figure 39. Entrance doors. Looking east.

Figure 40. Divider doors between the two classrooms. Looking toward north classroom.

Figure 41. (left) Door knob and plate. This knob has an embossed decorative pattern.

Figure 42. (right) Door leading from south classroom to hall. Typical of the three other 5-panel doors in the school. Facing west.

EVALUATION

The entry doors are in **fair to poor** condition. The flush face has splintered in places at top and bottom, the weather-stripping is loose at the bottom, and there are numerous holes and dents in the faces of the doors. While they are serviceable, they are quite deteriorated. They are hung on flush overlay hinges with screws on the exterior face of the door, making them vulnerable to unauthorized entry. Vandalism has been an on-going problem, due in part to lack of proximity of local residences and other occupied buildings. .Additionally, these doors are inappropriate to the building's character.

The door frame is in **fair** condition.

All the interior doors are shabby and are in need of cleaning up and/or refinishing, but they are in **good to fair** condition. It appears as if there was an attempt to refinish doors in the divider panel, which was abandoned - possibly because it was less than successful. The leaf doors swing easily, but the divider panels move along their track with considerable effort because the track is in **poor** condition and the door bottoms scrape on the flooring. The roller bearings supporting the door assembly are disintegrating, with small cylindrical rollers from the bearing assemblies regularly found on the floor in the vicinity of the doors.

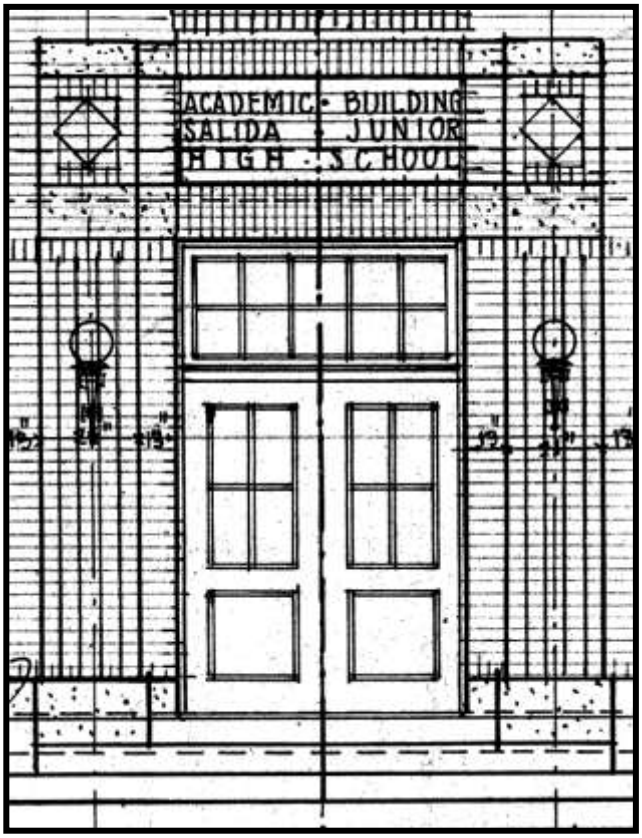


Figure 43. Drawing of original entry doors, Kesner Junior High School, Salida.

TREATMENT RECOMMENDATIONS

- Replace the entry doors with a pair of doors more appropriate to the vintage of the building. Use metal doors similar in appearance to those used in the original construction of Kesner Jr. High in Salida, a 1922 school building (Figure 43). One leaf should have an integral astragal and incorporate a head and footbolt (see Hardware). They should be hung with concealed mortise type hinges on either the existing wood frame or a new wood or metal frame.
- Install new accessible threshold.
- Assuming the currently painted interior doors originally were all varnished wood instead of painted, they should be stripped and refinished. This would remove the many layers of paint and make them more durable and clean-able. The divider panels should also be stripped and refinished. Qualified tradesman should do this work. Do not strip by dipping. Refinish all 6 door faces.
- Rehabilitate divider panel track. Care must be taken not to damage the trim around the divider while this is being done. If, after the roller support system is rehabilitated, the doors still bind on the floor, the door bottoms can be trimmed.

WINDOWS

DESCRIPTION

The windows in Coaldale are single glazed steel frame windows. Steel windows became popular after the turn of the 20th century, and remained popular into the 1960s and 1970s when energy considerations became paramount. With their high rates of heat conductance through the muntins and less than ideal weather stripping, steel windows fell out of use in colder climates after the energy crisis of the mid-1970s. As can be seen at Coaldale, they are very durable and with their thin muntins, provide a high ratio of light to solid in the window opening.

Steel window nomenclature is unique and by the 1950s or perhaps earlier, the Steel Window Institute standardized sizes and nomenclature. The single type of operable steel window sash used in the Coaldale School is called "pivoted sash." A pivoted window is hinged horizontally in the center of the operable sash, so the bottom half swings outward and the top swings inward into the room—a sort of combination awning-hopper--an arrangement that assures any precipitation will drain to the outside. The sash openings are adjusted to various open positions by means of a "stay bar," which also acts as a locking bar. Each operating sash is made up of 2 rows of 3 lights, one row over the other with the horizontal center muntin being the pivot.

Through time, the proportions of the individual lights varied from a vertical rectangle to a more horizontal rectangle, but occasionally they were square. The variations were a function of changing architectural styles and public taste. At Coaldale all window lights, whether in operating or fixed sash, are of the vertical rectangle type, 12 ½" wide by 18 ½" high, from approximate centerline to centerline of muntin bars.

There are eight steel windows on each of the west and east facades with no windows in the north and south facades. Among these 16 windows there are three sizes of window openings, however, the 6 light operating pivoted sash is the primary building block for all.

In the long hallway adjacent to either side of the entry door, there are 6 window openings with an additional opening at each end, the end windows being in the restrooms. Each 3'-2 ½" wide by 3'-0" high restroom window is comprised entirely of a single 6 light pivoted sash as described above (Figure 46).

All of the 6 hall windows are 3'-2 ½" wide by 4'-7 ½" high. Two of these are made up of a 6 light pivoted sash above a single row of 3 fixed lights (Figure 45). The other four are 9 light fixed sash of the same size and configuration.

Along the east facade in the classrooms there are eight pivoted windows, 5'-3 1/8" wide by 6'-1" high, each 5 lights wide by 4 lights high. The operable sash, the basic building block, is a 3 light wide by 2 light high section in the center of the fabricated assembly (Figures 47 & 48).

There is no window trim, either interior or exterior.

EVALUATION

Overall, the windows are in **good to fair** condition. There are a few cracked panes and at least one B-B gun-shot pane. In several places, the glazing compound is cracking and the paint is

and blistering, mostly due to condensation on the inside of the windows. As one might expect, it is most pronounced on the horizontal members, where moisture collects on upward facing surfaces. the glazing compound has sagged and/or was sloppily applied in some places.

Figure 44. Window putty, east wall. Poor condition.

On the exterior, paint has failed in spotty locations resulting in rusting of the exposed steel sash. There is no caulking between the metal sash member and the brick masonry at the jambs allowing moisture and cold air into the masonry wall. The interface between the operable and fixed sashes is metal on metal, allowing some air, and potentially, moisture infiltration, as well.

Figure 45. Hall window, west façade, looking southeast. The upper two rows of lights are operable as a

Figure 46. Restroom window, west façade. Entire window is operable as a pivoted sash.

Figure 47. Window, east façade with pivoted sash in open position

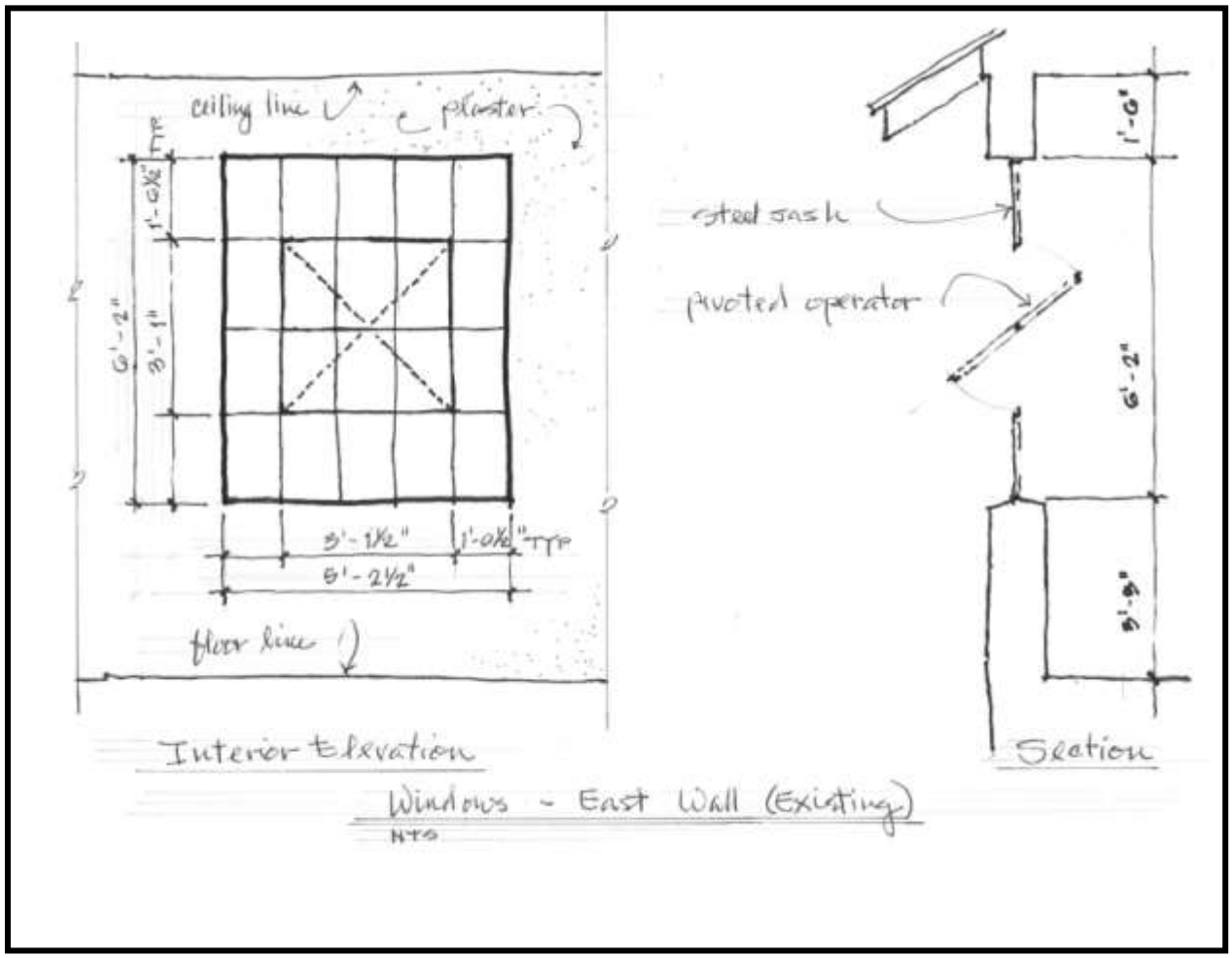


Figure 48. Windows, east wall (existing).

Treatment REcommendations

- Caulk exterior window jambs.
- Replace broken glass.
- Replace sagged, rough and deteriorated glazing compound.
- Scrape and sand smooth areas where paint has failed and steel sash is rusting.
- Paint steel frames both operable and fixed.
- Paint window hardware.
- Install thin bulb or felt type weather-stripping at all operable sash.
- Install interior storm windows throughout to improve energy efficiency and increase comfort level of users.

HARDWARE

DESCRIPTION

The north leaf (inactive leaf) of the pair of entry doors is equipped with an astragal, head and foot bolts and a latchplate. The south leaf (active leaf) has a latch set with a brass knob and rosette. A night latch has been installed above the latchset. A push plate was formerly installed on the inactive leaf but only its ghost remains. The inactive leaf was bored for a latchset somewhat lower than the existinng latching hardware, but if it was installed it is now missing. On the exterior side of the doors a heavy-duty hasp now serves as a locking device. There are wood plates under the latchset and the night latch, apparently installed to cover up damage from vandalism.

The four interior doors have brass knobs on rectangular brass faceplates measuring 2 ¼" x 7". All have keyholes for skeleton keys. The knob on the door from the hall to the south classroom has a decorative pattern. (Figure 49). The door to the north classroom has a small closer.

Figure 49. Decorative doorknob from hall to south classroom.

EVALUATION

- The exterior hardware is in **fair to poor** condition. It is of relatively recent vintage and is not commercial or institutional quality.
- The interior hardware is in **fair** condition. The locksets operate reasonably well, are original to the building, and contribute to its character.

TREATMENT RECOMMENDATIONS

At new exterior doors:
- Replace exterior latchset with a plain lockset with lever handles inside and out.
- Install new deadbolt above the new lockset.
- Install heavy-duty head and footbolts.
- Install closers both leaves.
- Install new threshold
- Rehabilitate and lubricate interior hardware.

TRIM

DESCRIPTION

There is very little trim in this building. The most elaborate trim is the varnished wood frame around the room divider. The horizontal top piece, the head, has a piece of cap molding along the top, and a bead along the bottom. The vertical elements are plain.

There is a 1x8 painted base and shoe in the classroom areas and painted wood trim around the chalkboards

EVALUATION

The trim is in **good** condition.

TREATMENT RECOMMENDATIONS

It is likely that the baseboard was originally varnished; however, it is now painted and no attempt should be made to return it to its original condition/color.

INTERIOR FINISHES

WALL FINISH MATERIALS

DESCRIPTION

Walls throughout the building are lightly stipple-textured hard plaster, applied ¾" thick over masonry. The exception to this is in the north restroom, where all the walls were furred out to provide insulation. These walls are finished with painted drywall.

All walls except in the south restroom are painted with cream-colored paint. The interior was painted approximately 15 to 20 years ago, perhaps between 1985 and 1990.[15]
The south restroom is painted light green.

The wall finish is penetrated by attachments such as surface-mounted electrical and gas system elements, historic and contemporary blackboards, cabinetry, baseboards, historic coat racks in the hallway, and framed pictures. There is no evidence of a picture mould. At each side of the west end of the center dividing wall is a stovepipe hole. Both are now covered with sheet metal. A propane heater vent penetrates the north wall of the north restroom.

The walls in the alcove behind the wood stove have been made fire resistant with cement board covered by metal plates. These plates are painted with fire retardant paint the same cream color as the walls.

EVALUATION

All wall finishes are in **good to fair** condition. Some of the more serious cracks in the masonry walls have telegraphed through to the interior. These typically are from the window sills downward or the window heads upward.

Figure 50. Diagonal crack from sill down to left in North Classroom. North end of sill, north window, east wall. (See Figure 17 for same crack on exterior.)

ill Parks, personal communication, 09-06-06.

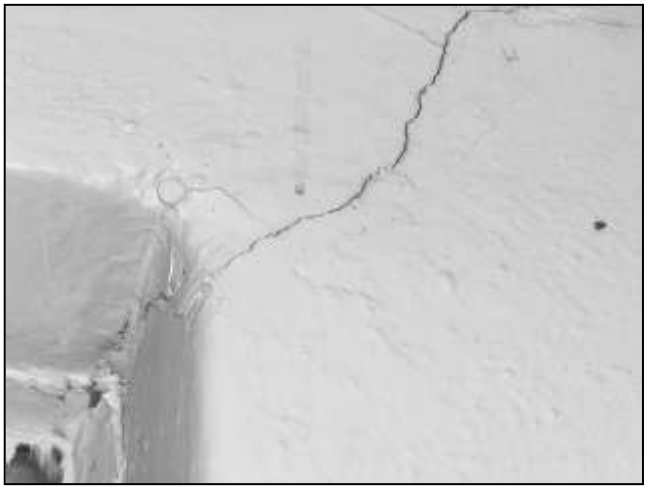


Figure 51. Diagonal crack at window head in Hall. North window, west wall.

