

Historic Housing Area Historic Structures Report

HS-11 Upper Garage

Wind Cave National Park



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Susan Richards Johnson & Associates, Inc.
1701 Oak Street, Suite 100
Kansas City, Missouri 64108



Cover Photo:

HS-11 Upper Garage Existing Structure, View East. (SRJA 2014)

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Introduction

Volume I of the Wind Cave National Park Historic Housing Area Historic Structures Report (HSR) covers the history of the development of the park and the historic housing area. This individual Volume VIII is to serve as a guide for the future caretaking of this significant property, HS-11 Upper Garage. This volume focuses on the individual history, review of existing conditions and treatment recommendations unique to HS-11.

The two-story HS-11 Upper Garage was built in 1934 as a garage and shop. The 2,000 square feet garage building was built into the hillside and has five bays on the lower level, which faces east toward the Administration Building, and four bays and a workshop on the upper level, facing west (Figures 6 and 7). This garage structure is in nearly original condition, with very few alterations. The building is visible from the public right of way and should be preserved in its current condition to the extent possible.

The shell of the HS-11 is in overall good condition, having been very well maintained for the last 81 years. However, the second level of the garage has been deemed unsafe for parking until temporary shoring or permanent repairs can be made. The garage has been taking on water for years at the second level garage doors. A rise in the grade along the west elevation, and poor detailing at the garage door entrances, has led to significant water infiltration and the deterioration of the second floor joists. This is a critical repair that is required for the garage to continue its intended use. The second major issue is the deteriorated condition of the steel windows and wood sills. With the preservation of the building's most significant features, great care shall be taken to stabilize the building in the gentlest means possible.

HS-11 is experiencing structural failure along the west wall floor framing of the second level and is in immediate need of repair. With the ultimate treatment recommendation to *Rehabilitate* the building, the structural stabilization of this building is critical. Great care shall be taken to stabilize the building in the gentlest means possible, while preserving the building's most significant features.

Significant Features

Care should be taken to preserve the following significant historic features routine maintenance and through future rehabilitation projects.

Exterior:

- Site - Sloping site surrounding the building on both sides.
- Massing - Overall shape of the building (long, rectangular two-story built into grade with a gable roof).
- Roofline – Long gable roof.
- Basic Footprint – Rectangular, buried in grade.
- Stonework – Native stone foundation with battered walls, laid in a random ashlar pattern. Stone curbing at sides of the driveway.

- Exterior Finish – Spanish stucco. Horizontal wood siding and wood louvers in the gables.
- Doors – The masonry door openings on the lower floor are original. The doors are not original but convey the historic feeling of the original doors. The upper door openings are original, but the doors are not.
- Exterior Trim – Cornice. Exposed timber girder on east elevation above doors.
- Fenestration – Steel windows.

Interior:

- Exposed wood framing at walls, ceiling and roof.
- Open bay garage construction in upper and lower garages.

History and Significance of HS-11 Upper Garage

Note: See Volume One for a full bibliography and additional information about the early development of the Historic Housing Area of Wind Cave National Park.

HS-11, now known as the Historic or Upper Garage, was built in 1934 to serve as a machine shop and garage (Figures 5-7). Plans for a “Machine Shop Shed” were completed by “R.W.A.” of the National Park Service Branch of Plans and Design in September 18, 1933. The building was constructed by the Hot Springs Lumber Company between April and August of 1934. It was one of three buildings in the housing area to be constructed in the same four month period; the Hot Springs Lumber Company also built HS-06 and HS-03 as part of the same contract.¹

Like the other buildings erected during the period of significance, the Machine Shop utilizes the distinctive combination of stucco and native stone that typifies the buildings erected at the park in the 1930s. The garage was built at the request of Superintendent Edward Freeland, who noted the need for an attractive and functional building in his 1931 Annual Report, saying that “the present old, unsightly, and inadequate barn and auto shed should be replaced by a combined machine shop and shed conforming in exterior design to the style approved for this park by the Landscape Division.”²

The new machine shop lived up to his expectations; a year after it was completed, he reported that the new work space had allowed him to have the old buildings removed from public view as he had planned, and that the new machine shop and garage made “possible the proper housing of automotive equipment and provided a small work shop for equipment repairs.”³ The garage was built with an unusual combination of door types; those on the lower level were built to swing out, while those on the top level were made to slide open.

HS-11 has seen no additions or significant structural alterations of note since 1934. It is a contributing resource in the Wind Cave Historic District and it is significant as the largest historic garage in the historic housing area.

¹ 1934 Superintendent's Monthly Report, Wind Cave National Park. (Copy on file at the WICA Library.) Hereafter referred to by month and year as WICA Superintendent's Monthly Report.

² 1931 Superintendent's Annual Report, Wind Cave National Park. (Copy on file at the WICA Library.) Hereafter referred to by year as WICA Superintendent's Report.

³ 1935 WICA Superintendent's Annual Report.

Current Title: HS-11 Upper Garage FMSS Asset Number 27937 LCS ID 010747		
Previous Name	Date of Name	Source of Name and Notes
Machine Shop Shed	1933	Plans, Annual Reports
Storage Shed and Garage	1940	1940 Master Plan
Garage and Storeroom	ca. 1949-1995	Maintenance Department Files
Garage	1963	1963 Site Plan
Garage (also says "Formerly called Supt's Garage.")	1976	Classified Structure Field Inventory Report
Garage (Residential District) 1931	1988	1988 Management Plan
Machine Shop Shed (HS-11)	1995	National Register Nomination
Historic Garage	2000	Current WICA Staff, LCS
H-B-9 Garage (Machine Shop Shed) (HS-11)	2005	Cultural Landscape Report
Building 11	2006	Plans