Figure 52. Vertical crack in window sill, west wall in Hall.

TREATMENT RECOMMENDATIONS

- After it has been determined by the crack monitoring program whether wall movement is on going and the walls are stabilized, plow out the cracks to a "V" shape and patch the cracks with patching material compatible with existing plaster. Paint.
- Continue routine maintenance being observant to cracks opening up. Avoid placing additional holes in the walls.

CEILING FINISH MATERIALS

DESCRIPTION

Ceilings in the classrooms are finished the same as the walls, with very lightly sand-textured to stipple-textured plaster. This plaster is applied to wood lath. The ceiling height is 10’-11”.

Those in the hallway and north restroom are taped drywall, and they are lower than the classroom ceilings, at 8’- 8 ¼”. The ceiling in the south restroom is plywood. It is painted the same light green as the walls. There are no battens along the joints between sheets of plywood. All the rest of the ceilings are painted with cream-colored paint.

Ceilings are penetrated for electrical fixtures. In the classrooms there are eight fluorescent lights with two hangers each, and two ceiling fans. There is an electric light fixture in each bathroom. There are two fluorescent light fixtures, one toward each end of the hallway, attached directly to the ceiling. Electricity was installed in the school in 1948. Apparently the existing light fixtures

were installed over the holes for the original wiring, as there is no evidence of the original wiring on the ceiling.

A gas line is screwed to the ceiling toward the west wall of the south classroom, traveling from the wall to the propane furnace. A metal flue for the wood stove penetrates the ceiling in the northwest corner of the south classroom, and likewise a flue for the propane furnace penetrates the ceiling in the southwest corner of the north classroom. The stage curtain is suspended from 5 eyehooks screwed into the ceiling.

EVALUATION

- Overall, the ceilings are in **good** condition.
- The classroom ceilings exhibit numerous patched cracks that run predominantly north-south, one of which is fairly pronounced. This is in the direction of the wood lath to which the plaster is attached. As noted under the Ceiling Framing section, cracking is due to ceiling joist movement, which may be a continuing phenomenon. None of these cracks is recent.
- Hallway and restroom ceilings are in **good** condition and exhibit no cracking.
- However, there is water damage where the furnace vent in the southwest corner of the north classroom penetrates the ceiling, at which point the condition of the ceiling is **fair.**

TREATMENT RECOMMENDATIONS

- Repair cracks in ceiling plaster, paint.
- Monitor ceilings for new cracks.
- At furnace flue penetration, scrape loose paint and remove any deteriorated plaster. Replaster to match adjacent area. Paint.

FLOOR FINISH MATERIALS

DESCRIPTION

The classrooms are floored with soft wood strip flooring on diagonal 1x8 subfloor, and the hallway and restrooms have concrete floors. None of these is visible.

Floors in the classrooms and hallway are covered with short-napped carpet, glued to linoleum or vinyl which is itself glued to the wood. Floors in the restrooms and kitchen are vinyl sheet goods. The stage is floored with 12” square vinyl tiles, possibly self-adhesive.

At some point in the past, vandals poured paint on the linoleum and it would have been difficult to remove. At that point, the carpet was installed. The carpet is edged with metal. There is no edging at the bathroom thresholds.

Along the west wall beneath the furnace and heater is an area floored with bricks. This may be original.

EVALUATION

There is no evidence of springiness or deflection in the wood floor. The carpet and vinyl are in **good to fair** condition. The condition of the wood floor is **unknown,** but it is assumed to be

structurally sound. The concrete floor in the hallway is also assumed to be in **good** condition since there is no apparent heaving or moisture.

TREATMENT RECOMMENDATIONS

- The classroom floor should be monitored for any springiness or deflection that would indicate a problem. Otherwise, only routine maintenance is needed.
- Removing the vinyl and carpet from the wood floors in the classrooms is optional. However, this would restore these rooms more closely to their historic appearance.

TRIM AND BUILT-INS

DESCRIPTION

There is no ceiling trim. Wall trim in the classrooms is limited to a wood baseboard, 7 ½" high and ¾" thick. Where there is no carpet, there is ¾" cove mold (kitchen, stage, restrooms) or ¾" quarter-round molding (at brick beneath furnace and heaters.)

There are numerous built-ins

Kitchen

Figure 53. Kitchen. Facing north end of classroom.

Along the north wall of the north classroom is a kitchen area, with drawers and cabinets topped with an off-white Formica counter top. A sink is located just to the left of center in this counter. The casework is plywood, stained a honey color. Hardware on these is a mixture of “streamline” or “colonial” styles, which would be appropriate for hardware installed when the kitchen was created in 1959.

Wall-hung cabinets also built of plywood and stained a honey color are attached to the wall above this counter. Over the sink is a decorative panel hiding a work light. Above this is a trophy case with two glass doors. The cabinets were installed over blackboards, which are discussed below.

The kitchen area cabinets are 2’ deep and 15’ long. The Formica counter top is pre-made, with an integral back splash and a curved front lip. It overhangs the cabinets by one inch.

The upper cabinets are 12” deep and total nominally 15’ in length. The set to the left of the sink, with 3 doors, extends 4’-10 ½”. The set to the right, with 5 doors, runs 7’-8 ½”. The lighted space over the sink is 2’-5 ½” wide.

At 35” south of the kitchen counter is a 17’-5” long island counter used as a serving bar that was installed in 1978. This is also made of plywood stained honey color, with cabinet doors on the north side and a plain south side. This, too, is covered with off-white Formica that overhangs all edges by approximately one inch, and it is 2’-0” deep.

These cabinets are used to store staple ingredients such as coffee, sugar, and creamer, and cooking and serving items.

Completing the kitchen are a refrigerator, located at the east end of the work area, a microwave oven sitting on the east end of the work area counter, and a gas stove at the west end. An electric water heater stands in the northwest corner of the space.

Figure 54. Teachers' cabinet, east wall of north classroom, looking east.

Teachers’ Cabinets

Flanking the east end of the central dividing wall are two teacher’s cabinets, one in each classroom. They are each 12” deep, 2’ 7-3/4” wide, and 7’ 6-1/4” tall. They are topped by a simple crown molding, with a smaller applied bead surrounding the cabinet at the tops of the doors. The doors are “Dutch” doors, with the top leaf taller than the bottom. The two halves of the door to the north cabinet have been attached to each other, so they swing together. Those on the south cabinet still swing independently. Both cabinets have *ad hoc*

replacement latches. All brass hinges appear to be original.

These contain miscellaneous items, some of which should be preserved. For example, there are several songbooks called “The Patron” and several small “Manual: Subordinate Grange” all with handwritten inscriptions “Property of Coaldale Cotopaxi Grange # 397.” Also found was a wood ballot box with white and black marbles as ballots, a gavel and base, and a small metal box containing miniature gardening tools. What appear to be ceremonial sashes are also in one of the cabinets, and "shepherd's hooks" that probably are associated with the Order of the Patrons of Husbandry, which is the formal title of The Grange.

An inventory of these items is needed. Perhaps one of the teacher cabinets could be set aside to store these historic items, which would be kept organized and dusted. Access to them might be limited if this is felt to be necessary. Selected items could be used for a small display, perhaps in a case where they would be visible yet protected. If there are no examples of these objects in a local museum, perhaps one of each when there are duplicates could be donated to be part of the permanent collection.

Stage

The stage is a simple platform that extends across the full width of the south end of the south classroom. It is raised 1'-3 ¼" above the floor, and is 7'-11 ½" deep. As with those in most of the rest of the room, the blackboards were left on the walls, above the stage platform, but were painted over.

On the stage is a piano, and a number of other items are stored toward the back corners. Hospital-style screens, metal frames on wheels with gathered fabric panels, serve as “wings”, and also conceal some of the stored items.

The stage curtain is suspended above the north edge of the stage from five eyes screwed into the ceiling. There is a black velvet pleated valance with gold fringe along the bottom 4”. The curtain itself is rolled up behind this valance, raised and lowered from the west end of the stage by cords on pulleys.

Based on information recently collected, this curtain apparently is the second, and was made in the 1960s, possibly by the Grange. The first is said to have been "folded up and put away" in an undetermined location.[16]

Blackboards

There are blackboards across almost the entire south and north ends of the classrooms. On the north wall, the kitchen counter and wall cabinets obscure them. These, as well as the ones on the south wall, which are on the stage, are painted the wall color. There are also blackboards on most of the available space on the west wall, even on the stage where the ones lining the south wall turn the corner. None exist on the east (window) wall. One on the west wall just north of the north door to the hall has been covered with cork tiles. Tapping the blackboards indicates they are Masonite or equivalent. Two blackboards that are still functional as blackboards are located on the west wall, one in each room. The one in the north classroom appears to be recent, as it is surrounded by aluminum and there is an aluminum chalk tray along the bottom. The one in

[16] Donna Nicholas-Griesel, Personal Communication, January 2007.

the south classroom appears to be original. Although this could not be verified, it could be a Hyloplate type blackboard, common in country schools in the area at this period. (See Materials Analysis).

Figure 55. Stage curtain, Looking south.

Cloakroom

The hallway served as the cloakroom. On each side of the alcove where the water fountain was formerly located are benches 9'-8" long, 11 ½" high and 11" deep where students could put their boots or shoes. At 4'-5 ¼" high on the wall is a board 4 1/8" x ¾" wide extending the length of the bench, with brass hooks, now painted, arranged at irregular intervals. Above this is another similar board at 5'-11 ¾" high with hooks manufactured of twisted wire. This may be a later addition, or perhaps it is contemporary with the bottom coat rack, and less substantial and therefore less expensive hooks were used for what might have been intended for hats rather than for coats.

EVALUATION

All the built-ins are in **good to fair** condition and operable.

TREATMENT RECOMMENDATIONS

- Suitable reproduction replacement latches compatible with the hinges should be found for the teacher's cabinets.
- Artifacts in the cabinets should be kept dusted and stored in a clean and organized fashion. An exhibit of some of these objects should be developed, to interpret the building's role as a Grange hall.
- Retain all blackboards in place. Do not paint any that have not already been painted.

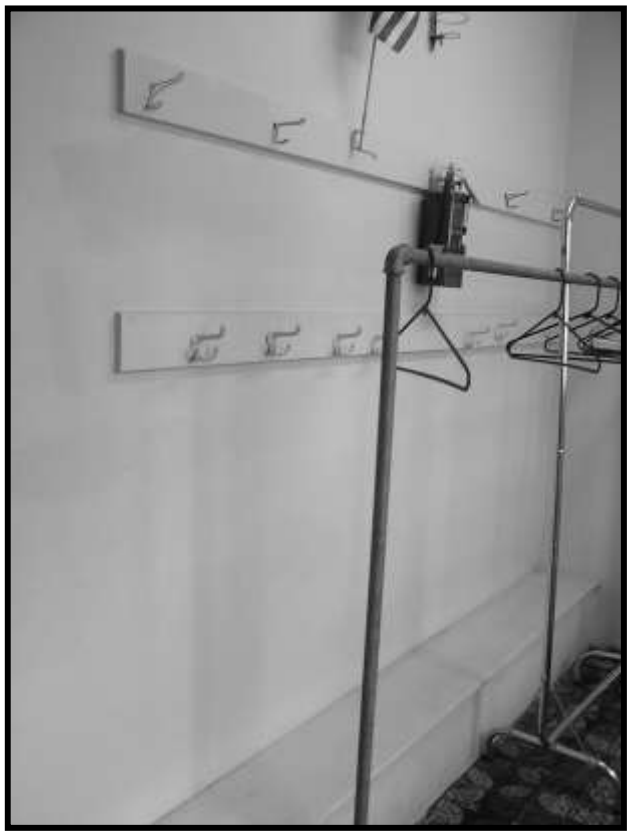


Figure 56. Hall, north end. Coat hooks with bench below and portable coat racks.

Figure 57. Alcove/niche with arched head centered on entry door in east Hall wall.

Figure 58. Heavier coat hook type

Figure 59. Lighter coat hook type

MECHANICAL SYSTEMS

DESCRIPTION

PROPANE SERVICE

Propane gas service is from a tank located about 30 feet off the northeast corner of the building adjacent to the old woodshed. An underground gas line leads west along the north wall of the building and enters the building approximately 10 feet from the northwest corner. After entering the crawl space it branches to serve the furnace, restroom heater and kitchen range.

HEATING AND COOKING

There is a stove niche along the west wall in both the north and south classrooms. A wood stove occupies the niche in the south room and a propane forced air heater occupies the niche in the north room. Both stoves vent vertically where their stove pipes penetrate the ceiling and roof to daylight. The wood stove vent extends approximately 7 feet above the roof and the gas stove vent extends about 3 feet above the roof. Both are terminated with appropriate metal caps. Sheet metal covers the chimney stovepipe holes in the old chimney that served former stoves in these niches.

There is a small propane space heater in the north restroom. The vent penetrates the north brick wall and extends upward penetrating the Hall roof eave as well as the main roof eave above. It is terminated with a cap about 12 to15 inches above the main roof eave.

There is a residential sized kitchen gas range at the west end of the kitchen counter. There are two ceiling fans, one in each classroom.

Figure 60. Propane fired forced air heater in niche in North Classroom.

Figure 61. Wood stove in niche in South Classroom.

INSULATION

The attic is insulated with approximately 3 to 4 inches of blown-in cellulose insulation which should provide R-3.70 per inch thickness or a total of about R-11.1 to R-14.8. There is no insulation in the walls, but the brick alone is worth R-4.0 per 4 inch thickness or about R-9 total. There is no other insulation.

PLUMBING

Water service is from a well located near the firehouse that also serves the clinic. It enters the community building near the northwest corner. It is classified as a commercial well. Plumbing in the building is limited to the two restrooms and the sink in the kitchen counter along the north wall.

Restroom waste plumbing is old and consists of steel supply piping and exposed cast iron soil pipes and vents. The south restroom waste vent penetrates the roof directly above the former restroom. There is a waste vent penetrating through the Hall roof in front of the chimney which apparently is from the north restroom. A third waste vent penetrates the north brick wall opposite the kitchen sink. It extends upward for about for about 8 feet where it terminates. It is attached to the wall near its top.

Apparently a waste line serving the north restroom and kitchen runs along the north wall of the building and goes to a septic tank located in the open space between the north wall of the school and the shed. Leach lines fan out from the tank eastward to the open area well to the east of the building**.** There is another (abandoned) waste line that went to a septic tank located to the west of the building beyond the swing set that formerly served the urinal in the south (boy's) restroom.[17] Septic system evaluation is beyond the scope of this document.

The toilet fixtures were removed from the south restroom some time ago when it was converted into a storeroom.

Figure 62. Plumbing in crawl space, near crawl space entry.

Figure 63. Cast iron waste vent in Storage Room (former restroom.)

[17] Bill Parks, Personal Communication, August 2006.

EVALUATION

Propane Service

The propane service is adequate to serve the current needs of the building.

Heating and Cooking

The current heating system is inadequate. The wood stove, while providing good point source heat when operating, must be constantly tended and cannot be kept going on a full time basis. The gas furnace is not ducted and is, therefore, also a point source of heat and can be set to a low setting to provide heat on a 24 hour basis sufficient to keep pipes in the kitchen from freezing. It is equipped with a fan which blows heat into the room, but does not distribute it evenly nor does it put the heat on the exterior walls under the windows where it is most needed. The fan noise makes use of the building difficult as it seriously affects attendees ability to hear one another or a program.

The cook stove is adequate to serve the needs of the community center to warm foods and boil water for various purposes.

Air conditioning.

Air conditioning is not needed. There are too few uncomfortably warm days in the year to warrant an air conditioning system. The thick brick building walls provide for a lag in temperature swings such that daytime users experience cool rooms. Additional attic insulation as recommended below will enhance this effect. Windows on both long building sides provide good cross ventilation and two ceiling fans provide air mixing when needed.

Insulation

Insulation is inadequate.

Plumbing

One restroom is not adequate to serve the needs of the occupant load. A minimum of one additional restroom is needed. The kitchen sink serves adequately for events preparation and cleanup.

There are no drinking fountains, but the kitchen sink can be continued in use in place of the required drinking fountain.

TREATMENT RECOMMENDATIONS

Propane Service

No recommendations

Heating and Cooking

- Replace the propane furnace with a new quieter system that distributes heat to the entire building. At this time electric baseboard is recommended. The gas-fired furnace and restroom space heater could be kept in place, if desired, for 24 hour minimum heat or in case of an extended power outage.

Information in the following paragraphs was considered in making this recommendation:

A new gas or electric fired furnace with a ducted system would provide adequate heating, even though it would be noisier than a hydronic or electric baseboard system . A 1-hour rated furnace room would be required for such a system and no such space is available in the building. An addition or a separate building would have to be constructed or a portion of the crawl space would have to be further excavated and a 1-hour rated basement space created.

A hydronic baseboard system would provide quiet and even heat, but also would need a 1-hour rated room to house a boiler. A boiler could be gas or electrically fired.

An electric baseboard heating system would provide sufficient heat to keep the building evenly comfortable for its various uses and, zoned properly, it would keep plumbing from freezing in winter without having to heat all spaces unnecessarily. Installation costs for such a system would be comparatively low, but in past years operating costs have not been competitive with gas. Since the building is not in constant use and with gas prices rising dramatically in recent years, electric baseboard heat is likely to be viable.

Electric fired heating apparatus of any kind would lend itself to the installation of a photovoltaic (PV) system. A PV system would not have to be installed at the time of the electrical update, but could be installed at any time in the future. The PV array could be installed to the east of the school building along the north property line toward the fire station and the inverters and controls (and batteries, if needed) could be located in the shed adjacent to the school building or in the fire house. If connected to the power grid, commercial power could be used when necessary and the PV system could reverse feed into the power grid to produce energy credits and probably obviate the need for batteries. Perhaps a joint PV system with the fire department could be effected.

Air conditioning.

No recommendations

Insulation

Install additional insulation in the attic (See Item 38 under Building Code Compliance.).

Plumbing

Re-plumb south restroom to put it back into service. Install new fixtures and finishes. Make accessible. (Please see recommendation under Accessibility Compliance.)

ELECTRICAL SYSTEMS

DESCRIPTION

The electrical service enters the building overhead from a pole located to the northwest of the building. The overhead lines span from the pole to the north end of the east roof overhang, where attached to the eave are 3 insulators on a wood block that provide a building anchorage for the wires. From there, the wiring is looped down to a conduit weatherhead high on the wall up under the eave. The conduit with wiring enters the building about 2'-6" from the northeast building corner and 6'-4" above the finished floor where a panel is surface mounted on the plaster wall. The panel appears to be a 100 amp panel with 12 circuit breakers. The Coaldale Community Building Assn. is responsible for everything on the building side of the pole.

Wiring from the panel to various parts of the building is overhead for lighting and in some cases into the attic, dropping down the wall where necessary to serve a function such as for the furnace. Where it is exposed in the main rooms it is in surface mounted *emt* conduit.

One conduit runs from the panel to a hole through the masonry in the north wall. It is attached to the outside of the north wall and runs west about 20 feet to reenter the building through another hole in the wall to serve a subpanel for the electric water heater. There is another exterior conduit attached to the front wall of the building to the south of the building entry.

Lighting in the classroom areas is a double row of suspended two lamp 6' long fluorescent fixtures running the length of the building. They have no lenses and no baffles or other cut-off mechanisms. They are switched so one switch near each classroom door operates all the lights in that classroom.

There is no fire detection system.

Figure 64. Electric water heater with switch at wall. Located in west end of Kitchen.

Figure 65. Main electric breaker box on north end of east wall, east end of kitchen.

Figure 66. Power pole off the northeast corner of the building. The three lines to the left are the current service lines to the building.

Figure 67. Strip fluorescent lighting. Quilted window curtains at east wall.

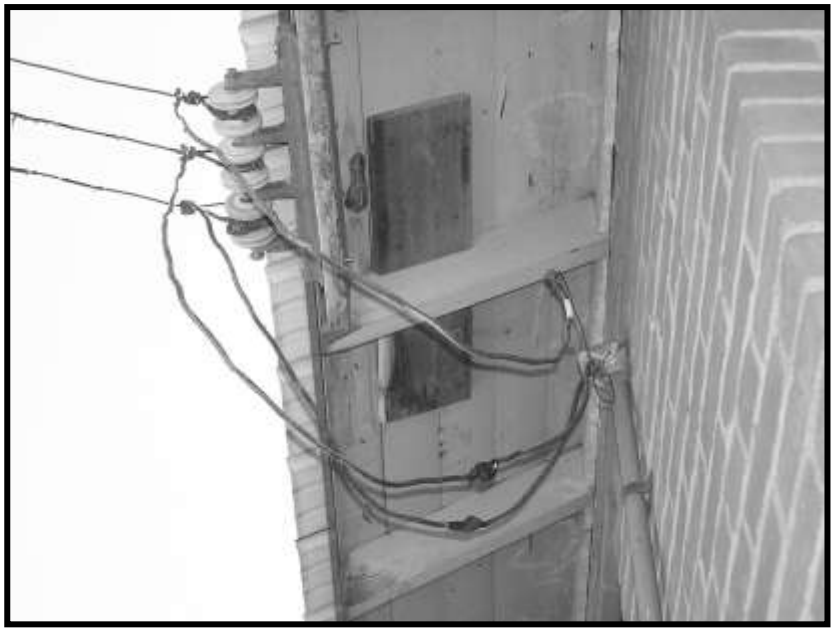


Figure 68. Electric service entry at northeast corner of the building.

EVALUATION

- The service wiring is old, frayed and cracked and potentially dangerous.
- The service and panel are too small for a building of this size and this function.
- Running conduit through masonry walls is not good practice when it could be routed otherwise, such as overhead in the attic or through or above the kitchen cabinets.
- Lighting, while not extremely poor, is inadequate. The fixture layout would be better if it were configured in rows across the rooms rather than along the length of them. The lighting should be more specific to the anticipated tasks and utilize fixtures that eliminate glare. Lighting under the upper cabinets in the kitchen, as well as above the long countertop is needed. Task lighting for the classroom areas should be brighter in lumens and more flexible in switching. Light fixtures should have horizontal cutoff lenses and baffles to direct light down and up rather than out.
- Because the building is unoccupied much of the time a fire on the interior could go undetected. A fire detection system with exterior visible and audible alarms that could alert neighbors would be cost effective.

TREATMENT RECOMMENDATIONS

- Provide new underground service from pole to building.
- Install new 200 amp panel.
- Provide additional wall outlets in the kitchen and east, south (stage) and west walls of the building. Surface mounted wiremold plug strips installed on walls and under upper cabinets is recommended.
- Eliminate exterior conduit by rerouting wiring inside.
- Revise lighting with new fixtures in a scheme designed to correct deficiencies noted above.
- Install a new 220v electric baseboard heating system (see discussion under Heating Systems).
- Consider installing a photovoltaic power system. Tie into grid to run in reverse when excess power is generated.
- Install a fire detection and alarm system consisting of hard-wired smoke detectors connected to interior and exterior audible and visible alarms. Exterior alarms should be placed on the southwest corner and on the east façade of the building. The alarms should be mounted under the eaves suspended from the rafter tails. Wiring should be through the attic spaces. Do not anchor alarm fasteners into the brick masonry.

ANALYSIS AND COMPLIANCE

HAZARDOUS MATERIALS

INTRODUCTION

Testing for lead paint and asbestos is beyond the scope of the Coaldale School HSA project.

It is quite common to find both lead and asbestos in historic buildings. Lead was used in paint to improve its durability and colorfast qualities. Asbestos had proven fire resistive, thermal, and chemical resistance, and high tensile strength properties and was woven into a broad range of building materials from around the 1920s to the 1980s.

The presence of either lead or asbestos in a historic building will increase rehabilitation costs if mitigation is required.

LEAD-CONTAINING PAINT

If paint tests positive for any amount of lead concentration or contamination, mitigation (removal or encapsulation), construction worker personal protection and air monitoring, and disposal of construction waste as hazardous materials may be required.

What triggers the need for mitigation?
OSHA's Lead Standard protects construction workers. Employers are required to provide minimal training for workers and to perform air monitoring to document exposure levels.

HUD and State of Colorado regulations protect building occupants. For instance, a day care center for children will demand a much higher level of mitigation than an Office building, due to the fact that children are more likely to ingest paint and because children are more seriously affected by lead poisoning.

EPA regulations protect the environment and require testing of lead waste pipes so lead will be disposed of properly and won't leach out into water tables.

What levels of mitigation are necessary or required?
While some rehabilitation activities or occupancies will obviate complete paint removal, there are three less-invasive options in other situations:

1. Scrape and sand loose paint (under controlled conditions). Do not use power tools to remove paint from historic building fabric.

2. If the paint surface is in good condition it may be possible to just paint over it.

3. Prohibit welding on or torch cutting of painted metal substrates.

What is implied by "controlled conditions"?
Whether lead-containing paint is being stripped completely or just scraped, the following conditions must be adhered to:

1. Qualified subcontractors who have been trained to do the work and who have undergone medical testing must perform paint removal.

2. Air monitoring by a qualified professional must be in place during the mitigation process.

3. Paint waste must be tested, documented by qualified professionals and disposed of properly.

ASBESTOS

From the 1920s to the 1980s, there were many materials that incorporated asbestos, but among the most common were:

- Fireproofing
- Roofing/flashing materials
- Exterior coating systems (a paint-like coating that usually has a textured surface)
- Asbestos/cement shingles and exterior wall panels (Transite)
- Roofing shingles and shingle siding
- Glazing putty at windows
- Pipe and pipe fitting insulation
- Vinyl sheet and tile flooring
- Plaster
- Construction adhesives
- Building insulation

"Friable" and "non-friable" are the two terms applied to asbestos, with "friable" evoking the most concern and the greatest level of care in removal and disposal. "Friable" means that when the material is disturbed in any way (sawn, moved, removed, cut, etc.), it will introduce asbestos fibers into the air that could be inhaled by unprotected workers and building users. Pipe and building insulation typically fall into this category and therefore require the highest degree of worker protection and controlled handling during the abatement process.

Non-friable materials tend to maintain their compositional integrity during abatement and therefore may not pose the same health risks. Abatement still requires proper methods, monitoring, and disposal to meet EPA, OSHA, and State of Colorado regulations.

It is important to identify all asbestos-containing materials as even non-friable materials may become friable under certain conditions (e.g., if asbestos-containing floor adhesive is sanded.)

SUMMARY

Lead containing paint and asbestos can present health risks to building users and construction workers, can trigger both state and federal hazardous material regulations for control and abatement, and can add significant cost to a rehabilitation project. It is recommended that

hazardous material testing be performed prior to finalizing the rehabilitation or restoration budget. Qualified licensed professionals should execute all testing.

Their findings and recommendations should ultimately be worked into the rehabilitation plans with a word of caution: hazardous material abatement crews are not always sensitive to the issue of preserving historic materials (e.g., scraping lead-based paint may damage the underlying surfaces). Ideally, the General Contractor responsible for the rehabilitation work should perform abatement of hazardous materials on historic, character-defining elements; if not he should watchfully manage any abatement subcontractors.

Please note that there are many other hazardous materials (e.g., radon, petrochemicals, PCBs, etc.) that may affect rehabilitation plans but that discussion is outside the scope of this report. Asbestos and lead-containing paint are the two most commonly found hazardous materials in historic buildings.

MATERIALS ANALYSIS

No materials analysis was done during this phase of the project. See Masonry Walls section for mortar analysis recommendation.

The following information about historic blackboards, adapted from research done for Poncha Springs Town Hall (formerly a school), and Valley View School, both in Chaffee County, is included here due to its relevance to the Coaldale School.

BLACKBOARDS

Schools in the Upper Arkansas River Valley have various types of blackboards. They range from slating painted on plaster walls through slated canvas to Hyloplate to black-finished Masonite, up to today's' "erasable whiteboards." Most schools in this area had Hyloplate blackboards at one point or another during their history. Hyloplate is what seems to have been used at the Coaldale School.

The *Sears, Roebuck & Co. Catalogue* of 1897[18] includes several blackboard items. One is made of Hyloplate, described below. Others are slated paper and cloth "For Blackboard; excellent for any flat Surface." This was sold by the yard, and could be slated on one side or two.

Sears also sold "Liquid Slating for Blackboards."

> Best Alcohol Black Liquid Slating; may be applied to hard finish plaster, paper, boards, or to old blackboards of any kind; does not become greasy, is not easily scratched, does not crack, blister or glaze when applied to suitable surface according to directions which accompany each can, dries in a few minutes, hardens in a day. A gallon will cover about 250 square feel, three coats. Put up in tin cans. Cannot be sent by mail.

Several recipes for "Slating for Blackboards" are found in the 1894 *Manufacturer and Builder.*[19] Directions state:

> The great secret in putting up a good blackboard is to use no oil of any description in any of the coats. If it is a plastered or papered surface you wish to slate, first give it a coat of glue size, then rub it down lightly with fine sandpaper, then give it a coat of shellac varnish and lampblack enough to give it a fair body. If on wood, omit the sizing.

Two coats of any of several recipes for slating should be applied after the above preparation. Some of the ingredients—alcohol, shellac, turpentine, and wood naphtha—make it clear why this flammable product could not be sent by mail.

A 1917 advertising flyer for Hyloplate Blackboard was found at the Poncha Springs School. This touted Hyloplate, manufactured by Columbia School Equipment Works in Morrison, Illinois, as "The Blackboard with the Velvet Writing Surface" and boasts "The Result of Nearly a Third of a Century of Honest Effort to Produce the Best." The text states 32 years, which indicates it

[18] *Sears, Roebuck & Co., Catalogue, 1897.* S.J. Perelman, Ed., Chelsea House Publishers, Philadelphia, 1968.
[19] "Slating for Blackboards" *Manufacturer and Builder, V. 26, Issue 6,* June 1894, at cdl.library.cornell.edu/cgi-bin/moa/moa-cgi?notisid=abs1821

began being manufactured by 1885. It describes the backing as waterproof, made of four layers of wood pulp board cemented together under 40 tons of pressure, then dried and cured by special processes. "The result is a backing that will not bulge, warp, or curl up." There is no description of how the writing surface is applied, but "The writing surface on other blackboards is easily scratched, is brittle and crumbles to powder under hard crayon, or when scratched with the thumbnail."