Figure 1. Table of Previous Names

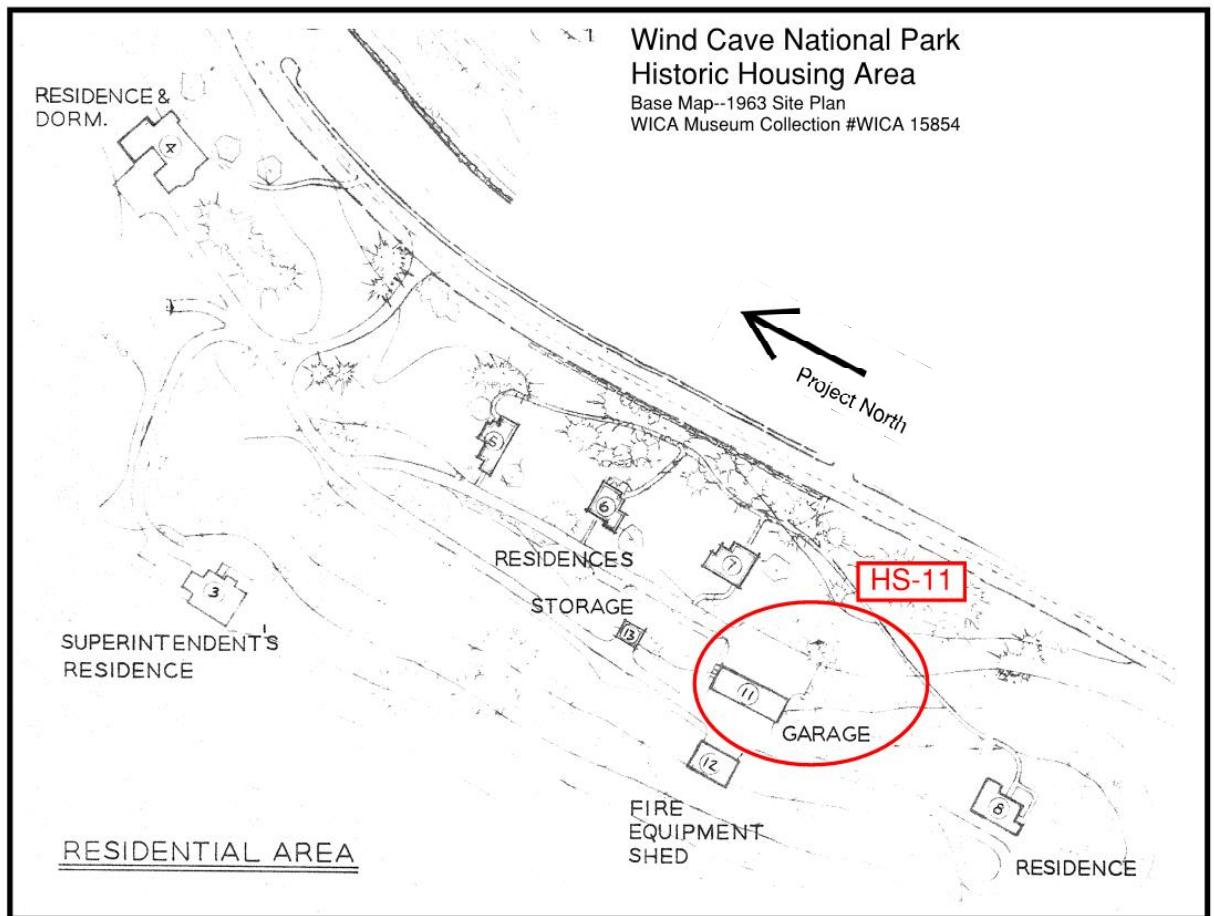


Figure 2. Location Map

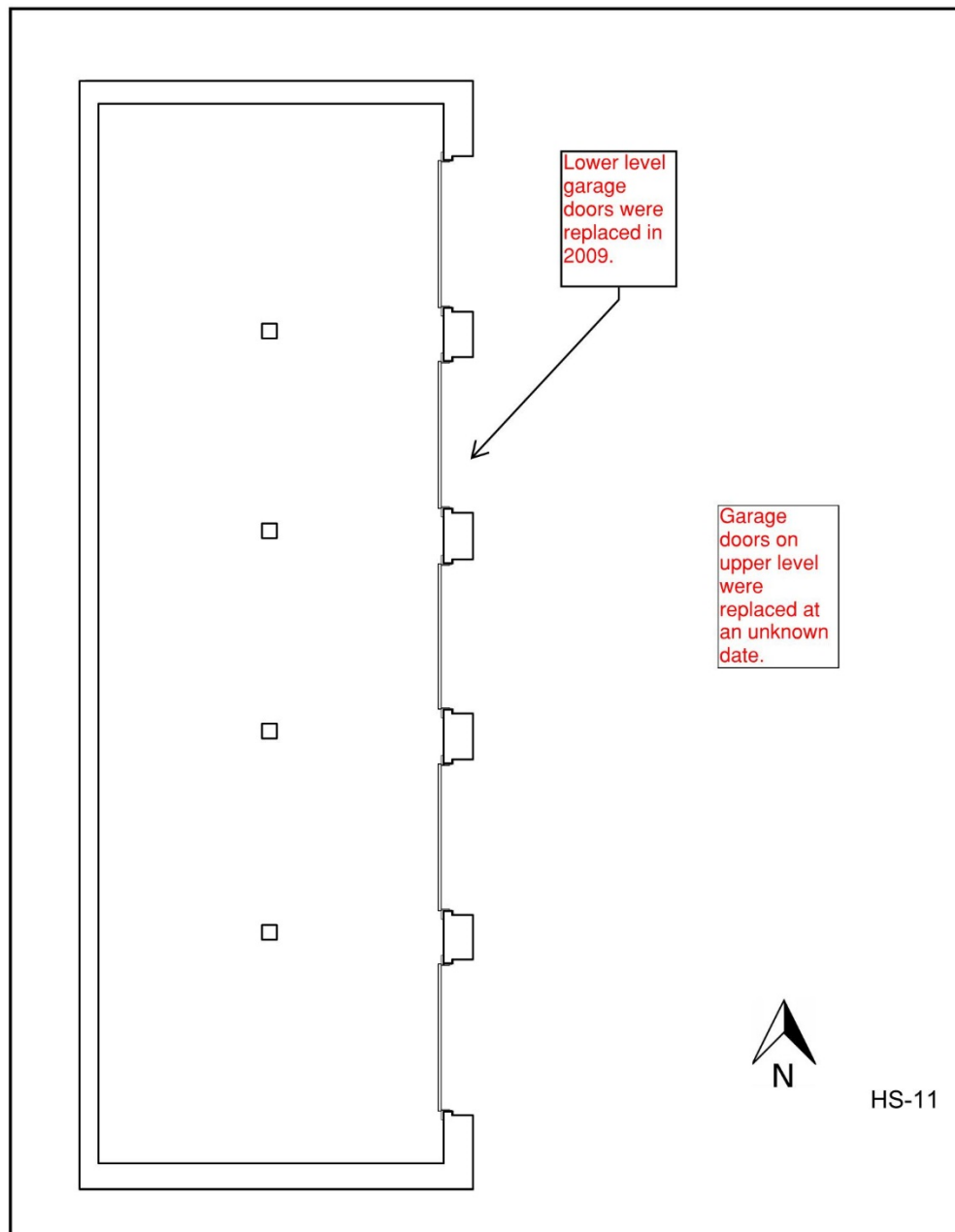


Figure 3. Summary of Alterations

Timeline of Major Events and Alterations.

Historic Primary Function Use: Secondary Structure (Garage) [List of Classified Structures.]

Current Primary Function and Use: Secondary Structure (Garage) [List of Classified Structures.]

1933

September 18, 1933. Plans completed for Machine Shop Shed (HS-11). Plans were drawn by "R.W.A." of the National Park Service Branch of Plans and Design, recommended by Edward A. Nickel, for the Chief Architect, 3/21/1933, and approved by Arno B. Camerer, Director on 1/6/1934. [Appendix A.]

"Master Plan narratives indicate that the building was planned as a 'Machine Shop Shed and garage' which was planned to house park equipment and employee's cars. [Karsmizki, "Administrative and Utility Area NR Nomination," 7.56.]

1934

April 6, 1934. Contract let to Hot Springs Lumber Co, for "two residences and a machine shop." \$19,475.69. (HS-03, HS-06, HS-11) [April, 1934 WICA Superintendent's Monthly Report.]

Original Cost \$12,600.00 [Maintenance Department Files.]

August 11, 1934. HS-11 completed. [Appendix A.];[1934 WICA Annual Superintendent's Report]

1949, ca.

Value \$7,500.00. [Maintenance Department Files.]

1953

July. Doors repaired, painted. [Maintenance Department Files.]

1954

January. Underground power lines laid. [Maintenance Department Files.]

1975

Altered. [List of Classified Structures.]

1986

July. Building transferred from G.L. acct. 210 General Buildings to G.L. acct. 215 Historical Buildings. (Recorded date 16 Apr 1987) [Maintenance Department Files.]

1988

January. Permanently install new electric heat w/ thermostat. (Recorded 14 Nov 1988) [Maintenance Department Files.]

1993

October 1, 1993. Structure Ultimate Treatment (UT): Restoration. Not approved. Not completed
[List of Classified Structures.]

1998

Structural evaluation. [Maintenance Department Files.]

1994

Rehab and repaint doors. [Maintenance Department Files.]

2002

Re-roofed as part of six-building Contract C1505010058. [Maintenance Department Files.]

2009

Replaced doors. [Maintenance Department Files.]

Historic Photos



Figure 4. HS-11, ca.1930s, looking west. (WICA 4208)



Figure 5. HS-11, ca.1934, looking west. (WICA 4119)



Figure 6. HS-11, ca.1935, looking northwest. (WICA 4559)



Figure 7. HS-11, ca.1938, looking northeast. (WICA 4129)



Figure 8. HS-11, ca.1940, looking northeast. (WICA 4557)



HS-11 Northeast Corner. (SRJA 2014)

Existing Conditions

Existing Conditions – Architectural

Completed in 1934, the two-story Upper Garage is constructed with a combination of reinforced concrete and stone foundation walls built into the hillside. The upper frame walls are clad in stucco and the gables are clad in horizontal wood siding. The building has a gable roof running in the north-south direction. The exterior wood cornice and trim throughout the building matches the other buildings in the historic housing area from this period. The footprint of the building is 1,308 gross square feet. With two floors, this represents approximately 2,300 gross square feet of garage storage and 300 gross square feet of workshop space.

Mechanical, Electrical and Plumbing assessment was not completed for this building.



Figure X1. East Elevation. (SRJA 2014)

East Elevation

The two-story east elevation is visible from the public right of way (Figures X1- X5). The lower level is exposed native stone laid in a random ashlar pattern. There are a total of five garage bays. A large three-piece wood girder spans these openings. The stone masonry is in very good overall condition, requiring only spot repointing, cleaning, paint removal and repairs to the mortar wash at the top of the wall. A few stones near the concrete are fractured due to the lack of a soft joint between the stone and the poured concrete drive. This is due to expansion and contraction of the concrete. A metal threshold is embedded in the concrete of the north bay. This is the only door with this type of threshold. This installation may have been done to block

water from backing up into the interior of this bay due the presence of the downspout draining in the front of this door opening.

The existing overhead garage doors replaced the original wood doors in 2009. The original doors were out-swinging 2 ½-inch thick Douglas fir doors with painted iron T-hinges. Each of these doors had 8 glass lites and four recessed panels with diagonal tongue and groove boards. A detail photograph of the lower right corner of one of these doors can be found in the LCS file. The lower doors that faced the Visitor's Center were designed to be more formal with the glass and recessed diagonal board panels, while the doors on the second level that faced west and were not viewable from the public right of way, were more utilitarian with no glass lites in the original design.

The stucco walls on the second level of the east elevation are in overall good condition. Some minor diagonal cracking is visible at the corners of the second level windows. Window 103 in the fourth bay from the north has broken glass and the frame and stucco wall is slightly bowed. At the time of this report, the vehicle parked in the garage was backed against the wall and was touching the exposed wood studs below the window. The broken glass and bowed wall are likely from repetitive contact with this wall from vehicles. The wood trim appears to be in good condition requiring only touch-up painting.

An old light socket is located above the central door. Presently there is no fixture installed. The early photographs of the building do not show a fixture at this location. However, a photograph in the Maintenance File does show an enamel light fixture that matches the one currently installed on the north elevation and also one that was previously installed at HS-12 across the road. The date of the photograph in the Maintenance File is unknown.