The Sears catalog lists "Portable Blackboard of Hyloplate, slated both sides; with ash frame; for use on wall, easel or table." Prices range from $2.60 for 2' x 3' to $7.15 for 4' x 6'. With music lines, each is an additional $1.25. These blackboards could also be purchased mounted on self-supporting "hardwood standards" to allow moving them around a room.

A quick search of the internet for "Hyloplate" found seven references. The most interesting is the report of the Chief Inspector of Schools on what an "average" school in Alberta. Canada, was like in 1937.[20] The overall description is consistent with what is known about rural one-room schools in Colorado. The report states, "The blackboard is of Hyloplate, and is in fairly good condition."

A reference to "Hyloplate blackboard" was found on a Clemsen University website about Fants Grove School[21] built in 1902 in Anderson County, South Carolina. This is now an archaeological site.

When the Rose Bud School in White County, Arkansas, opened in 1918, "Hyloplate blackboards are used and there are single desks and a teacher's desk in each room."[22]
A History of the Ste. Agathe Intermediate School from 1904 to 1936 includes in its description of the many improvements made in this Canadian Catholic school between 1914 and 1918 included Hyloplate blackboards.[23]

Montessori Education in Australia and New Zealand—The Queensland Experience by Dr. Dan O'Donnell[24] contains the following description of a New Zealand school around 1917. "Encircling each room was a continuous blackboard (a Hyloplate) for the use of the children or teacher, while above the blackboard the walls were adorned with didactic pictures and works of art (copies from famous artists)."

"The Homeroom," a website for teachers and teaching in British Columbia, Canada includes a number of historical accounts.[25] One provides a list of "Necessary equipment and supplies for a new school - to be purchased by the board of school trustees" from 1936. The list includes:

120 sq. ft. Hyloplate Blackboard with moulding and chalk trough.
1 Blackboard Pointer
1 box Coloured Chalk (half-gross).
1 box White Chalk.
½ doz. Blackboard Erasers.

[20] http://www.quasar.ualberta.ca/css/Css_35_3/FTdocuments_in_the_classroom.htm
[21] www.clemson.edu/trails/history/fantsgrove.html
[22] www.geocities.com/Heartland/Meadows/1844/rosebud.html
[23] www.magma.ca/~gtkacz/saahist.htm
[24] www.aare.edu.au/96pap/odon96.009
[25] www.mala.bc.ca/homeroom/Content/TopicsPrograms/2001/HEALTH36/health1.htm

Canvas was also used as a writing surface, presumably after being coated with some sort of hard finish. *A History of Dickinson County Schools (from a book written in 1893)*[26] states that, in this Kansas county, "Each district now owns a comfortable frame, brick or stone building, fitted out with patent desks, and provided with excellent slate, canvas, Hyloplate or native stucco-plaster blackboards."

[26] skyways.lib.ks.us/genweb/education/1893book/dickinson.html

ZONING CODE COMPLIANCE

The building has been used as a Community Center since the 1950s. Since there has been no change in use, there are no zoning issues.

BUILDING CODE COMPLIANCE

INTRODUCTION

The Colorado Historical Society has included a code compliance review in their Historic Structure Assessment Outline to assure that the subject structure can be used for (or continue to be used for) the purpose it is intended without compromise to the integrity of the resource. This is particularly important when a historic building is to be converted to a new use and rehabilitation for the new use could require destruction of the character defining elements of the building

The proposed program for the Coaldale School/Community Center Building does not constitute a change in use. While no longer in use as a school, it is and has been for many years, used as a community center with kitchen.

The code review will assess the capability of the building, in light of current building codes, to continue to provide for these uses and, if necessary, suggest use or load limitations based on preservation of character defining features. All applicable code provisions have not been cited, only those in which the building appears to be deficient and/or those that will provide guidance to the community in use and operation of the facility.

The project architects of all future project(s) on this building should consult with the building official and fire official early in the design process for interpretations allowed under the code (edition in force at the time) and work with these officials to develop solutions that provide a high level of health and life safety and at the same time, preserve the integrity of the historic building and site.

It should also be noted that building and fire codes establish minimum requirements. The owners/operators of facilities must determine areas where prudence suggests exceeding these minimums for health, life safety, building protection or comfort of occupants.

BASIC DATA

Code Authority: Fremont County Building and Zoning Division

Building Official:
Michael Cox, Chief Building Official, Fremont County
615 Macon Ave. Rm. 212
Canon City, CO. 81212
719-276-7460
719-276-7461 fax
www.fremontco.com

Fire Official:
John Walker, Fire Chief,
Coaldale Fire Department,
Deer Mountain Fire Protection District
719-942-3687

Building Code: International Building Code (IBC), 2003 Edition

BUILDING CODE REQUIREMENTS

SPACE	AREA (sq. ft.)
Classrooms (Assembly areas)	1174
Kitchen	59 net (185 total including counters)
Stage-Platform	198
Entry and Hall	336
Restroom	61
Storage	61
Total area	2014

Construction Type: TYPE III-B

Occupancy Group: Group A-3

303.1 Assembly Group A. Assembly Group A occupancy includes, among others, the use of a building or structure, or a portion thereof, for the gathering together of persons for purposes such as civic, social or religious functions, recreation, food or drink consumption or awaiting transportation. A room or space used for assembly purposes by less than 50 persons and accessory to another occupancy, shall be included as part of that occupancy. Assembly occupancies shall include the following:...

A-3 Assembly uses intended for worship, recreation or amusement and other assembly uses not classified elsewhere in Group A, including, but not limited to**...Community Halls...**

Specific code requirements by space. The table below is not exhaustively inclusive and the verbiage is not, in every citation, verbatim from the code. Note Items 01 and 02, which under certain conditions, allow the potential for less than strict compliance with some code provisions.

Item	Description	Code Reference
	GENERAL	
01	**Alterations and repairs.** An existing building or portion thereof, which does not comply with the requirements of this code for new construction shall not be altered or repaired in such a manner that results in the building being less safe or sanitary than such building is currently. If, in the alteration or repair, the current level of safety or sanitation is to be reduced, the portion altered or repaired shall conform to the requirements of Chapters 2 through 12 and 14 through 33. (Chapter 13 is Energy Efficiency. See Items 36, 37, 38.)	Section 3409.2.4

Item	Description	Code Reference
02	**Historic buildings.** The provisions of this code relating to the construction, repair, alteration, addition, restoration and movement of structures, and change of occupancy shall not be mandatory for historic buildings, where such buildings are judged by the building official to not constitute a distinct life safety hazard.	Section 3406.1
03	**Construction Type III-B** Fire resistance rating requirements of elements are as follows: Exterior Bearing walls 2 hours Interior bearing walls 0 Structural frame 0 Floor construction 0 Roof construction 0 The exterior brick bearing walls of the Coaldale School Community Building have an equivalent fire rating of approximately 8 hours. (Please see 1997 Uniform Code for Building Conservation (UCBC), Wall system Item code W-8-M-27, p.110)	Table 601
04	**Construction Type: TYPE III-B** Allowed for A-3 Occupancy buildings no higher than 2 stories and 9,500 sq. ft per floor.	Table 503
05	**Corridor construction.** Corridors shall be fire-resistance rated in accordance with Table 1004.3.2.1, *Corridor Fire-Resistance Rating*. Table requires Assembly Occupancy required egress corridors in unsprinklered buildings serving an occupant load greater than 30 people to be 1-hour fire rated. Corridor walls at Coaldale School, both interior and exterior, have an approximately 8 hour fire-rating, and are most like assembly W-8-M-27,1997 UCBC, p.110. Corridor ceiling at Coaldale School has an approximately 15 minute fire-resistance rating and is most like assembly F.R.-1-16, 1997 UCBC, p 142.	Section 1004.3.2.1
06	**Ceiling height.** The means of egress must have a ceiling height of at least 7 feet.	Section 1003.2.4
07	**Occupant loads. "Maximum floor area allowances per occupant"**	Table 1003.2.2.2
08	Occupant load factor for assembly space is: 7 square feet per person when chairs only are used. 15 square feet per person when chairs and tables are used 1174 sq. ft. ÷ 7 = 167.7 **~ 168 people** 1174 sq. ft. ÷ 15 = 78.26 **~ 79 people**	Ditto
09	Occupant load factor for this type of kitchen should be assumed to be 5 to 7 square feet per person (net). 59 sq. ft. net ÷ 5 = 11.8 **~ 12 people**	Ditto

Item	Description	Code Reference
10	Occupant load factor for stages and platforms is 15 square feet per person. 198 sq. ft. ÷ 15 = 13.2 **~ 14 people**	Ditto
11	Occupant load factor for storage areas is 300 square feet per person. 61 sq. ft. ÷ 300 = 0.20 **~ 1 person**	Ditto
12	Restroom, Entry and Hall are not part of occupant load calculations.	Ditto
13	Occupant load for egress calculations is **195 people.**	Additive total items 8-12
14	**Two means of egress.** Two (2) means of egress required when the occupant load of a room or space is over 50 people and less than 501 people.	Section 1004.2.1 and Section 1005.2.1
15	**Door width.** The minimum width of each door opening shall be sufficient for the occupant load thereof and shall provide a clear width of 32 inches. Clear opening of doorways with swinging doors shall be measured between the face of the door and the stop, with the door open 90 degrees. Where this section requires a minimum clear width of 32 inches and a door opening includes two door leaves without a mullion, one leaf shall provide a clear opening width of 32 inches.	Section 1003.3.1.1
16	**Width of means of egress.** The total width of means of egress in inches shall be not less than the total occupant load served by the means of egress multiplied by the factors in Table 1003.2.3 (0.2 for unsprinklered Assembly Occupancy spaces) and not less than specified elsewhere in this code. **Conclusion: 0.2 inches per occupant x 195 occupants = 39 inches. Therefore, total width of the 2 required exit doorways must be at least 39 inches.**	1003.2.3
17	**50-50 split.** Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity to less than 50% of the required capacity. **Conclusion: Each of the two required exit doorways must have at least one door that measures 32" clear.**	Section 1003.2.3
18	**Exit or exit access doorway arrangement.** Required exits shall be located in a manner that makes their availability obvious. Exits shall be unobstructed at all times.	Section 1004.2.2
19	**Two exit or exit access doorways.** Where two exits or exit access doorways are required, from any portion of the exit access, the exit doors or exit access doorways shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the building or area to be served measured in a straight line between exit doors or exit access doorways.	Section 1004.2.2.1
20	**Corridor width.** 44 inch minimum corridor width is required.	Section 1004.3.2.2

Item	Description	Code Reference
21	**Door swing.** Doors shall swing in the direction of egress travel where serving an occupant load of 50 or more persons.	Section 1003.3.1.2
22	**Exit platform (landing) and stairs.** -Must be constructed of noncombustible materials, exc. handrail may be wood. -Stair width must be the greater of 0.3 x occupant load served (0.3" x195 ÷ 2 = 29") or 44". -Must incorporate a landing in the travel direction of same width as stair. -Must be designed such that water will not accumulate on walking surfaces. -Must be protected to prevent accumulation of snow and ice.	Sections 1003.3.2, 1003.3.3.3.5.2 1002.3.3.3.5
23	**Exit signs.** Illuminated EXIT signs required. Exception 1, Exit signs are not required in rooms or areas which require only one exit. Exception 2. Main exterior exit doors or gates which obviously and clearly are identifiable as exits need not have exit signs where approved by the building official.	Section 1003.2.10
24	**Means of egress illumination.** The means of egress, including the exit discharge, shall be illuminated at all times the building space served by the means of egress is occupied.	Section 1003.2.11
25	**Emergency power supply.** The power supply for means of egress illumination shall normally be provided by the premise's electrical supply. In the event of a power failure, an emergency system shall automatically illuminate all of the following areas: 1. Exit access corridors, passageways, and aisles in rooms and spaces which require two or more means of egress. 2. Exit access corridors and exit stairways located in buildings required to have two or more exits.	Section 1103.2.11.2
26	**Locking devices.** Key locking hardware may be used on the egress side of required exit doors where the occupant load is less than 300 people. If key locking hardware is used, there must be a "readily visible, durable sign on or adjacent to the door stating, "THIS DOOR MUST REMAIN UNLOCKED DURING BUSINESS HOURS." The sign must be in letters not less than 1 inch high on a contrasting background. When unlocked, the single door or both leaves of a pair of doors must be free to swing without operation of any latching device.	Section 1003.3.1.8
27	**One operation.** The unlatching of any leaf shall not require more than one operation.	Section 1003.3.1.8
28	**Posting maximum occupancy.** In all Assembly Occupancy rooms and spaces, the maximum occupancy of the room must be posted near the main exit door from room.	Section 1003.2.2.5

Item	Description	Code Reference
29	**Natural ventilation.** Natural ventilation of an occupied space shall be through windows, doors, louvers or other openings in to the outdoors. The operating mechanism for such openings shall be provided with ready access so that the openings are readily controllable by the building occupants. The minimum opening area to the outdoors shall be 4 percent of the floor area being ventilated	Section 1202.4 and Section 1202.4.1
30	**Attic ventilation.** The net free ventilating area shall be not less than 1/150 of the space ventilated, with 50% of the required ventilating area provided by ventilators located in the upper portion of the space to be ventilated at least 3 feet above eave or cornice vents, with the balance of the required ventilation provided by eave or cornice vents. Vents must be covered by metal or vinyl "screening" with openings not less than 1/8" nor greater than 1/4".	Section 1202.2
31	**Attic access.** An opening not less than 20 inches x 30 inches shall be provided to any attic having a clear height of over 30 inches. A 30-inch headroom in the attic space shall be provided at or above the access opening.	Section 1208.2
32	**Crawl Space Ventilation.** The space between the bottom of the floor joists and the earth, except spaces occupied by a basement or cellar, shall be provided with ventilation openings through foundation walls or exterior walls. Such openings shall be placed so as to provide cross-ventilation of the under-floor space. The minimum net area of ventilation openings shall be not less than 1 square foot for each150 square feet of crawl space area. Six types of covering material are listed in the IBC, the least dimension of the material may not exceed 1/4". Operable louvers are allowed. Crawl space ventilation is not required when a vapor barrier is installed on the ground surface and the interior faces of the foundation walls are insulated in accordance with the *International Energy Conservation Code*.	Section 1202.3 & Section 1202.3.1
33	**Openings below grade.** Where openings below grade provide required natural ventilation, the outside horizontal clear space measured perpendicular to the opening shall be one and one-half times the depth of the opening. The depth of the opening shall be measured from the average adjoining ground level to the bottom of the opening.	Section 1202.4.1.2
34	**Crawl space access.** Crawl spaces shall be provided with a minimum of one access opening not less than 18 inches by 24 inches.	Section 1208.1

Item	Description	Code Reference
35	**Plumbing Fixtures.** Minimum plumbing fixtures for Group A Occupancies...Theaters, halls, museums, etc. Water closets: Female 1 per 65; Male 1 per 125 (see International Plumbing Code for (precise) urinal requirements. The IPC allows substitution of a certain number of urinals for the required water closets in men's rooms, nominally resulting in a 50-50 split); Lavatories: 1 per 200; Drinking Fountains: 1 per 500. (Also see ADAAG guidelines for fixture specifications.)	Table 2902.1
36	**International Energy Conservation Code.** Chapter 13 of the IBC refers the reader to the International Energy Conservation Code (IECC). Intent. "The provisions of this code shall regulate the design of building envelopes for adequate thermal resistance and low air leakage and the design and selection of mechanical, electrical, service water-heating and illumination systems and equipment which will enable effective use of energy in new buildings."	Section 101.3 and others
37	The provisions of this code relating to construction, alteration, repair, enlargement, restoration, relocation or moving shall not be mandatory for existing buildings or structures specifically identified and classified as historically significant by the state or local jurisdiction, listed in the National Register or determined eligible for such listing.	Section 101.2.2.3
38	Even though existing buildings are exempt from the provisions of the International Energy Conservation Code (IECC), it would behoove the owners of any existing building to take measures to improve energy efficiency as much as possible. Chaffee County is in Climate Zone 16 (1 is lowest, 18 or 20 may be highest), which is a high zone for heating requirements. Upper Fremont County would be slightly lower. Lighting: 1.2 watt/ sq. ft. Roof Insulation: R-30 between framing. R-23 continuous. Masonry walls w no cavities: R-9	No reference

BUILDING CODE COMPLIANCE DISCUSSION

In some cases, specific elements of the Coaldale building are discussed and evaluated in the table above in the section outlining the code requirement. Those discussions and evaluations will not be repeated here.

Item 05, Corridor fire rating. The walls meet code but the ceiling is deficient of the 1-hour fire rating requirement. On p. 74, UCBC, 1997, there is a discussion of the code intent with regard to exit width as it affects exiting time. "The Uniform Code's requirements imply an exit capacity of 100 people per 24 inches of exit width [per minute]." Twenty four inches is the figure the Uniform Codes use for the nominal shoulder width of a person (other codes use 22 inches). This means code assumes 100 people can exit past a given point in a minute if the width is at least 24 inches. If this is true, the Coaldale building could be emptied in less than 2 minutes from the time of alarm with only the front double door exit and in less time with a second exit door. Even if it took 5 minutes, the corridor ceiling's fire rating of 15 minutes would allow enough time to empty the building. On the other hand, the corridor fire rating could be considerably improved by the addition of only one layer of 5/8" Type-X gypsum board.

Item 14. Two means of egress. The Coaldale community building does not meet these requirements, One additional egress door is required.

Item 15, Door width. The width of the active leaf of the front door (2'-10 ½") provides an opening approximately 32" when open. Any proposed new exit door can be made to be 32" or greater when open.

Item 16. Width of means of egress. Using the formula of total occupant load served by the means of egress (195 occupants) multiplied by the applicable factor from Table 1003.2.3 (0.2) equals 39 inches. Therefore the total width of the two required exit doors must be at least 39". One leaf of the existing front door provides approximately 32" of exit width. Any new door must provide at least 32". Taken together, the two will provide 64" of exit width, far in excess of the required 39"

Item 17. 50-50 split. Since any proposed new exit door must provide at least 32" of exit width, loss of either door will leave 32" available, far in excess of 14 ½" (39" ÷ 2) required.

Item 18. Arrangement and obstructions. When considered as one large space with the center divider open, all exit doors would be readily visible by occupants regardless of where a second exit is located. If only one new means of egress (exit door) is installed, it could be out of sight of, and unavailable to, the occupants of one classroom if the center divider were closed. The community building operators and users are responsible for keeping all required exits clear and unobstructed at all times.

Item 19, Distance between required exits. This requirement is not easily nor logically met. The distance apart of at least one-half the diagonal distance of the space would require a separation distance of approximately 32 ½ feet (65 feet ÷ 2) when both classrooms are in use simultaneously as a single space. When only one classroom is in use, one half the diagonal distance is 14 feet (28 feet ÷ 2). In general, an additional exit door in either classroom would not be available to the occupants of the other classroom if the folding partition were closed during an event requiring an emergency evacuation. There are few occasions when the two

classrooms are used simultaneously. The north classroom is usually the one used when the room is divided.

A telephone conversation with Fire Chief John Walker confirms Bill Park's understanding that Mr. Walker may support utilizing one of the east windows as a second means of egress if the lower part of the sash at the sill were made operable. If one of the east windows were to be used, he suggests the south window in the north classroom for the following reasons:

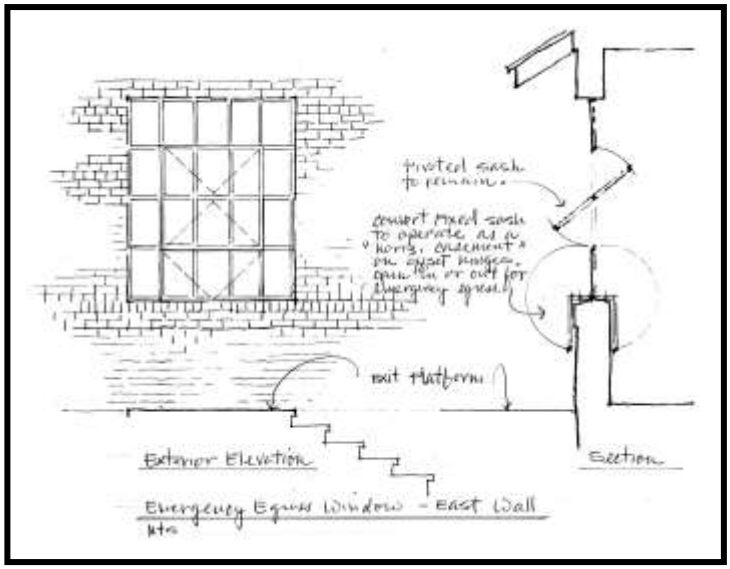
- the north classroom is used more often than the south, when one or the other is used.
- In this classroom, this window is furthest from the entry door.
- the north classroom has the "kitchen" an area in which a fire is more likely
- if the entire space is being utilized, this window is most central for all occupants.

Item 19, separation of exits cannot be met using this window opening; regardless of the options below. From the door into the north classroom, it is 27 feet to this window, when 32 ½ feet is needed. However, this distance is the best that can realistically be achieved within the space of the North Classroom.

Three options for modification of this window to provide a 2nd means of egress are presented below and on the following pages:

Option 1. Emergency Egress Window. This design would modify the 3 fixed lights below the operable sash to make them operable as a single unit.. The sketch shows the 3 lights made into an operable hopper sash on offset hinges allowing it to swing either in or out. This would make an effective opening of approximately 3 feet wide by 3 feet high to use as an exit above the window sill, which is 39" above the finished floor. (Figure 69, below.)

Figure 69. Option 1
Emergency egress window



Option 2. Steel Exit Door to Match Steel Windows. This design would remove the operable pivot sash from the window opening, remove the 3 fixed lights below the operable sash and sawcut a slot in the masonry below the newly modified window opening. A steel door would be fabricated, the top half of which would emulate the steel window pattern utilizing "T" muntins identical to the window muntins and the bottom half would be a solid steel panel. The frame would also be made of identical "T" sections (Figure 70, below.)

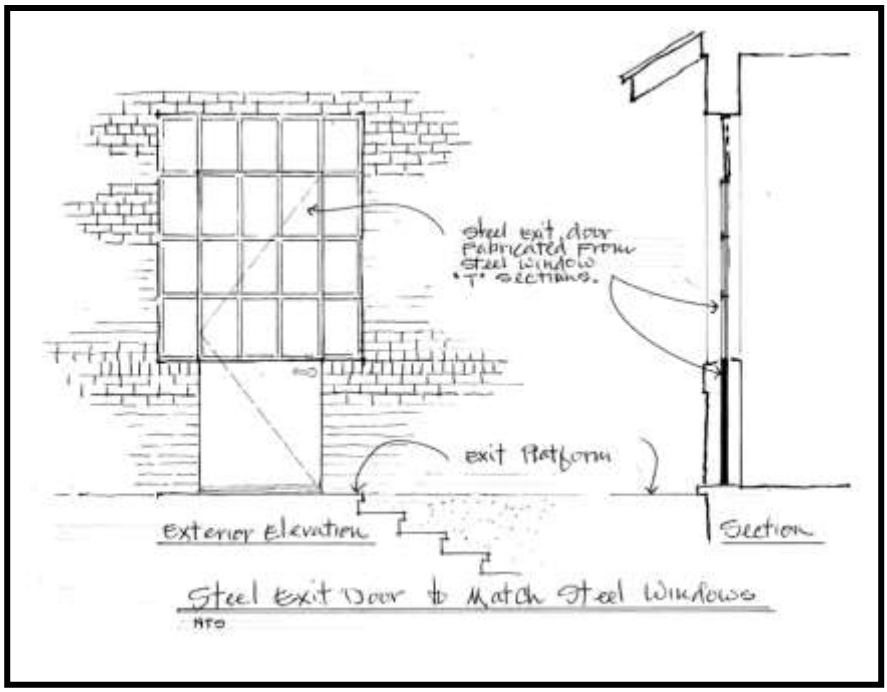


Figure 70. Option 2 - Steel exit door to match steel windows.

Option 3. Steel Exit Door with Fixed Light. This design would make an opening identical to that described in no. 2 above. However, the Option 3 design would use a steel frame and a standard steel door with fixed light. While the door construction would be standard, the size would be custom, because the opening created would be approximately 3'-1 ½" wide x 7'-10 ½" high. (Figure 71, below.)

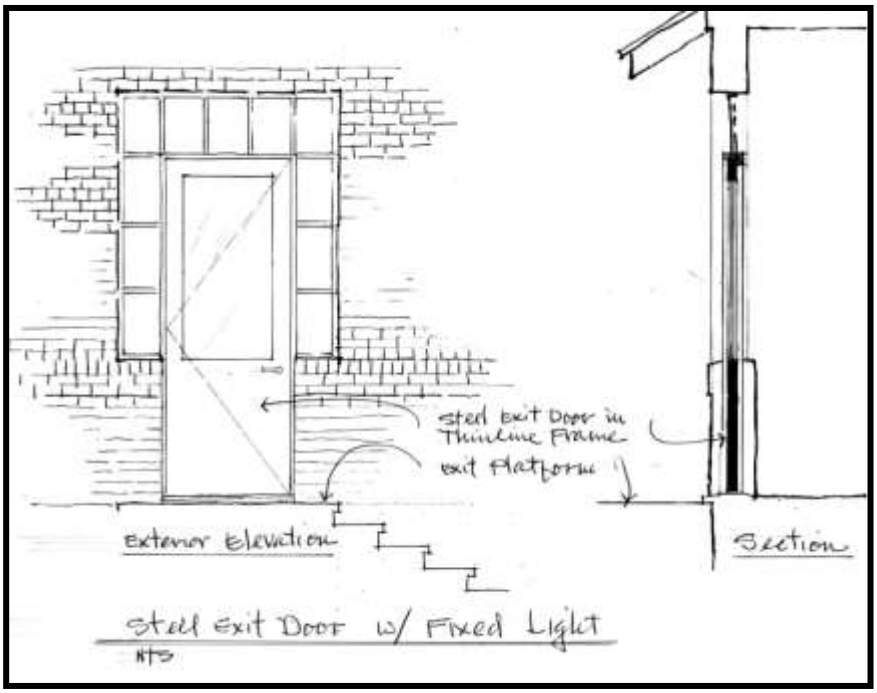


Figure 71. Option 3 - Steel exit door with fixed light in thinline frame..

Of the three window options outlined above, at first glance, Option 1 and Option 2 seem to offer the best means of creating the 2nd means of egress because they appear to be the least detectable as impacts to the character and integrity of the building. However, both modify the original window and are counter-intuitive, i.e., they blend so completely that neither is obvious as an exit. Also, they are basic custom fabrications and would have to be perfectly executed to work properly both as exits and to keep weather out of the building.

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Option 1 above, an egress window, while probably workable, would pose difficulties for the typical older user of the community center. Code allows egress windows only in certain I (Institutional) and R (Residential) occupancies. Use of an egress window in the Coaldale School would require specific building department approval.

Option 3 above offers a straightforward solution for accomplishing a 2nd means of egress that is likely to be more workable and constructible than the other two. It is straight forward in that it is not trying to be anything other than a door in an opening, thus making it an honest expression of an element fulfilling a need. It would be tighter fitting, relatively easy to fabricate, would be an obvious exit door, and would be easy for all users to navigate. While this solution would affect the absolute visual symmetry of the east facade, perhaps more than the other two, it would not be so different as to be noticeably out of place, having little negative effect as compared with the other two.

Any 2nd exit solution from the east side of the building will require a platform with stairs leading to the ground. This construction will have to meet code also, including a weather covering (roof) (See Item 22 below).

Due to the impact on the integrity of the building's east facade by inserting an exit into a window opening, a 4th option has been suggested for consideration by the SHF reviewer. Option 4 is that of creating a new exit door in the east end of the north wall, the wall behind the current location of the refrigerator. To effect this solution, the refrigerator would have to be moved to a new location, and most probably the cabinet space on the north wall would have to be reduced. A new exit door in this location could satisfy Items 14 –18. However, Item 19, minimum separation distance cannot be satisfied with this solution either; separation between exits would be 24 feet vs. the 32'.-6" requirement. An additional drawback to this solution is that it is basically in the kitchen area, where the likelihood of fire is higher than in the classrooms, albeit at the opposite end of the kitchen from the stove and water heater. A door at this location would result in a travel distance for anyone in the far southeast corner of the stage of approximately 58 feet as opposed to 34 feet to the southernmost window in the North Classroom. The impossibility of meeting Item 19 with any of the four options raises the question of whether perhaps two new means of exit are necessary.

There is a major crack in the north end of the east wall which will be monitored with crack monitors. If a new exit door is placed here, it should be done only after it has been determined whether movement is occurring at this corner. Any new door in this location should be held at least 12" west from the inside corner (20" from the outside corner) to preserve the structural integrity of the masonry.

Any new 2nd exit door will be an impact on the visual and physical integrity of the building. The east facade with its row of character defining windows would be disrupted visually if a new door were introduced into any one of them. This is also true in the case of either or both of the

currently blank north and south brick walls. A new door in the north wall only would be least noticeable from the exterior by most passers-by and building users.

Insertion of a door into one of the existing window openings would be least structurally intrusive because only a part of the window and a part of the wall below the window would be cut out. The window lintel would be unaffected, and continue to carry the masonry wall and roof above it. Insertion of a new door in either of the currently blank brick end walls would require cutting out the brick, installing a new lintel, and patching and matching brickwork.

As stated earlier, there is no location in any of the building walls where a single new exit door will meet the letter of the code when the building is considered as a whole. The window location comes closest to conformance.

Item 22. Weather covering over exit platform and stair. The recommendations below call for constructing a new exit door in the north wall of the building rather than one of the exits through an existing window. The north wall actually faces northwest and even in the winter gets some afternoon sun. This roof element may or may not be required if the community can demonstrate to the building official that snow and ice do not accumulate in this location. If not required by the building official, install a gutter at the existing main roof eave over the exit platform and stair to prevent dripping.

Item 38. Building Insulation. The attic is insulated with approximately 3 to 4 inches of blown-in cellulose insulation which should provide R-3.70 per inch thickness or a total of about R-11.1 to R-14.8. There is no insulation in the walls, but the brick alone is worth R-4.0 per 4 inch thickness or about R-9 total. There is no other insulation. Many studies have shown that, in general, the greatest heat loss in most buildings is through the ceiling and roof rather than the walls.

Item 38. Window Insulation. Being single glazed, the window glass has a low R-rating, the steel muntins conduct heat to the outside and the interface between the steel of the operating and fixed sashes leaks tempered air to the outside.