Figure X2. East Elevation detail at stone pier. Note the girder splicing above this pier. The bottom right stone is fractured from the expansion and contraction of the driveway poured directly against the stone. (SRJA 2015)



Figure X3. East Elevation detail at northeast corner. Note the stucco crack at the corner. (SRJA 2015)



Figure X4. East Elevation detail at the north bay threshold. Note the cracked concrete threshold, the embedded steel threshold and downspout. (SRJA 2015)



Figure X5. East Elevation detail at stone curbing. (SRJA 2015)



Figure X6. South Elevation. (SRJA 2014)

South Elevation

The south elevation has a steep grade change which is evident by the exposed stone foundation. The foundation is nearly full height at the east side and the grade is well above the top of the stone foundation wall at the west side. The stone foundation along this elevation is in good condition, requiring only spot repointing, cleaning and mortar wash repair/replacement at the top of the foundation wall. There are some minor stucco cracks on this elevation with some missing stucco at the southeast corner near the foundation. In this location, the wire lath has been exposed and is painted. The grade being in contact with the stucco walls is not ideal near the southwest corner of the building.

The electrical meter is located on this south-facing wall near the west side of the building. The horizontal wood siding and trim located in the gable are in fair condition. The louvers appear to be in good overall condition. It was not confirmed if they have adequate screening in place.



Figure X7. South Elevation detail at southeast corner where missing stucco has exposed metal lath. (SRJA 2015)



Figure X8. South Elevation detail with grade above the foundation wall in contact with the stucco cladding. (SRJA 2015)



Figure X9. South Elevation detail of louvers. (SRJA 2015)



Figure X10. West Elevation. (SRJA 2014)

West Elevation

The west elevation is a secondary side of the building, not viewable from the Visitor's Center below. This one-story elevation provides access to the second level of the garage with four bays and a workshop (Figures X10 – X17). The biggest issue facing this side of the building is the asphalt road adjacent to the building. Through the years, the elevation of this road has risen, making it nearly level with the second level finish floor. This creates a myriad of drainage issues, including water infiltration into the building, which is evident through deterioration of the second level floor framing system. The building was originally designed to have a separate concrete approach which may still be in place but has likely been covered with the layers of asphalt.

The existing overhead garage doors were installed in 1994 and are in fair condition. They are starting to show signs of deterioration even though they have been very well maintained. The original doors for this side of the building were designed as recessed eight-panel doors with diagonal tongue and groove boards. These were shown to be out-swinging doors in the original construction drawings, but historic photographs of the doors show they were otherwise. The large doors were not built with a seam down the middle for opening. They were built as a single unit. Two photographs of this side of the building in 1940 show the garage bays with two different stages of the doors open. These photographs indicate that these were sliding, or bypass, doors. The middle two doors slid on the inside face of the outer two doors. This meant, at most, only two doors could be opened at once.

A soffit board is loose above the first garage door from the south (Figure X14). There were bees flying in and out of this area during the November 2014 site visit. The remainder of the wood trim is in good condition, requiring only touch-up painting.

The existing steel exterior Door 201/1 that leads to the Storage Room 200 is not original to the construction of the building and the date of its installation is unknown. The original door was wood with four lites and a single recessed panel (Figure 7).

The stucco on this elevation is in fair condition. There is some crazing near the concrete on the south side of the west wall. There is no soft joint installed between the stucco cladding and the asphalt driveway (Figure X12). There is some missing stucco at base of the walls between the first and second garage bays and also at the north side of the northernmost bay (Figure X13). There is some diagonal cracking at the head of the door and near the base of the door. The southernmost downspout is crushed. Both downspouts on this side drain directly to the asphalt pavement abutting the building. The gutter on the south side is run short of the roof and therefore cannot pick up the edge of the roof drainage (Figures X15 – X16). The exposed drip edge on the west side is unfinished galvanized sheet metal.



Figure X11. West Elevation detail at the garage.
(SRJA 2015)



Figure X14. West Elevation detail of loose soffit.
(SRJA 2015)



Figure X12. West Elevation detail of joint
between asphalt drive and building. There is no
soft joint installed. (SRJA 2015)



Figure X15. West Elevation detail of south side
of the gutter that is short of the roof.
(SRJA 2015)



Figure X13. West Elevation detail of missing
stucco at base of pier and exposed wire lath.
(SRJA 2015)



Figure X16. West Elevation detail of the south
side of the gutter that is run short of the roof,
photograph taken looking north. (SRJA 2015)



Figure X17. North Elevation. (SRJA 2014)

North Elevation

The north elevation has a steep grade change which is evident in the exposed stone foundation (Figures X17 – X21). The foundation is nearly full height at the east side and flush with the top of the stone foundation wall at the west side. The stone foundation along this elevation is in good condition, requiring only spot repointing, cleaning, spotty paint removal and mortar wash repair/replacement at the top of the foundation wall. There is one stone near grade that has fractured and requires replacement (Figure X19). There are some minor stucco cracks on this elevation with some small holes in the plaster located near the utility box that require patching (Figure X20).

The horizontal wood siding and trim in the gable is in fair condition. There is a gap in the cornice at the northwest corner. The louvers appear to be in good overall condition. It was not confirmed if they have adequate screening in place.

An enamel shade light fixture is mounted near the northwest corner which provides lighting for the concrete stairway. This light is consistent with other lighting found on site, including one that used to be installed on HS-12 and one that was previously installed on the east elevation of HS-11.

An in-grade concrete stair provides access from the lower level driveway to the upper level driveway. The stairway has a painted handrail on both sides.



Figure X18. North Elevation foundation detail.
(SRJA 2014)



Figure X20. North Elevation stucco detail.
(SRJA 2014)



Figure X19. North Elevation stone foundation
deterioration detail. (SRJA 2014)



Figure X21. North Elevation detail at northeast
corner. (SRJA 2014)

Roof

The existing asphalt shingle roof was installed in 2002 and is in good overall condition. The roofing is a Heritage 40 Laminated Asphalt Shingle, manufactured by Tamko Roofing in the Rustic Cedar color. The flashing, pre-finished aluminum K-style gutters and corrugated downspouts were installed at this time, as well. The downspouts drain to daylight above grade. The original 1934 construction documents specified 24-inch wood shingles with a 10-inch exposure.

In historic photographs, a flue extends through the west side of the roof from the storage room. This was probably from a heating stove in this space which has since been removed. There are no penetrations in the existing roof except for the electrical weatherhead coming through the west side of the roof between the first and second bays to service HS-12 with overhead lines. This building also serves as the main electrical distribution for HS-13. The electrical service between HS-11 and HS-13 is buried below grade.

At the time of the November 2014 survey, the east gutters were filled with pine needles.

Steel Windows

The seven steel windows in the north, east and south elevations are original to construction. These nine lite windows with a six lite upper operating sash are in poor condition overall (Figures W1 – W4). They are missing paint, exhibiting corrosion, have broken glass and require new glazing putty. There are many layers of paint built up on the frames. The window paint and glazing putty should be tested for lead based paint and asbestos prior to any rehabilitation work. The windows are installed on top of wood sills that are also showing signs of decay. Several of the sills will require full replacement or epoxy repairs.



Figure W1. Interior window detail. Note the missing glazing putty. (SRJA 2015)



Figure W2. Window 103 Detail with truck bumper against window frame. Note the deteriorated wood sill on the exterior of the window. (SRJA 2015)



Figure W3. Interior Window 106 detail. Note the deteriorated glazing putty. (SRJA 2015)



Figure W4. Interior Window 104 detail. Note the missing glazing putty and deteriorated exterior sill. (SRJA 2015)

Interior

Room 100

The Garage 100 is comprised of a total of five garage bays and encompasses the entire lower level of the building (Figures 1-1 – 1-6). The garage is one open space. The second floor framing is all exposed. A large girder runs the length of the building from north-south, bisecting the garage into two halves. The girder is supported on the ends by the stone foundation walls and by posts between each garage bay which are resting on small piers. The north and south foundation walls are rubble stone and the rear west wall is concrete. All walls are painted yellow. Water infiltration due to the issues with the detailing at the garage door thresholds above have led to the water staining across the west wall. The west concrete wall has a wood sill plate that supports the floor joists. The deterioration of the ends of the joists and the sill plate are discussed in the Structural Section of this report. The floor is a concrete slab on grade and exhibits normal wear due to its age. There are minor cracks, but no significant issues. Much of the finished floor could not be viewed due to the large amount of equipment stored in the garage at the time of the survey.

The overhead door operating system is mounted directly to the underside of the second level framing. In addition to the overhead door equipment, single light porcelain fixtures are installed in the center of each garage bay on the bottom side of the girders. Electrical is run through exposed metal conduit.



Figure 1-1. Garage 100 Looking north and east. (SRJA 2014)



Figure 1-2. Garage 100 Looking south and east. (SRJA 2014)



Figure 1-3. Garage 100 North end of girder pocketed into the north wall. (SRJA 2014)



Figure 1-5. Garage 100 Detail of west wall. Note the deteriorated blocking between the joists. (SRJA 2014)



Figure 1-4. Garage 100 Looking west at second level floor framing, girder and west concrete foundation wall. (SRJA 2014)



Figure 1-6. Garage 100 Water infiltration in the southwest corner where the south stone foundation wall intersects with the west concrete wall. (SRJA 2014)

Room 200

Room 200 is comprised of the north three bays of the second level of the garage (Figures 2-1 – 2-9). The exterior wall framing and roof framing are visible throughout the space. The diagonal exterior sheathing is visible through the open 2x4 wood stud walls. The roof trusses are visible. There is no building insulation in this section of the building. Signs of previous water infiltration are evident on the interior of the wall sheathing and studs (Figure 2-5 and 2-7). The wood frame

wall between the Garage 200 and the adjacent Workshop 201 is vertical unpainted wood wall sheathing. The exposed underside of the roof sheathing appears to be in good condition.