These deficiencies are somewhat alleviated by the quilted blanket roman shades. However, the shades are slightly too narrow and too short for the openings, leaving spaces around their perimeters. They are out of adjustment, do not fit snugly, and it is questionable whether they could be adjusted without major overhaul. They are mounted about 1" inside the window opening rather than closer to the sash where they could be fastened to the sash with magnetic strips, Velcro or similar devices. They exist in the classrooms only, leaving the Hall and Restrooms without any insulating treatment.

Installation of storm windows would be a more permanent solution than the insulated quilted blankets. Interior rather than exterior storm windows would preserve the window appearance from the exterior and provide for ease of operation. The storms would need to have an operable panel to allow the pivoted window sash to operate. They would have to be custom fabricated to size and made removable for washing. Acrylic panels would be acceptable as an alternative to glass.

Regardless, the monetary payback of any warm window or storm window system is questionable since the building is maintained on minimum heat except during actual use. However, any improvement would be a contribution to sustainability, lower operating costs and

increased user comfort. (See National Park Service *Preservation Brief No. 13.*, Appendix E, for additional discussion.)

BUILDING CODE COMPLIANCE RECOMMENDATIONS

Some elements of the recommendations below may overlap with items in the body of the report where they are more applicable. That is, they are items affected by both code requirements and building preservation. For instance, Installation of a new crawl space access door and crawl space ventilation is covered under the "Foundations" section. Please see these sections for complete recommendation verbiage.

- **Item 05.** Install one layer 5/8" Type "X" gypsum board at Hall ceiling.

- **Item 14-19. Item 22. Second means of egress.** Install a new exit door in the north wall of the building per Option 4 with appropriate foundations, framing, platform, roof covering over platform, stairs, guard and handrail. These should be constructed of masonry, steel, or concrete. If this means is approved by the building official, do not proceed until completion of crack monitoring at the northeast corner of the building.

  Consult with the Fremont County Building Official during construction documents phase of the project,. Approach building official with a proposal to install a new exit door in the north wall to minimize impact on the historic resource. Review the four potential means of egress locations to provide him a range of nominally acceptable means (from the historic preservations point of view). It is his/her responsibility to balance life safety against impact on the integrity of this resource.

- **Item 22.** Install new roof over exit platform and stair. The requisite roof covering the exit platform and stair, if required should be a simple shed of the same roof pitch as the main roof. It may be appropriate to return the roof to the walls in a hip configuration at each end. It should extend approximately 4'-0" from the wall so it covers the entire platform and stair. It should be standing seam metal of the same material as the main roof. Cap flashing at the brick wall should be hooked at the top and let into a reglet in a brick joint at least 8" above the point where the roofing contacts the wall. Alternative design configurations should be studied.

- **Item 23, 24, & 25.** Install hardwired illuminated EXIT sign and emergency lighting with integral battery backup.

- **Item 26 & 27**. Install new hardware on entry doors. Install sign saying "THIS DOOR MUST REMAIN UNLOCKED DURING BUSINESS HOURS."

- **Item 28.** Install sign saying occupancy load for the classrooms is 194 people.

- **Item 30. Attic ventilation.** While required by code, attic ventilation would be very difficult to achieve in this building until a new roof is installed in the future, and since there is no apparent negative effect in the attic framing from lack of ventilation, there is no immediate urgency. However, when a new roof is installed, attic ventilation should be incorporated into it. The upper vents can be accomplished by installing low profile roof vents on the east roof plane a foot or so below the ridge to decrease visibility from the front. They should be evenly

spaced so as to provide a pattern, and in sufficient number to meet code. Maximum size of individual vents should be no greater than 18" x 18". Eave vents can be achieved by installing screens in frames in place of selected existing wood trim closers under the eaves between rafters.

- **Item 31. Attic access.** Increase attic access opening size to 20” x 30” in existing location. Modify ceiling framing to retain structural integrity.

- **Item 32**. **Crawl space ventilation.** Install additional crawl space ventilation. See Foundation section for discussion and recommendations.

- **Item 34. Crawl space access.** Install new crawl space access door in east foundation wall. See Foundation section for discussion and recommendations.

- **Item 38. Building insulation.** Add 6 inches of fire resistant treated loose fill insulation or unfaced fiberglass batts on top of the ceiling framing in the attic in areas that have no walk surface, for a total of 9 to 10 inches. This will provide a total of R-33.3 to R-37.

- **Item 38. Window insulation.** Install interior storm windows, interior as storm windows is a reasonably permanent solution, increasing the R-rating and the comfort level for users, as well as to the preserve the window appearance from the exterior. Incorporate an operable panel in the design to allow the existing window sash to operate. Since standard windows for this application are not available, they will have to be custom fabricated to size. Acrylic panels are acceptable as an alternative to glass. Install thin bulb or felt type weather-stripping, at all operable sash.

ACCESSIBILITY COMPLIANCE

The table below is not exhaustively inclusive and the verbiage is not, in every citation, verbatim from the code.

Item	Description	Code Reference
01	**General.** The accessibility provisions excerpted below from Chapter 11 are the basic requirements for all new construction. The provisions excerpted from Chapter 34 are applicable to existing buildings (including historic) and may modify some of the provisions of Chapter 11.	NA
02	**Where required.** Buildings and structures, temporary or permanent, including their associated sites and facilities, shall be accessible to persons with physical disabilities.	Section 1103.1
03	**Existing buildings accessibility**. Existing buildings shall comply with Section 3408.	Section 1103.2.2
04	**Site arrival points.** Accessible routes within the site shall be provided from public transportation stops, accessible parking and accessible passenger loading zones, and public streets or sidewalks to the accessible building entrance served.	Section 1104.1
05	**Connected spaces.** When a building, or portion of a building, is required to be accessible, an accessible route shall be provided to each portion of the building, to accessible building entrances, connecting accessible pedestrian walkways and the public way	Section 1104.3
06	**Toilet and bathing facilities.** Toilet rooms and bathing facilities shall be accessible.	Section 1108.2
07	**Technically infeasible.** Where it is technically infeasible to alter toilet and bathing facilities to be accessible, an accessible unisex toilet or bathing facility is permitted. The unisex facility shall be located on the same floor and in the same area as the existing facilities.	Section 3408.7.9
08	**Definition of Technically infeasible.** Means, with respect to an alteration of a building or facility, that it has little likelihood of being accomplished because existing structural conditions would require removing or altering a load-bearing member which is an essential part of the structural frame: or because other existing physical or site constraints prohibit modification or addition of elements, spaces, or features which are in full and strict compliance with the minimum requirements for new constructions and which are necessary to provide accessibility.	Section 1102, Definitions

ACCESSIBILITY DISCUSSION

The table above does not outline all accessibility requirements. Items such as 1/2" maximum thresholds, lever handles on doors, maximum settings for door closers, and all the requirements

for accessible toilets can be found in the verbiage of the Americans with Disabilities Act Accessibility Guidelines (ADAAG). This resource is a valuable addition to any public building operator's reference shelf. The information also can be found on (and downloaded from) the U.S. Department of Justice web site at <www.usdoj.gov/crt/ada>.

The goal of the community should be to make the community building as accessible as possible within the constraints of good preservation practice The building itself and the concrete walk from the parking lot is generally accessible. A single leaf of the pair of entry doors and the doors from the Hall into the Classrooms are wide enough and the thresholds are sufficiently low. Restrooms, doorknobs and some other minor items are not in compliance, but the interior doorknobs are character defining and should be retained as is.

The restroom dimensions of 5'-6" by 6'-10" are identical to the recommended minimum dimensions of the one of the ADAAG examples (See Figure 73), indicating that it quite possibly could be made accessible. However, achieving full compliance would require installation of new fixtures in slightly different locations and shifting the doorway to one side or the other of the hall. The restroom doors themselves are too narrow, but the masonry opening is 2'-8" and a reasonably judicious rework of the frame on the hall face of the opening and re-swing of the door to open out could be done to effect an accessible opening in its current nominally centered location relative to the Hall.

ACCESSIBILITY RECOMMENDATIONS

- Keep parking area designated as the accessible space well graded and drained and free of stones that could impede wheel chairs or increase difficulty for otherwise mobility impaired persons.
- Install lever handles on entry doors.
- Re-convert the storeroom (former restroom) into a restroom. Make doors of both restrooms as accessible as reasonably possible short of widening or moving doorway openings to the east or west relative to the Hall. (See Figures 72 & 73 below.) Re-swing the doors to swing out on new thinline frames in such a way as to preserve the existing 32" opening. Install grab bars. Install lever handles on faucets. Install tilted mirror or an additional lower mirror.

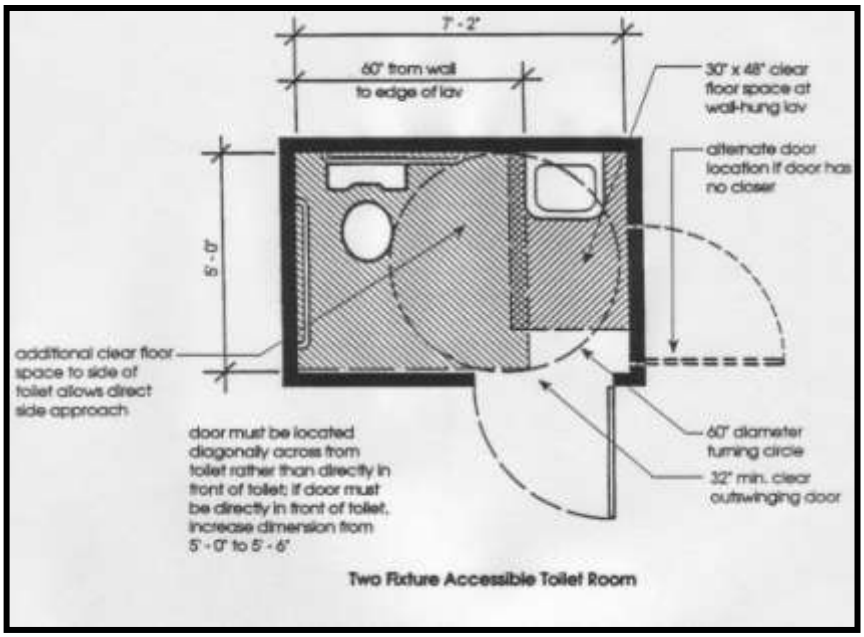

Figure 72. Example 1, accessible toilet room.

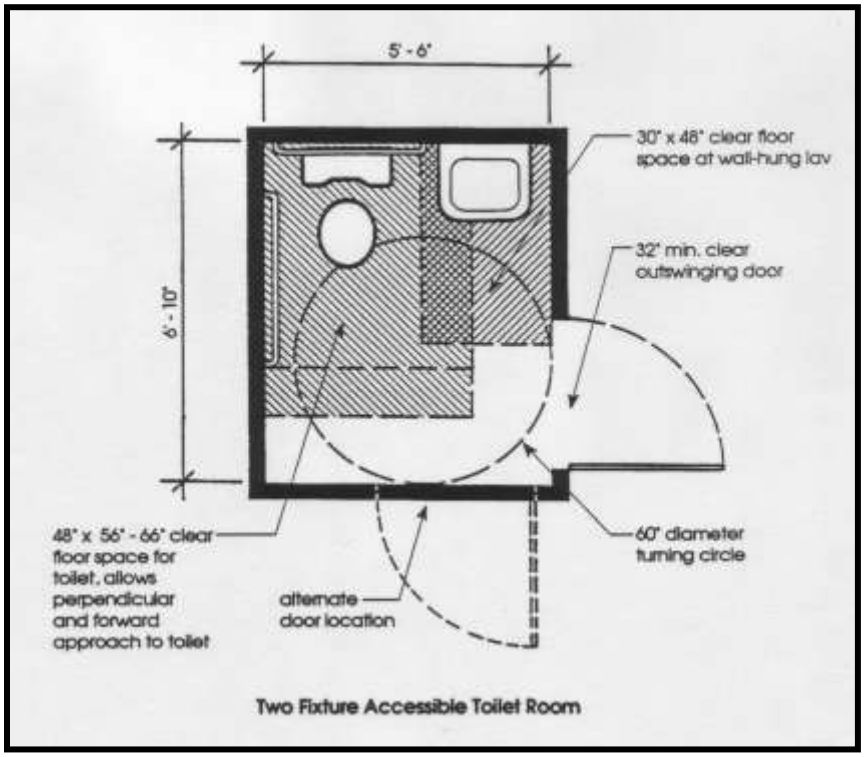

Figure 73. Example 2, accessible toilet room.

PRESERVATION PLAN

TREATMENT RECOMMENDATIONS

The following treatment approaches, included here for information only, are defined in the Secretary of Interior's Standards for Treatment of Historic Properties (Secretary's Standards). The verbiage below, inside the quotation marks, is taken verbatim from page 7 of the CHS SHF's ***Historic Structure Assessment Annotated Scope of Work*** and ***Choosing the Appropriate Treatment.***

"Preservation places a high premium on the retention of all historic fabric through conservation, maintenance, and repair. It reflects a building's continuum over time, through successive occupancies, and the respectful changes and alterations that are made.

"Rehabilitation emphasizes the retention and repair of historic materials, but more latitude is provided for replacement because it assumes the property has suffered more deterioration prior to work than has a property that might be considered for Preservation. (Both Preservation and Rehabilitation standards focus attention on the preservation of those materials, features, finishes, spaces, and spatial relationships that, together, give a property its historic character.)

"Restoration focuses on the retention of materials from the most significant time in a property's history, while permitting the removal of materials from other periods.

"Reconstruction establishes limited opportunities to recreate a non-surviving site, landscape, building, structure, or object in all new materials.**"**

Note that the term **Preservation** (upper case) used in the context of a treatment approach has very specific meaning under the Secretary's Standards. The terms or words, **preserve, preserving, preservation** (lower case), used throughout the text of this HSA are generic and simply mean the preserving of something, anything from bricks to architectural character to fruit jellies, jams, and preserves.

RECOMMENDED TREATMENT APPROACHES FOR COALDALE SCHOOL

It is recommended that the Coaldale School be **R*ehabilitated***, with respectful changes to character-defining elements that are necessary to provide facilities needed for accessibility, code compliance, and continued community use. Please see Appendix C--Secretary's Standards for the complete verbiage of the Secretary of the Interior's Standards for Rehabilitation.

The exterior character of the entire school should be preserved as much as possible, allowing for the replacement of deteriorated elements and for the installation of a new accessible exit door or doors.

The character of the interior of the hallway and classrooms, with their accoutrements, should be retained as much as possible while providing facilities and functional needs for community use.

Existing playground equipment should be retained and repaired. The lilac hedge along the east wall of the school should be moved six feet away from the wall, to allow for drainage away from the building.

PRESERVATION PLAN

PRIORITIZED WORK

As stated above, the overall treatment recommendation for the Coaldale School/Community Building is Rehabilitation.

Those preservation items identified as having Critical and Serious deficiencies should be accomplished as soon as reasonably possible. Exterior items having to do with keeping water and moisture out of the building should be given highest priority. However, titems of like nature that, from the constructability and building trades point of view, work efficiently together will be packaged and phased together.

A number of building code and accessibility items have been identified. Those having to do with life safety will be given higher priority than those that don't have a material effect on life safety. To the greatest extent possible, these will be accomplished with other like work.

Items having to do with habitability or usability of the building must be given a reasonably high priority simply due to the fact that the more regularly and consistently the building is used, the better it will be preserved. For instance, if the heating system remains deficient, the building will not be used in the winter and shoulder seasons as much as it would if it had an adequate heating system.