The floor is comprised of several layers of materials. Over the floor joists, there appears to be metal panning, which is topped with several inches of sloped asphalt. At the entry doors, the asphalt is very thin, while along the east side of the wall, it appears to be as thick as 6-inches. A damaged section near the garage entrance shows the cross section of the flooring system (Figure 2-6). The asphalt is in fair overall condition, exhibiting some loss near the garage entries. There are also some large depressions in the asphalt where tires have rested (Figure 2-9). Some of these are several inches deep. The condition of the flooring and concrete foundation wall at the garage entry which is causing significant water infiltration issues is discussed in detail in the Structural Section of this report.

The room is lit with four steel windows along the east wall and one window in the north wall. Window 103 in the east wall has a broken pane of glass, as mentioned in the East Elevation section above. This is the location where the truck is backed in and touching the wall.

The overhead door operating system is mounted directly to the underside of the roof trusses. In addition to the overhead door equipment, single light porcelain fixtures are installed in the center of each garage bay. These fixtures are surrounded with wire cages to prevent the bulbs from breakage. Electrical is run through exposed metal conduit. A sub-electrical panel with the circuits for the overhead doors, receptacles, a light switch and a fire extinguisher are all mounted on the north wall.



Figure 2-1. Garage 200 Looking at south wall.
(SRJA 2014)

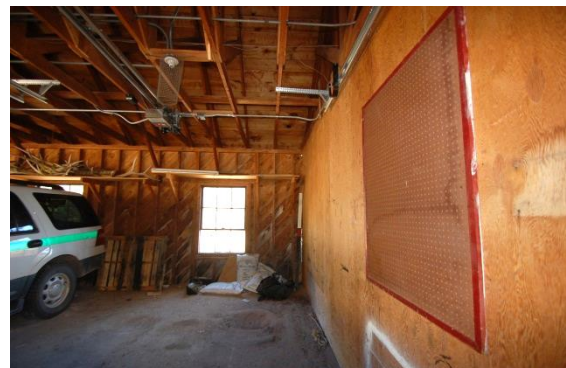


Figure 2-2. Garage 200 Looking towards east wall.
(SRJA 2015)



Figure 2-3. Garage 200 Looking south along east wall. (SRJA 2015)



Figure 2-6. Garage 200 Detail at hole in floor near garage doors. (SRJA 2015)



Figure 2-4. Garage 200 Looking north. (SRJA 2015)



Figure 2-7. Garage 200 Looking at detail of north wall. Note the moisture staining on the interior wood framing and sheathing surfaces. (SRJA 2015)

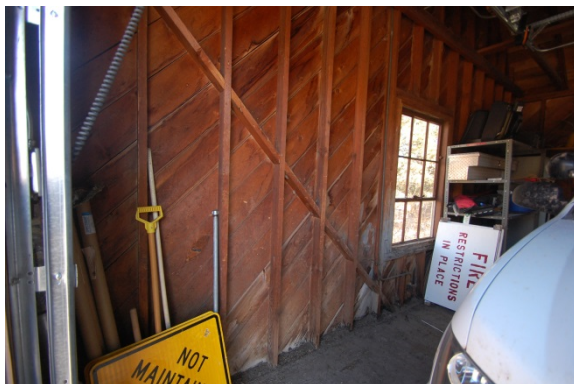


Figure 2-5. Garage 200 Looking east along north wall. (SRJA 2015)



Figure 2-8. Garage 200 Looking at lighting. (SRJA 2015)



Figure 2-9. Garage 200 Looking at deep depression in the asphalt in the south garage bay. (SRJA 2015)

Room 201

Room 201 is a workshop and storage room which is approximately 300 square feet. This room fills the southern-most bay of the second level. This space was originally designed as a workshop. The exterior walls and ceiling are painted sheets of wood. The interior north wall is finished with horizontal painted boards.

The electrical panel is located on the north wall of Storage Room 200 and the date of installation is unknown (Figure 2-10). The original fuse box is now used as a junction box. The electrical panel serves this building HS-11, as well as HS-12 across the road and the adjacent HS-13 building. Service to HS-12 is provided by overhead lines across the road, while the service for

HS-13 is below grade. The electric heat and thermostat were installed in 1988. Light is provided by two hanging fluorescent fixtures that have been retrofitted to take power from two single porcelain sockets in the ceiling (Figures 2-12 and 2-15). The floor is painted over and asphaltic or granular material, and the paint is peeling (Figure 2-16). The room is naturally lit by two steel windows. An access panel is located in the northwest corner of the ceiling for access into the roof framing area above. It is not known if this room is insulated.



Figure 2-10. Room 201 Looking west and north.
(SRJA 2014)

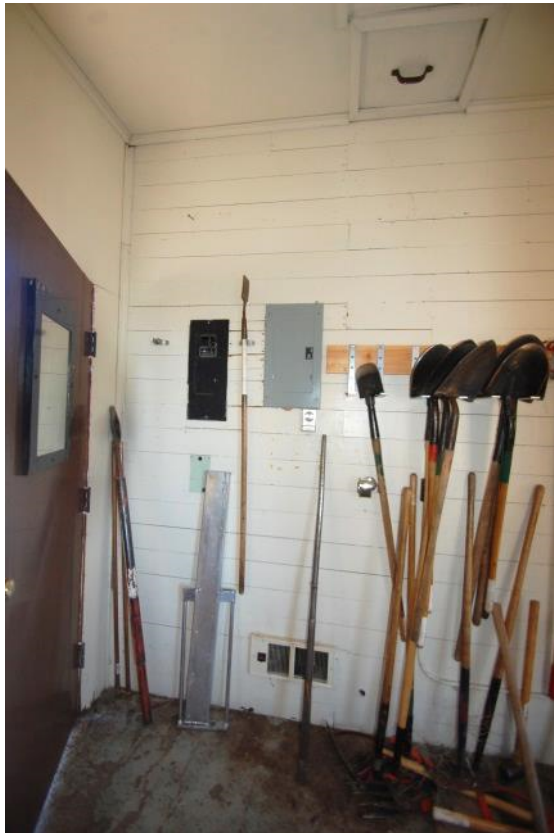


Figure 2-11. Room 201 Detail north wall.
(SRJA 2014)



Figure 2-12. Room 201 Looking east.
(SRJA 2014)



Figure 2-13. Room 201 Looking east and south.
(SRJA 2014)



Figure 2-14. Room 201 Looking west.
(SRJA 2014)



Figure 2-16. Room 201 Floor detail. (SRJA
2014)



Figure 2-15. Room 201 Ceiling light fixture
detail. (SRJA 2014)

Existing Conditions – Structural

HS-11 is primarily wood framed construction with concrete and stone foundation walls and footings. The building consists of two stories. Both levels are currently serving as a garage and the south bay on the second floor is a workshop. Based on review of the original construction drawings, it appears as if this was its original intended use.

Level One

Level one is a garage level and is currently being used to park and store yard and maintenance equipment (Figure S1). The west foundation wall is constructed of cast in place concrete. The north, south and east foundation walls are constructed of unreinforced stone. The north, south and west elevations are in contact with grade. The east face has stone pilasters with timber girders over the door openings (Figure S2). The floor is a concrete slab-on-grade. Wood girder timbers span over the door openings and support the floor framing and wall framing above. The girders are spliced over the two center pilasters (Figure S3). The girders over the door openings display some splitting, but it does not appear to be affecting their performance (Figure S4). No excessive deflection was noted.



Figure S1. Lower garage level. (SEA 2015)



Figure S2. East Elevation. (SEA 2015)



Figure S3. Girder splice over stone pilaster. (SEA 2015)



Figure S4. Splitting in north girder. (SEA 2015)

Some cracking is present in the west concrete foundation wall but it is minor and does not pose a structural concern at this time. Water staining from the top of the west foundation wall is present from water entering over the top of the wall. This makes it difficult to determine if the minor cracks in the west foundation wall are leaking, but they appear to be dry (Figure S5).

A wood sill plate runs along the top of the west foundation wall. At some locations, there is a gap below the sill plate.



Figure S5. West foundation wall. (SEA 2015)

Level Two

Level Two is currently being used to park vehicles in the north four bays. Overhead garage doors are present on the west face of the structure on this level. Vehicles present at the time of observation ranged from a mid-sized car to a $\frac{3}{4}$ ton or 1-ton pick-up truck (Figure S6).



Figure S6. West Elevation. (SEA 2015)

The floor framing consists of 2x12 (nominal) joists at 12-inches on center spanning from the west wall to a center 10 x 12 (nominal) timber girder, then from the girder to the east wall. Bridging is present on between the floor joists. The floor consists of 1 x wood decking with an asphalt overlay. From limited observation, it appears as if there is a metal deck material present immediately above the wood deck material (Figure S7). It is unknown if the metal deck is continuous or if is just located at the joints in the wood deck. The precise thickness of the asphalt topping is unknown, but it appears to range in thickness from one-inch or less at the west face to approximately six-inches at the east wall.



Figure S7. Metal above Level 2 wood deck. (SEA 2015)

The timber girder is supported by (4) 10x10 (nominal) timber posts. The 10x12 (nominal) girder is spliced over the two interior posts. There is a steel plate on top of the post that the timber girders bear on (Figure S8).



Figure S8. Girder splice on steel plate over post. (SEA 2015)

The timber posts bear on a small concrete pilaster at the slab-on-grade level (Figure S9).



Figure S9. Post bearing on pilaster. (SEA 2015)

The floor joists are stained extensively at some locations, but the staining appears to be consistent with an asphaltic product such as bitumen that may have been used on the deck as a bonding agent for the asphalt (Figure S10). Deterioration in the wood joists is not visibly evident with the exception of the bearing location on the west foundation wall.



Figure S10. Asphalt stained floor joists. (SEA 2015)

The asphalt topping is present in the four parking bays. It has deteriorated at some locations along the west foundation wall and the wood decking below is deteriorated (Figure S11). At one location observed near the east wall there is a deep depression in the asphalt similar to a pot

hole (Figure S12). It appears as if this is where the wheel of a vehicle has set repeatedly over time.



Figure S11. Deteriorated asphalt and wood deck. (SEA 2015)



Figure S12. Depression in asphalt. (SEA 2015)

Along the west foundation wall, there is a concrete ledge. A wood sill plate is anchored onto the ledge, and the 2 x 12 (nominal) floor joists bear on the sill plate. 1x blocking is present between the floor joists and is placed against the face of the concrete foundation wall. As constructed, the top of the west foundation wall slopes inward towards the building (Figure S13). This creates a condition where rainwater or snow melt runs across the top of the west foundation wall down to the ledge and onto the west end of the floor joists. This has led to severe rot of the joists at the bearing locations. Several of the floor joists are exhibiting severe rot and are easily probed

with a flat screw driver (Figure S14). The sill plate is not exhibiting the same level of deterioration, but there is concern that the bottom sides of the sill plates could also be deteriorated. This deterioration should be addressed as it could lead to a structural failure of the floor framing along the west wall.



Figure S13. Detail at west foundation wall. Note: the asphalt drive is too high at the edge of the exposed concrete wall. This will not allow for the water to divert away from the building properly. There is no lip or offset at the building entry. Also, the top of the exposed wall is sloping in towards the building. (SEA 2015)



Figure S14. Deteriorated joist end at west foundation wall. (SEA 2015)

The wall framing is typical 2 x 4 (nominal) wood construction with 2x bracing for lateral loads (Figure S15). No defects were noted in the wall framing.



Figure. S15. Second Floor wall framing. (SEA 2015)

The original construction drawings state that the floor framing was designed for “210 lbs. per sq. ft. or concentrated load equivalent to 80 H.P size track type tractor.” The structure for the enclosed workshop in the south bay was not observable due to existing finishes.

Roof Level

The roof framing consists of wood trusses with 2x bottom chords and rafters, and 1x diagonal members (Figure S16). No defects were observed in the roof truss framing.



Figure S16. Roof Truss framing. (SEA 2015)

Structural Analysis

Calculations were performed on the second floor framing of HS-11. Currently the usage is parking of vehicles in the north three bays and a workshop in the south bay.

Samples of the existing wood framing was obtained from a joists and a timber girder. Samples were transmitted to Regis Miller a Wood Identification and Information Specialist. The samples submitted were identified as Douglas-fir (*Pseudotsuga menziesii*).

The original construction drawings were reviewed and identify a live load capacity of 210 psf. Historic values for Douglas Fir are identified in the National Lumber Manufacturers Association-Wood Construction Information, September 1st, 1922 were reviewed. Analyzing the timber girder and comparing it to the 1922 values, the stated live load capacity on the drawings is consistent with Douglas Fir Grade #1.

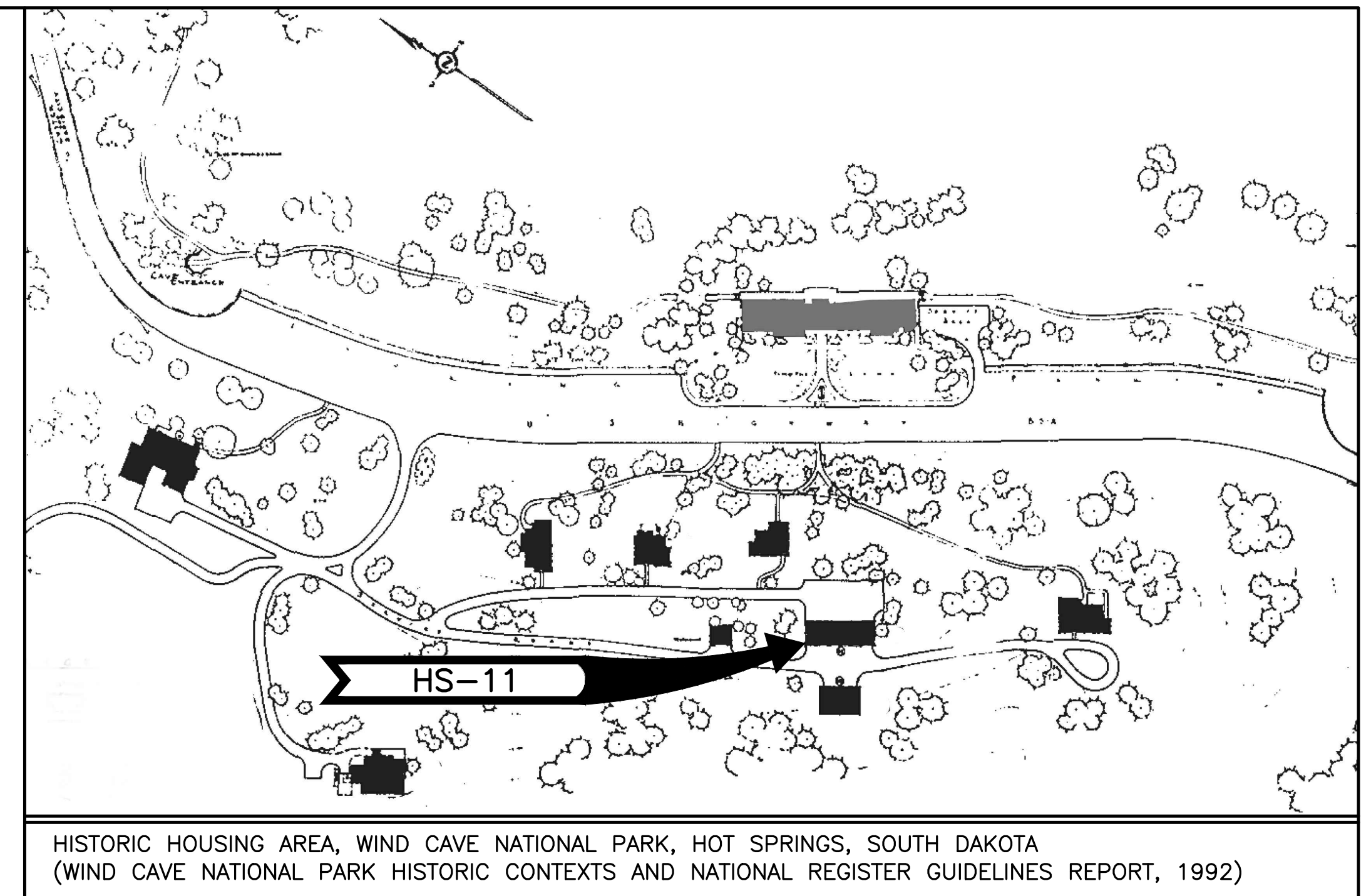
The drawings also called for ¾-inch mastic on the floor. In its current state, there is an asphalt topping over the wood decking. The asphalt topping varies in thickness from approximately one-inch at the west wall to as much as six-inches in thickness at the east wall. Calculations included an additional load of 75 psf for the additional dead load due to the asphalt overlay.

A structural analysis was performed on the existing girders and joists. Current design allowable for Douglas Fir #1 were used and analyzed in accordance with the latest edition of the National Design Specification for Wood Construction. Calculations were performed in accordance with Load Reduction Factor Design (LRFD) methodology. Based on the analysis the floor framing has a calculated live load capacity of 145 psf with the asphalt topping in place, or 195 psf if the asphalt topping is removed. Code required live load capacity for parking garages for passenger vehicles is 40 psf.

The floor framing system has a calculated wheel load capacity of 3,300 pounds with the asphalt in place.

The calculated live load capacities assume the lumber is not deteriorated. As noted previously the joist bearing condition at the west wall is rotten in several locations. Until this condition is repaired or temporarily shored the above live load capacities are not valid.