PHASING PLAN

PHASE ONE

- Exterior building preservation items
- Monitor masonry movement
- Correct exiting and electrical service safety deficiencies

FUTURE PHASES

- Exterior building preservation items, esp. foundations and masonry
- Correct crawlspace ventilation deficiencies
- Correct additional code and accessibility deficiencies.
- Plumbing revisions
- Grading and site preservation
- Interior building preservation items
- Install new heating system
- Correct remaining electrical deficiencies
- Install additional insulation.

COST ESTIMATE

COST ESTIMATES

Estimates have been removed from the document because costs change rapidly.

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APPENDIX A - THE GRANGE

A Short
History of the Order of Patrons of Husbandry
The National Grange[27]

By Charles P. Gilliam

Founding of the National Grange

In 1866 Oliver Hudson Kelley, a native of Massachusetts, received a commission from President Andrew Johnson to survey agricultural conditions in the Southern states because there was a dearth of reliable information following the War of 1861-1865.

What Kelley saw of conditions in the South and the advantage being taken by Northern carpetbaggers of beleaguered farmers, his work as a Minnesota farmer, his study and writings on agriculture and his association with the Masonic Order combined in the conception of a notion to extend a fraternal hand of friendship to farmers and rural people of the North, South and West to, as he wrote, "restore kindly feelings among the people."

"We cherish the belief that sectionalism is, and of right should be, dead and buried with the past. Our work is for the present and the future. In our agricultural brotherhood and its purposes, we shall recognize no North, no South, no East, no West."
-- 1874 Declaration of Purposes of the National Grange

The late War Between the States had of course devastated the Southern farmer, but it had affected others as well. Many Northern rural people were cripples or lost members of their farm families as a result of the war. While carpetbagging was a regional issue there were also middlemen and rail road barons who, as many farmers saw it, were feasting on the life's blood of the working man of all regions.

Kelley returned briefly to his Minnesota farm but never returned to farming in a substantive way. In the Autumn of 1866 he departed for Washington to accept a position in the Post Office Department and it was from there that he set about to organize the Order of Patrons of Husbandry, the National Grange.

Kelley joined with six others, William Saunders (first National Master), Aaron B. Gosh, John Trimble, John R. Thompson, Francis McDowell and William M. Ireland who became the Seven Founders of the National Grange. Kelley was the first Secretary. Although there was an agricultural background among the Seven Founders, five were currently Washington government officials, one was a banker, one was a minister and none were active farmers.

[27] This article is downloaded from http://www.geocities.com/cannongrange/cannon_nationalhistory.html?20068.

While much of the early history of the Grange was aimed at assisting farmers in the South and West (their West is now our Mid-West) all of the Seven Founders hailed from north and east of those regions (Massachusetts, New Jersey, New York, New Hampshire, Pennsylvania and Scotland).

The National Grange was officially founded on December 4, 1867 in the office of William Saunders, Superintendent of Propagating Gardens in the Department of Agriculture. In the very early years Kelley was practically a one-man crusade. There was a slow start and it was by no means ensured the movement would ever get off the ground. But, it did and by 1874 (the first year for which there are records) there were 268,368 dues paying members.

Original Principles

It was a key principle of the concept for a National Grange that it was a fraternal organization for men and women. Although not all of the Seven Founders were Masons, the example of the Masonic Order was the model for much of the ritualistic and fraternalistic under pinning. Other precepts included that the Order was open equally to women and men, it was Christian but not sectarian and it was non-sectional, indeed anti-sectional.

"We proclaim it among our purposes to inculcate a proper appreciation of the abilities and sphere of woman, as in indicated by admitting her to membership and position in our Order."
-- 1874 Declaration of Purposes of the National Grange

In 1874 at the St. Louis session of the National Grange a "Declaration of Purposes" was adopted. This was done to proclaim the purposes of the fraternity of farmers in a constructive way. At that time there was great interest in the National Grange and a boom in its membership, but there also was concern among the national leadership that excesses were detracting from the true broad based purposes of the Grange and focusing attention on specific, albeit electrifying, issues. That year's report of the executive committee said:

> *Unfortunately for our Order, the impression prevails to some extent that its chief mission is to fight railroads and denounce capitalists. It is a work of time to remove these erroneous impressions, and to prove that we do not wage a meaningless aggressive warfare upon any interest whatever. . . . While we aim to elevate ourselves, we avoid doing so at the expense of running down others.*

The "General Objects" of the Order so adopted were two:

1. *United by the strong and faithful tie of Agriculture, we mutually resolve to labor for the good of our Order, our country, and mankind.*

2. *We heartily endorse the motto: "In essentials, unity; in non-essentials, liberty; in all things, charity."*

"We propose meeting together, talking together, working together, buying together, selling together, and, in general, acting together for our mutual protection and advancement, as occasion may require."

--1874 Declaration of Purposes of the National Grange.

1870s: Boom and Collapse

By the mid 1870s interest in the National Grange was intense and membership exploded. This was influenced by the financial panic of 1873 and also partly by a general awakening of the farmer to fight

against the middleman, the railroads and others with inimical interests. In 1875 Grange membership was 858,050. State Grange organizations were being established in all regions of the country; membership was especially strong in the South. (The Connecticut State Grange was organized in 1875.)

Buying cooperatives were established, middlemen were eliminated and prices reduced. Other cooperative enterprises, such grain elevators and mills, were introduced. The Grange took on a more economic role than was originally envisioned. In some ways the Grange replaced the middleman more than eliminated him. In principle economic involvement was a purpose of the Grange, but its rise in importance was rapid and for many in the movement the role of the Grange in commerce started to become pervasive to the detriment of other goals.

"We must dispense with a surplus of middlemen, not that we are unfriendly to them, but we do not need them. Their surplus and their exactions diminish our profits."

-- 1874 Declaration of Purposes of the National Grange

This manner and speed of growth was a matter of controversy and could not be sustained. Many who joined were interested only in enjoying supplier-direct discount pricing or in enjoying some other transient advantage. It appears that some joiners were even secret supporters of middlemen, railroads and others aiming at stopping the Grange movement. D. Wyatt Aiken, a congressman and Master of the South Carolina Grange wrote:

> *Everybody wanted to join the Grange then: Lawyers, to get clients; doctors, to get patients; merchants, to get customers; Shylocks, to get their pound of flesh; and sharpers, to catch the babes from the woods.*

Membership in the Grange soon collapsed. By 1879 membership was down to 246,383, the same as before the boom, but it fell by half from even that level and through the 1880s languished at barely over one hundred thousand.

By the end of the century the Grange was extinct in the Southern states. It was reborn, albeit in a modest way, in the outer South in the 1930s and 1940s, but to this day there is no Grange in the deep South. In New England and the West the Grange endured to revitalize, this time on sturdier foundations, through the first third of the Twentieth Century. Dues paying membership held steady at around six hundred thousand in the 1920s and 1930s and right after the Second World War was back to the levels of the mid-1870s.

After the 1870s the protest political movement exemplared by the *Granger Laws* was carried on by the Greenback Party, Farmers Alliance and Populist Party. Yet, after the 1870s the National Grange stayed ahead of its time on a number of controversial issues such as federal income taxation, direct election of United States Senators and women's suffrage.

Near the turn of the century the National Grange was starting to re-emerge from a trial in the wilderness. The gradual re-emergence of the National Grange was based on the original precepts of a fraternal, social organization. This change probably suited most of the original Grangers well.

The National Grange and Public Policy in History

The National Grange has always been strictly non-partisan. Yet, political matters were part of the heart of its early existence and remain an important factor today. The National, every State and every Subordinate Grange has a legislative committee, adopts resolutions on matters of public interest and encourages involvement of members in matters of public concern. In history some of the policies of the Grange were ground breaking, before their time, even radical. Following are five exemplars. *Famous, mundane, radical, conservative, futuristic.*

"It is [every member's] duty to do all he can do to put down bribery, corruption and trickery; to see that none but competent, faithful and honest men, who will unflinchingly stand by our interests, are nominated for all positions of trust; and to have carried out the principle which should always characterize every Patron that 'The Office Should Seek the Man, and Not the Man the Office.'"
-- 1874 Declaration of Purposes of the National Grange

The Grange versus the Railroads

The Grange movement is perhaps best remembered in history for battles with the rail road magnates, or robber barons, depending on one's point of view. The United States government gave the railroad companies vast amounts of farm land and, of course, railroads had monopolies on carriage of grain and other farm produce and supplies. The railroads were viewed as high handed, greedy and unscrupulous.

"We are not enemies of railroads, navigable and irrigating canals, nor of any corporation that will advance our industrial interests, nor of any laboring classes."
-- 1874 Declaration of Purposes of the National Grange

War with the railroads was not an original purpose of the National Grange, but taking on the railroads turned out to be a natural extension of the theme of equal opportunity and condemning exorbitant profits taken by middlemen. Many state legislatures enacted what were known as the *Granger Laws* lowering freight rates and establishing state railroad commissions to regulate railroads and eventually other public utilities.

The railroads fought back and succeeded in repealing some legislation. The judicial challenge to regulation ultimately did not succeed. In *Munn v. Illinois* (1876) the Supreme Court approved public regulation of public utilities. The "final" outcome of the battle was the creation in 1887 of the Interstate Commerce Commission.

Today, Grange policy concerning rail roads is comparatively subdued. Legislative policy includes addition of more commuter trains, warning reflectors on the sides of railroad cars, better integration of railroad and highway policy and support for "the development and maintenance of a strong and effective rail network that will efficiently transport agricultural products and passengers at reasonable freight rates."

"We are not enemies to capital, but we oppose the tyranny of monopolies."

-- 1874 Declaration of Purposes of the National Grange

Rural Free Delivery

The National Grange in the 1870s initiated the campaign for rural free delivery (RFD) of the mail. At the time rural people had to drive into town to the post office to collect mail while city dwellers had mail delivered to their door.

In 1896 experimental routes were established and by the turn of the century RFD was wide spread. There was opposition to RFD and the legislation allowing it passed by only two votes in the United States Senate. Opponents of RFD said it was a waste of money and would destroy rural life. RFD turned out to be a great boom [sic] for farmers. An 1897 study by the Post Office Department estimated that the availability of RFD increased the value of farm land $2.00 - $3.00 and acre and resulted in improvement of many rural roads since post office patrons were required to bring roads up to standards to receive RFD.

In 1887 the National Grange proposed establishment of the parcel post system. At the time there were five express companies handling parcel delivery at what were contended to be high prices with poor service. These companies opposed the Post Office entering the parcel business. In 1912 a parcel post law was enacted.

Today the National Grange opposes first class mail subsidization of junk mail rates and opposes elimination of Saturday mail delivery.

Progressive Taxation

The National Grange was an early advocate of a progressive federal income tax. In 1880 the National Grange convention resolved:

> *We demand the immediate enactment of a graduated income tax, to the end that all wealth may bear its just and equal proportion of the expenses of government, and that productive industry be so far relieved from the burdens of taxation as shall be consistent with strict justice to all.*

In the 1930s the National Grange proposed a graduated land tax "to discourage excessive land holdings and to promote home ownership of the family-sized farm."

"We desire a proper equality, equity, and fairness; protection for the weak; restraint upon the strong; in short, justly distributed burdens and justly distributed power. These are America ideas, the very essence of American independence, and to advocate the contrary is unworthy of the sons and daughters of an American Republic."
-- 1874 Declaration of Purposes of the National Grange

The federal income tax became law in 1913 but proved to be somewhat too much of a good thing. Today, National Grange policy favors reductions in income taxes including return to the rates in the compromise Tax Reform Act of 1986, elimination of the capital gains tax, elimination of the tax on social security and elimination of the marriage penalty.

Community Farming

The National Grange supported family farming and not corporate or large-scale farming. The Grange warned against over production, believing that production should be expanded only when new markets were at hand. It opposed government subsidization of large scale irrigation projects in dessert lands where they could not be economically justified. Of course many of these types of things which the Grange opposed did come to fruition and it is a matter of debate as to whether and to what extent they were fruitful.

"We long to see the antagonism between labor and capital removed by common consent, and by an enlightened statesmanship worthy of the nineteenth century. We are opposed to excessive salaries, high rates of interest and exorbitant profits in trade. They greatly increase our burdens and do not bear a proper proportion to the profits of producers."
-- 1874 Declaration of Purposes of the National Grange

The National Grange supported cooperative farm credit but not banking centralization which was seen as inapposite to the idea of local based institutions. Some government programs were lobbied for and won including the 1916 Federal Farm Loan Act and 1937 Bankhead-Jones Act which provided credit, including for farm purchases, supporting Grange policy of turning tenant farmers into farm owners.

Temperance and Tobacco

Today, anti-smoking is politically de rigueur but this is a recent phenomena. The National Grange historically was not a friend of tobacco products. For a hundred years curtailment of the cigarette business, education on the evil of smoking, increased cigarette taxation and restrictions on manufacture and sale (especially to minors) was urged. For example, at the 1929 National Grange convention a resolution was adopted urging local school boards to discourage smoking by teachers so they could set an example for children.

Current National Grange legislative policy can make a distinction between the tobacco farmer and tobacco use. The Grange supports efforts to diversify tobacco farmers into other products and to use some of the money from the pending "class action settlements" to ease dislocation in tobacco farming.

From the beginning the Grange espoused temperance. In 1905 the National Grange adopted a rule excluding from membership anyone engaged in the sale of intoxicating liquors. The National Grange supported the prohibition movement and when prohibition became the law of the land the Grange deplored resulting uneven and lax enforcement.

After repeal of prohibition the National Grange promoted temperance in the local communities including education of adults and children and opposition to use of intoxicants by youths.

Structure of the National Grange Community (Adapted from an official summary supplied by the National Grange)

The National Grange is comprised of four distinct divisions built one upon the other in logical sequence:

1. The Subordinate Grange,
2. The Pomona Grange,
3. The State Grange and

4. The National Grange.

The Subordinate (local) Grange
The local unit of the organization is built around the community. Men, women and youth are admitted on equal terms. Those who are 14 years of age are eligible for full membership. Each member has one vote. The local Grange elects its own officers and controls its own affairs in community matters. It confers the first four ritualistic Degrees: symbolic of the four seasons and life on the farm.

Although regular business meetings of the Subordinate Grange are for members only, the educational and literary programs are frequently open to the public. All Grange activities are for the purpose of developing leadership, improving community life, and expanding opportunities for all people.

Today, approximately three hundred thousand people are members of Subordinate Granges in 3,600 communities nationwide.

The Pomona (county or other region) Grange
Subordinate Granges within a given district are grouped together on a county or other regional basis into Pomona Granges that meet monthly or quarterly. The Pomona Grange offers the Fifth Degree of the Order, thus extending the lessons and opportunities of the Subordinate Grange. The Pomona Grange provides the leadership for educational, legislative, and business interests of the Subordinate Granges in its jurisdiction.

Members of Subordinate Granges are not required to receive the Fifth Degree but are encouraged to do so.

The State Grange
The State Grange is a delegate body representing Subordinate and Pomona Granges. At their annual conventions, State Granges consider many important matters relating to legislation and public policy, with particular reference to agriculture, other matters of concern to rural America and the general welfare of the state as a whole. Inasmuch as State Grange policies originate in the Subordinate and Pomona units of the Order and are conveyed through their delegates, this branch is, in a special sense, expressive of Grange thought and sentiment throughout the entire state.