HS-11 UPPER GARAGE
HISTORIC STRUCTURES REPORT
HISTORIC HOUSING AREA
WIND CAVE NATIONAL PARK
EXISTING CONDITION DRAWINGS
HOT SPRINGS, SOUTH DAKOTA



HS-11 UPPER GARAGE (SRJA 2014)

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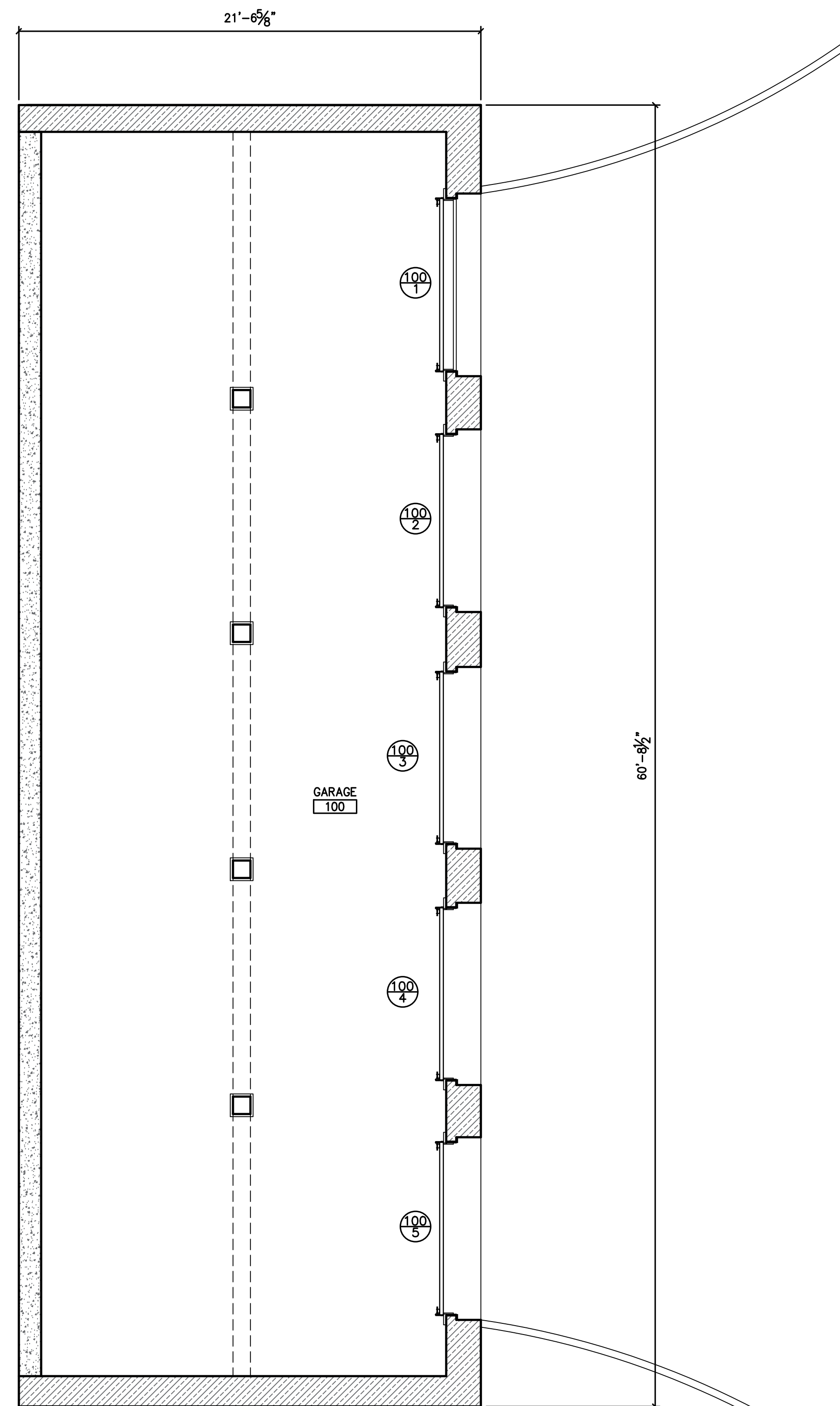
A2 WEST ELEVATION AND NORTH ELEVATION

ELECTRICAL

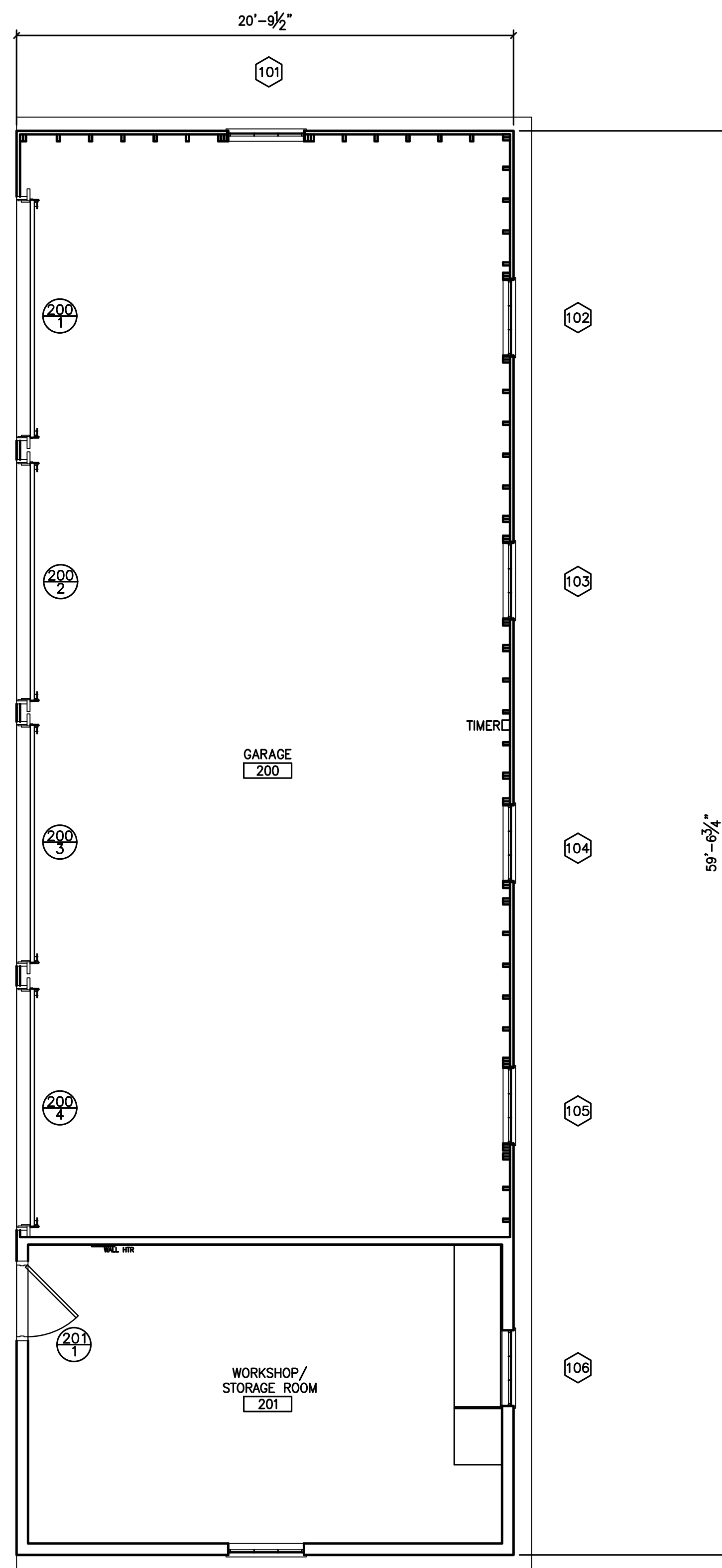
E0 FIRST FLOOR PLAN AND SECOND FLOOR PLAN

MEASURED IN NOVEMBER 2014

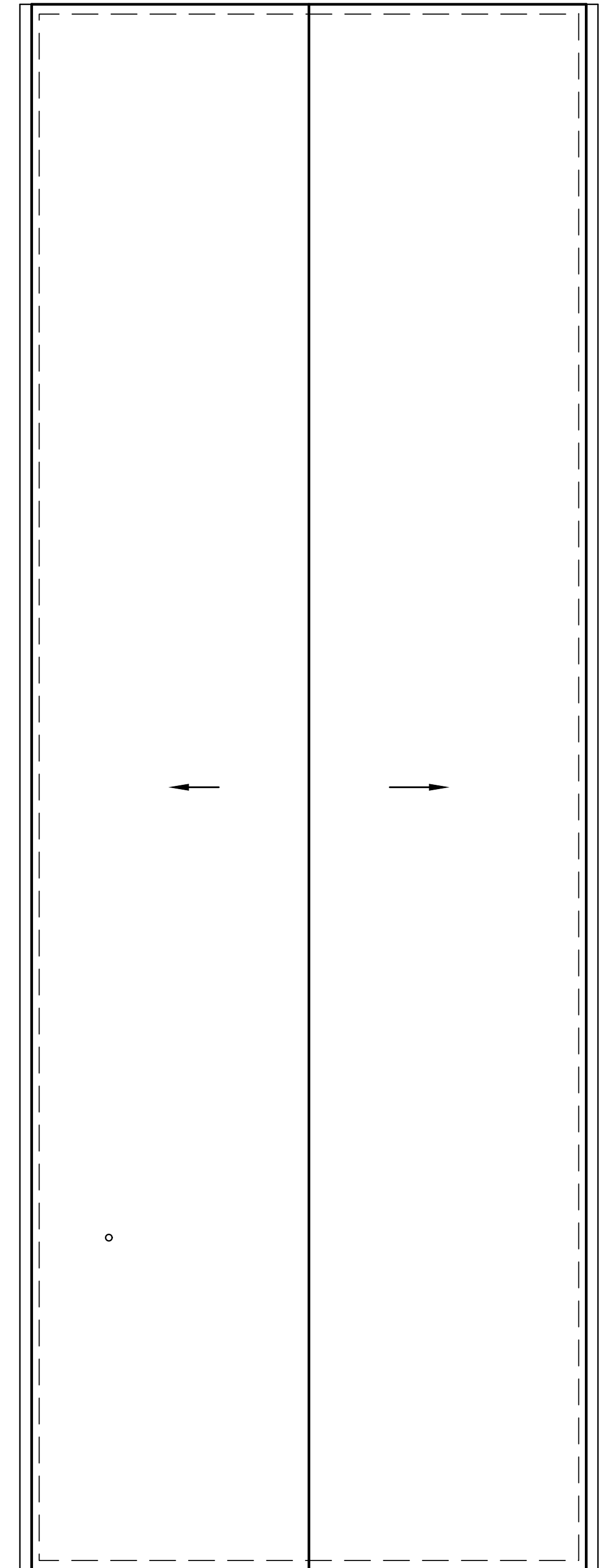
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	UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE DENVER SERVICE CENTER	REGION MIDWEST	PMIS/PKG NO. 158029
			SHEET 1 OF 5



1 EXISTING HS-11 FIRST FLOOR PLAN
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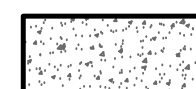


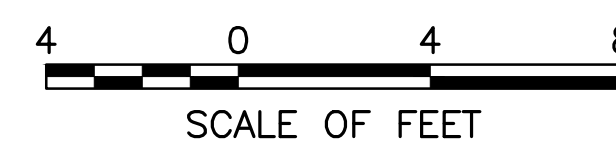
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3 EXISTING HS-11 ROOF PLAN
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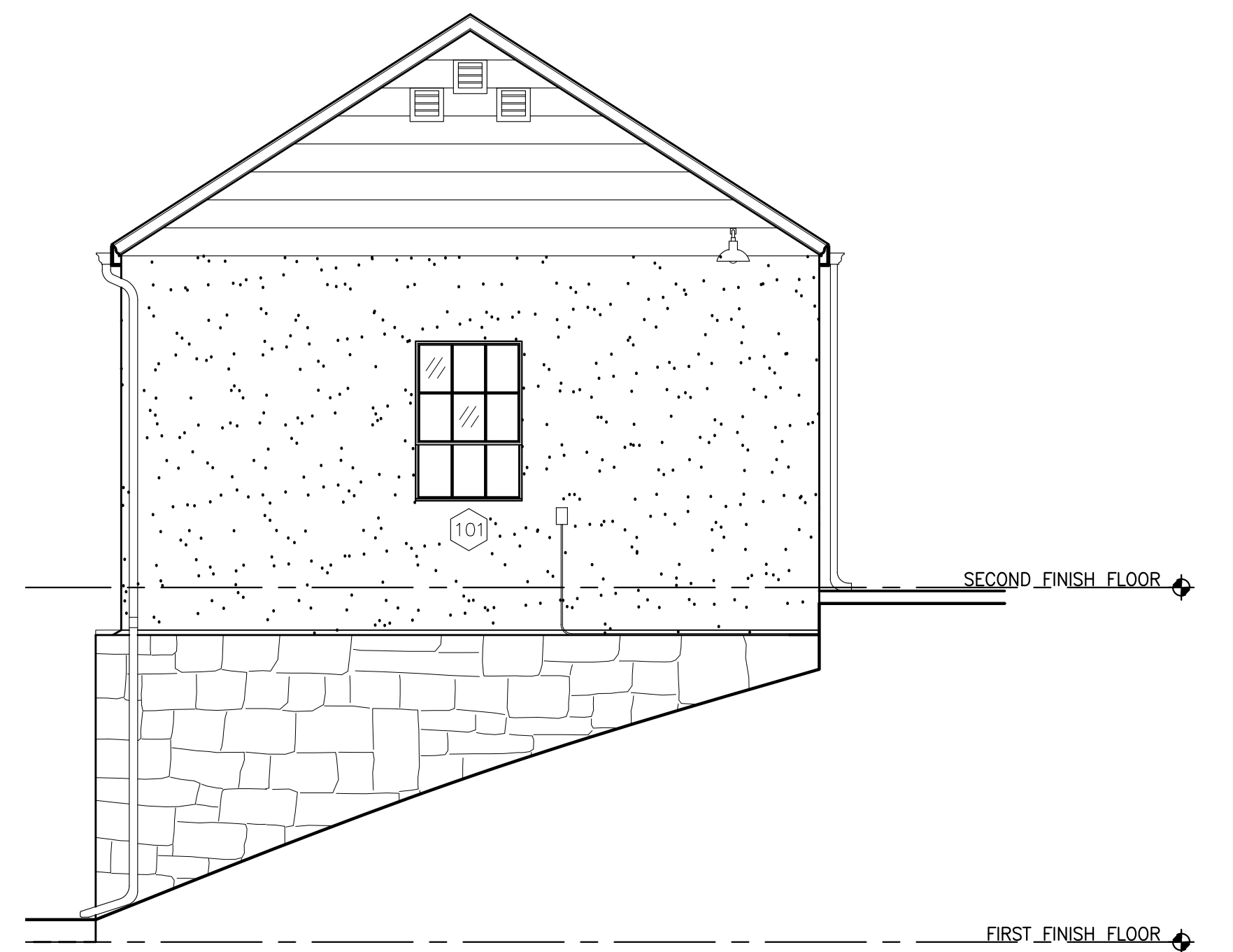
-  MASONRY FOUNDATION WALLS
-  CONCRETE FOUNDATION WALLS



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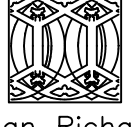