Voting authority is vested in the delegate body, which in most instances, is composed of the Masters of Subordinate and Pomona Granges and their spouses, if also members, each having one vote.

The Sixth Degree of the Order is conferred at the state conventions and is open to all members of the Pomona Grange.

There is a State Grange in 37 states. The missing states are in the deep South and the less-arable regions of the far West.

The National Grange

This is the parent branch of the Order which speaks with authority and understanding for the major branches of agriculture and rural America. All business sessions of the National Grange

are open to any Subordinate Grange member in good standing. As spectators, they have no vote in the deliberations, but they do have ample opportunity to appear before committees and to testify. As the supreme legislative body of the Order, policies are developed through the channels of Subordinate, Pomona and State units, and consequently embody the seasoned judgement of the membership.

At the annual convention of the National Grange, one day is devoted to the conferral of the Seventh Degree, the highest degree of Order. This degree is open to all members of a State Grange. Degree candidates and members gather from all parts of the nation for this annual ritualistic event.

The National Grange Headquarters is 1616 H Street, N.W., Washington, D.C. 20006 (202) 628-3507. One may visit its attractive re-designed web page at**www.nationalgrange.org** for more information.

Patrons of Husbandry - Background, History, Ritual and Emblems[28]

The Grange was founded in 1867 as a fraternal trade society for small farmers and their families in the United States. The National Grange of the Order of the Patrons of Husbandry was founded by a Freemason named Oliver Hudson Kelley in Fredonia, New York. It was a secret society arranged along the lines of Freemasonry, and dedicated to promoting rural life. However, its initial membership included great numbers of urbanites.

[28] Downloaded from http://mill-valley.freemasonry.biz/marin-fraternities-02.htm#Patrons%20of%20Husbandry

The Grange ritual and ceremonies consisted of seven degrees, which are in order of first to last: Laborer (Maid), Cultivator (Shepherdess), Harvester (Gleaner), Husband (Matron), Pomona, Flora, and Ceres. The bracketed names are the degree names for women taking the degree. Full membership was attained after receipt of the fourth degree, Husband/Matron. The first four degrees were conferred in Subordinate Granges. The three higher degrees, named for Roman or Italian deities were conferred respectively in Pomona Granges, which are district or county associations of Granges; the State Grange; and the National Grange. An order within the seventh degree (Ceres), the Order of Demeter or the Priests of Demeter controls the ritual of the organization.

The First Degree (Laborer/Maid), presents the emblems of the ax, plow, harrow, and spade. A symbol is the spring. The Second Degree (Cultivator/Shepherdess) presents the emblems of the hoe and pruning knife. A symbol of it is summer. The Third Degree (Harvest) presents the sickle as its emblem. The Fourth Degree (Home) presents the agate as its emblem.

APPENDIX B - MAINTENANCE CHECKLIST

W - Weekly, M - Monthly, Q - Quarterly, SA - Semi-Annually, A - Annual, ST - after a Storm SAT - Satisfactory, UNSAT – Unsatisfactory

ITEM			TASK	W	M	Q	SA	A	ST	SAT	UNSAT
3.1	**SITE**										
	3 (See foot-note)[29]	Concrete walkways	Look for uneven surfaces, ponding, growth from joints, cracking			X					
	10	Trees	Trim and fertilize				X		X		
	11	Shrubs	Trim and fertilize			X					
	12	Lawns and groundcover	Fertilize, water, mow, edge	X							
	13	Site lighting	Visually inspect, replace lamps				X				
3.2	**FOUNDATION**										
	2	Foundation walls	Examine for moisture stains, cracks, spalling. Keep vegetation cleared away from foundation walls			X					
	4	Crawlspaces	Ensure proper ventilation, check for moisture/flooding and debris			X			X		
	5	Areaways	Ensure proper ventilation, check for moisture/flooding			X			X		
	10	Slab on grade	Inspect for cracks, chips, uneven surfaces under carpet				X				

[29] Inapplicable item numbers from the Historic Properties Maintenance Checklist are omitted. The checklist is available online from Colorado Historical Society State Historical Fund Publications at http://coloradohistory-oahp.org/programareas/shf/plan.htm.

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	ITEM		TASK	W	M	Q	SA	A	ST		SAT	UN SAT
	12	Wildlife/Varmint Inspection	Check for nests, holes, animal droppings, material decay		X		X					
	13	Grade	Maintain grade away from building, especially dripline. Fill washouts.				X		X			
3.3	**BUILDING STRUCTURE SYSTEM**											
	1	Brick bearing walls	Check for cracks, missing mortar, straight and true walls. Keep vegetation from scraping and scarring walls.				X					
	8	Wood roof framing system	Check overall alignment for deflection, cracking, decay					X				
	9	Wood roof sheathing	Look for water damage, decay, fastener failure					X				
	10	Wood ceiling framing system	Check overall alignment for deflection, cracking, decay					X				
	11	Wood floor framing system	Check overall alignment for deflection, cracking, decay					X				
	12	Wood floor sheathing	Look for water damage, decay, fastener failure					X				
	13	Wood beams	Inspect for rotting wood, faulty connections, deflection					X				
	18	Concrete slab	Inspect for cracks, chips, uneven surfaces					X				
3.4	**BUILDING ENVELOPE - EXTERIOR WALLS**											
	3	Brick masonry	Look for surface salts, failing mortar, damaged bricks					X				

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	ITEM		TASK	W	M	Q	SA	A	ST		SAT	UN SAT
	6	Wood eaves, fascia and cornice	Check for flaking paint, rotting wood, secure connections				X		X			
	7	Exterior paint	Visually inspect for flaking, blistering, weathering	Re-paint every 5-7 years				X				
3.5	**BUILDING ENVELOPE - ROOFING**											
	1	Metal roofing	Inspect for loose sheet edges, deformed sheets, rust				X		X			
	7	Metal flashing	Check for loose, raised fixings; raised cappings				X		X			
	12	Sealants	Check integrity of material, water tightness				X					
	13	Brick chimney	Inspect for structural stability, capping				X					
	15	Attic vents (if installed)	Make sure unobstructed and adequate for space/climate		X							
3.6	**WINDOWS AND DOORS**											
	2	Steel windows	Check for water seepage, cracked panes, deteriorated putty	Clean every 3 months				X				
	5	Window sills	Look for water seepage, damaged bricks, loose deteriorated cement wash				X					
	8	Wood doors, frames and hardware	Inspect for damaged jambs, moldings, operational hardware				X					
	9	Metal doors and frames	Inspect for damaged jambs, moldings, operational hardware				X					
	10	Storm windows	Examine fit and connection to frame, damaged screens/glass				X		X			
3.7	**INTERIOR FINISHES**											

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	ITEM		TASK	W	M	Q	SA	A	ST		SAT	UNSAT
	1	Plaster ceilings	Visually inspect for cracks, chips, water stains				X					
	2	Plaster walls	Visually inspect for cracks, chips, water stains				X					
	15	Wood trim	Examine for damaged, missing molding, secure connection					X				
	21	Resilient flooring	Check for missing, damaged tiles, adhesion					X				
	22	Carpet	Clean; look for excessive wear, holes, tears, stains	X			X					
	23	Window coverings	Check for damage, secure connections, excessive wear/dirt					X				
	25	Metal stairs and railings	Examine alignment, look for excessive wear, deterioration					X				
	26	Wood casework	Check for rotting, decaying wood, operational hardware					X				
	27	Interior paint and/or clear finishes	Look for flaking, dirt, water stains or blistering	Re-paint every 5-7 years				X				
	28	Interior glazing	Check for cracked or broken glass					X				
3.8	**ARCHITECTURAL FEATURES**											
	7	Porches and balconies	Look for level surfaces, alignment, dirt, damage					X				
	8	Fireplaces (wood stove)	Inspect damper, flue for operability/cleanliness					X	X			
	9	Built-in furniture	Look for alignment, dirt, damage					X				
3.9	**MECHANICAL SYSTEMS**											
	2	Water heaters	Look for leaks, drain to reduce sediment build-up			X						

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	ITEM		TASK	W	M	Q	SA	A	ST	SAT	UN SAT
	3	Furnace	Check temperature setting, safety mechanisms, change filter (State inspection annually)			X		X			
	4	Metal ductwork	Inspect for holes, loose connections			X					
	12	Plumbing waste and vent piping and fittings	Visually inspect for leaks, corrosion, damage					X			
	13	Plumbing supply piping and fittings	Visually inspect for leaks, corrosion, damage					X			
	14	Plumbing fixtures	Inspect for drips, leaks, ease of operation					X			
	15	Septic Tank	Pump contents every 3-5 years					X			
	17	Kitchen equipment / disposal	Inspect for drips, leaks, ease of operation					X			
	18	Utilities (water, heating, sewer, etc.)	Ensure regular inspection by a qualified professional					X			
3.10	**ELECTRICAL SYSTEMS**										
	1	Electrical service entrance	Keep free of obstructions, dirt					X			
	3	Distribution panels	Make sure accessible, inspect for corrosion, dirt, cobwebs					X			
	4	Interior incandescent light fixtures	Check bulbs, fittings, wall connections	X							
	5	Interior fluorescent light fixtures	Check bulbs, fittings, wall connections	X							
	6	Exterior light fixtures	Visually inspect, replace lamps					X			
	7	Electrical outlets	Inspect for damage, secure plate connection					X			
	8	Communications systems	Ensure proper operation					X			
	10	Electric baseboard heat	Examine register for secure connections, damage, dirt debris				X				

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	ITEM		TASK	W	M	Q	SA	A	ST	SAT	UN SAT
4.1	**LIFE/SAFETY**										
	1	Fire extinguishers	Test proper operation				X				
	2	Fire alarm system	Test proper operation				X				
	3	Smoke detection systems	Test proper operation				X				
	8	Lead paint	Prevent flaking, excessive dust, exposure to children	As Appropriate							

APPENDIX C - SECRETARY'S STANDARDS

Secretary of the Interior's Standards for Rehabilitation

REHABILITATION IS DEFINED As the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values.

1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.

2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.

3. Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.

4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.

5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.

7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

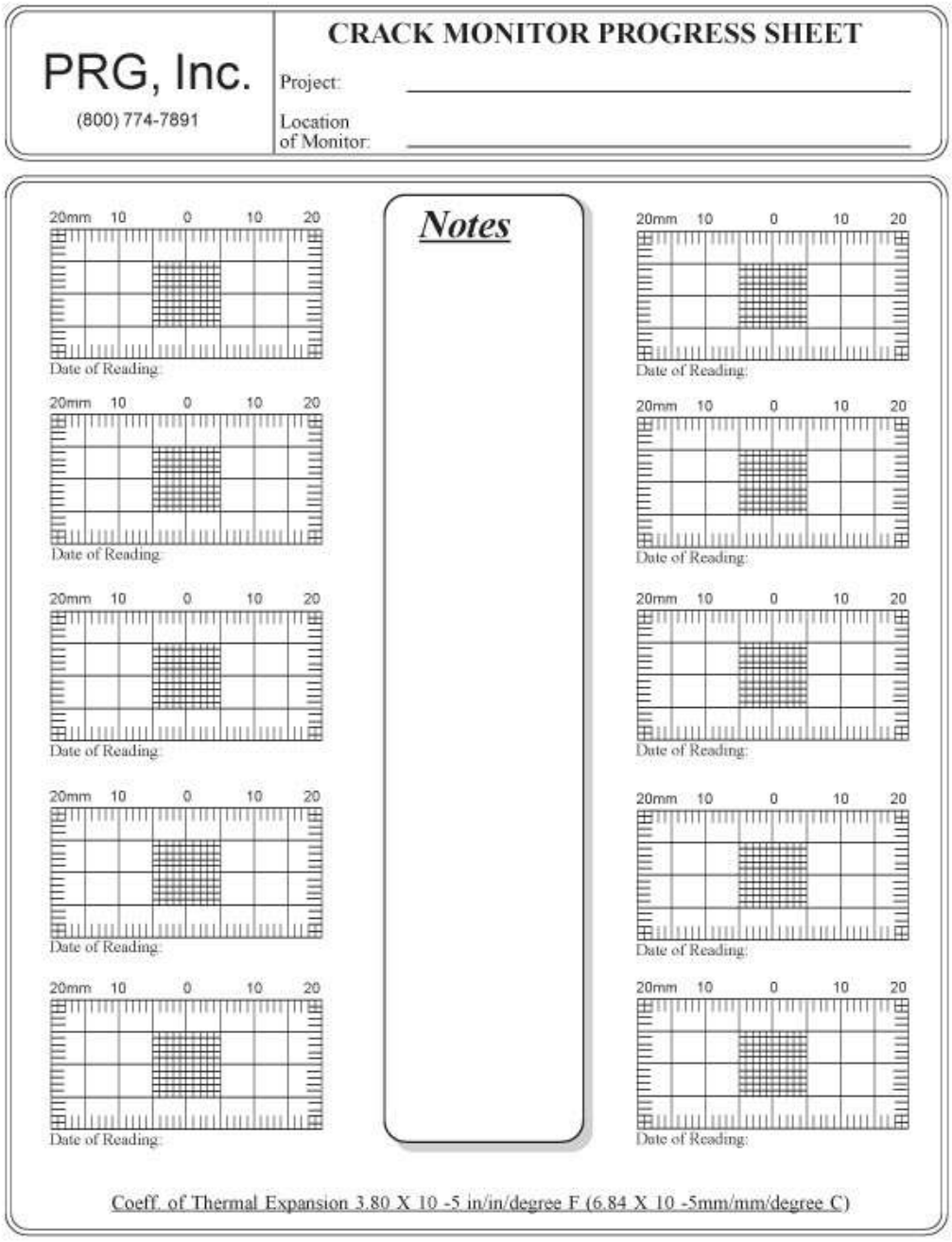
8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measure will be undertaken.

9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work will be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.

10. New additions and adjacent or related new construction will be undertaken in a such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

REHABILITATION AS A TREATMENT. When repair and replacement of deteriorated features are necessary; when alterations or additions to the property are planned for a new or continued use; and when its depiction at a particular period of time is not appropriate, Rehabilitation may be considered as a treatment.

APPENDIX D - CRACK MONITORS



Installation

Avongard Crack Monitors

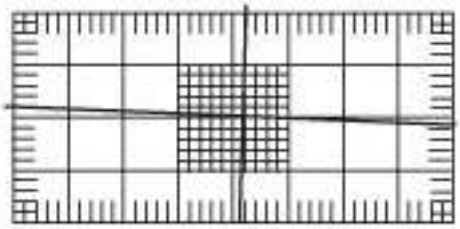
TOLL-FREE ORDER LINE - (800) 774-7891

Calibrated Crack Monitor Installation Instructions

ANCHORS & BOLTS/SCREWS

1. Place Monitor over crack and mark position for anchors.
2. Drill holes for anchors.
3. Attach monitor with bolts or screws, ensuring that red crosshairs center on grid.
4. Cut tape and remove from monitor.
5. Note location of monitor on crack progress sheet.

Sample grid from Crack Progress Sheet



EPOXY ADHESIVE

1. Clean concrete/masonry surface to remove debris.
2. Use quick setting epoxy
3. Apply epoxy to back of both monitor plates, following directions on epoxy package.
4. Press monitor in place across crack.
5. Make sure red crosshairs are centered on grid. Adjust if necessary.
6. Use duct tape to hold gauge in place till epoxy cures.
7. After epoxy cures, cut clear tape and remove from front of monitor.
8. Note location of monitor on crack progress sheet.

APPENDIX E - PRESERVATION BRIEF 13