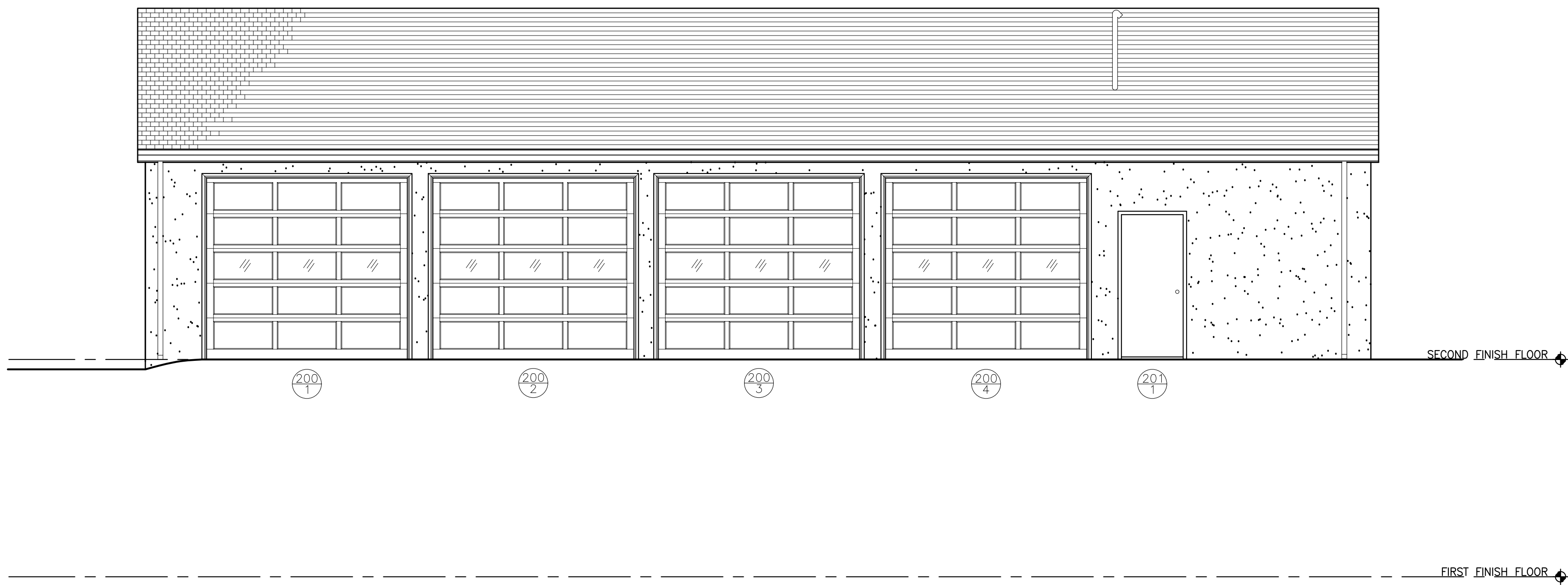
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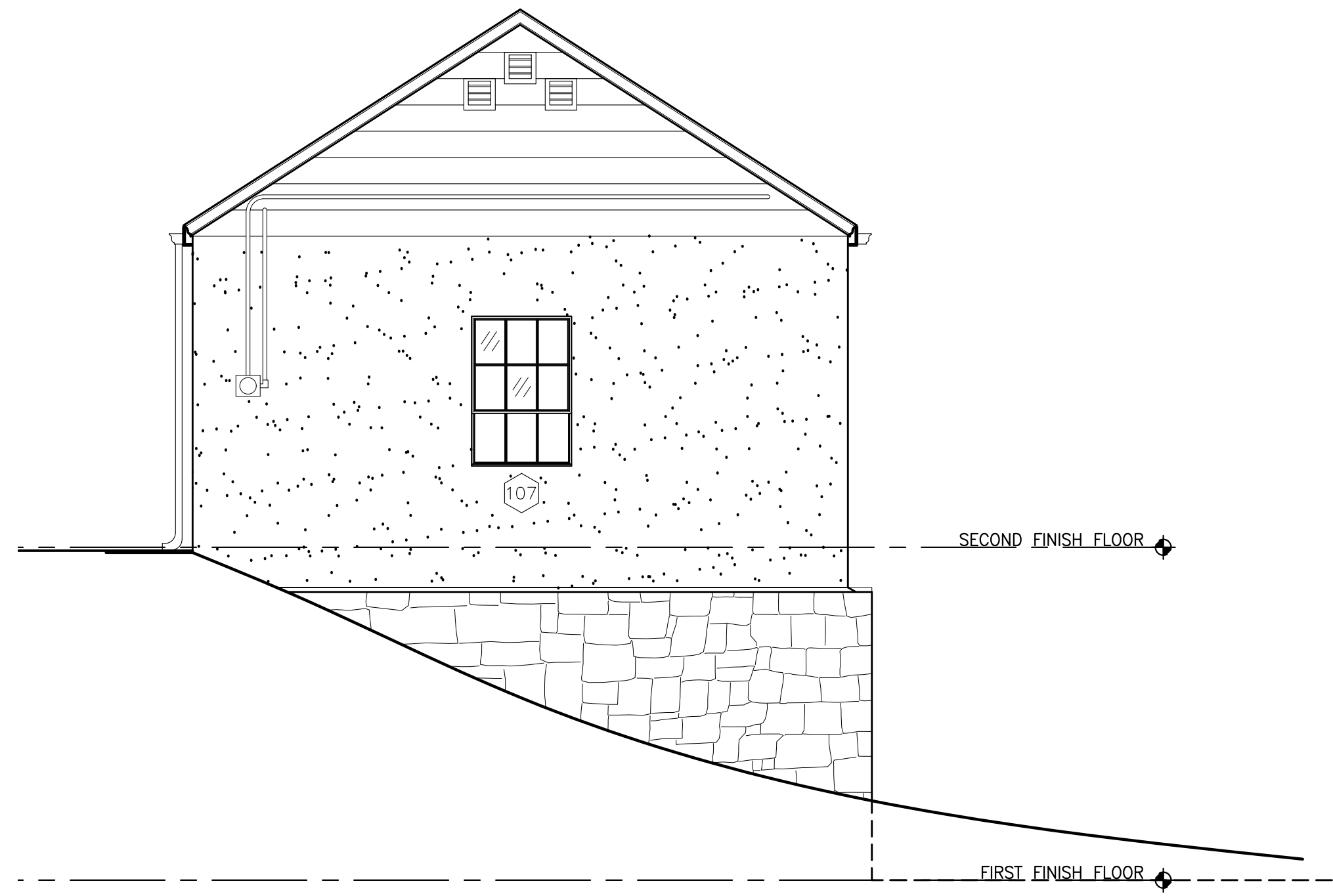
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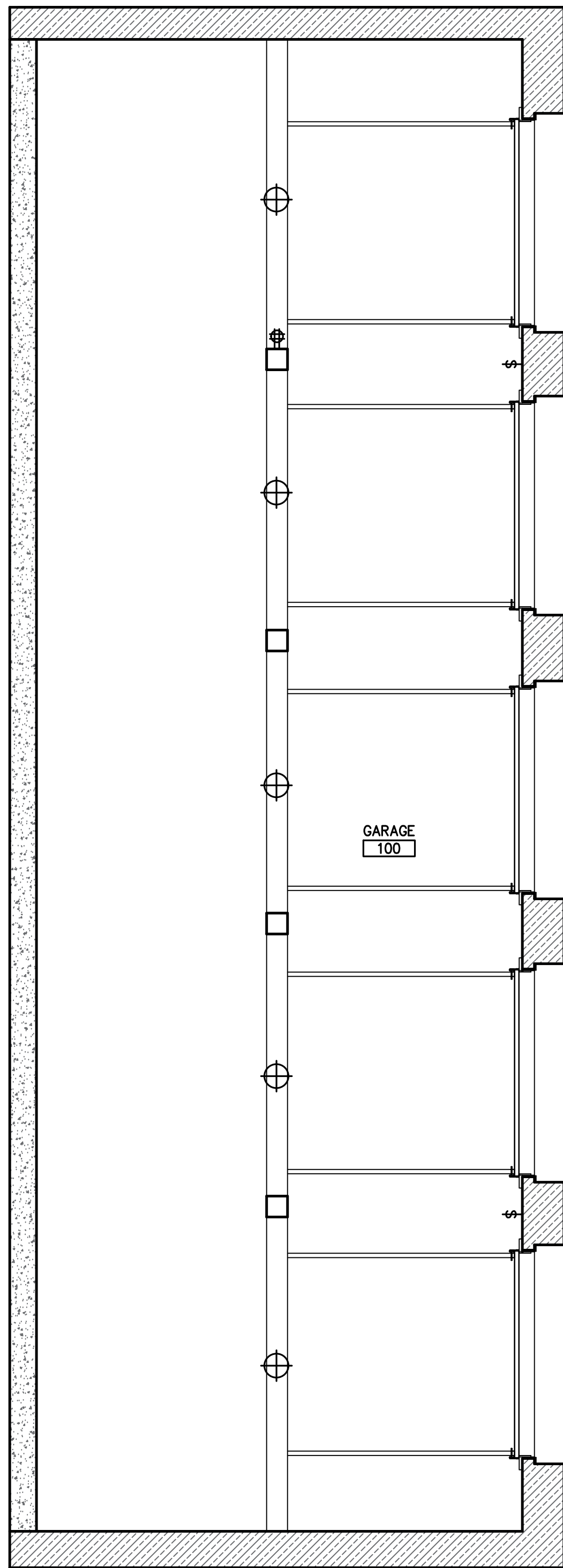
1 EXISTING HS-11 WEST ELEVATION
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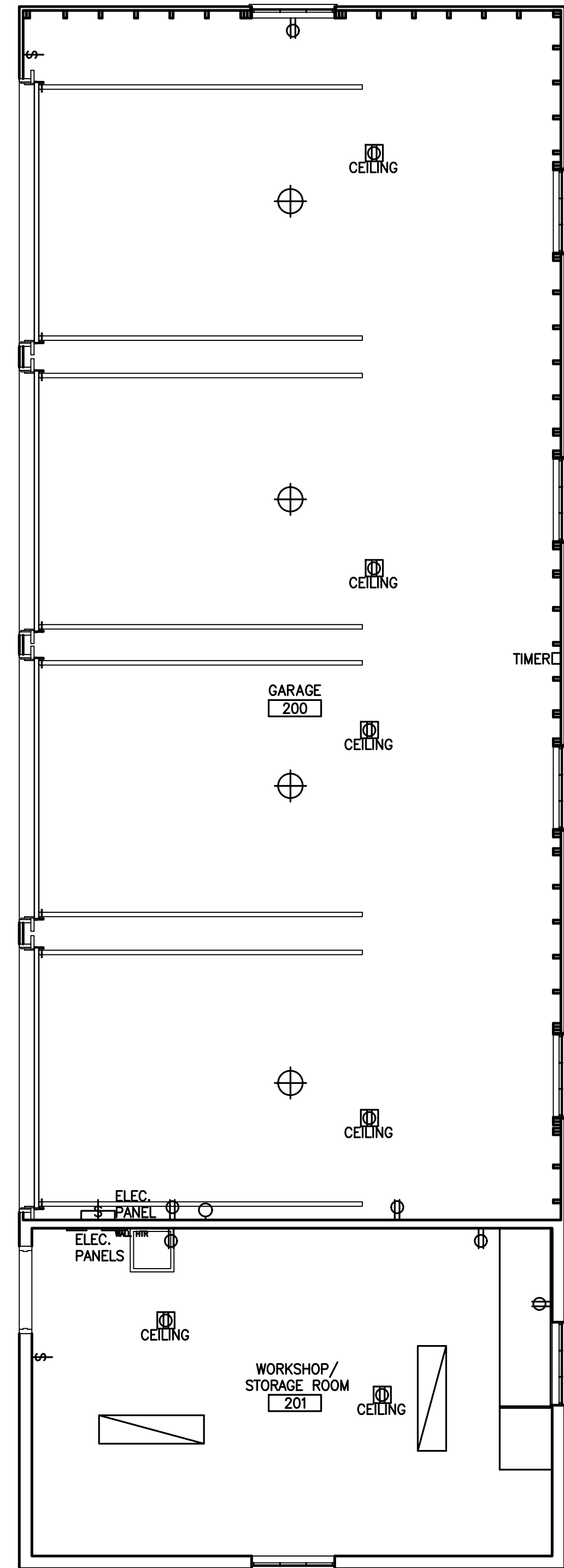
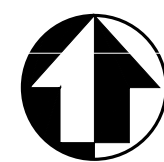
2 EXISTING HS-11 SOUTH ELEVATION
A2 1/4" = 1'-0"



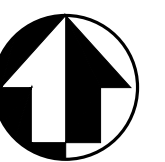
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1 EXISTING HS-11 FIRST FLOOR PLAN
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2 EXISTING HS-11 SECOND FLOOR PLAN
EO 1/4" = 1'-0"



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HS-11. ca. 1934. (WICA Museum Collection #WICA 4119)

Treatment Recommendations

Treatment Recommendations

Introduction

This Historic Structure Report for the HS-11 Upper Garage is intended to serve as the primary document to outline the recommended treatments for the historic building. This section of the report provides treatment recommendations to address the immediate preservation and stabilization of the existing historic fabric, and to establish long term rehabilitation and maintenance needs. The immediate recommendations are to be used as a guide for the preservation of the existing structure, while the long term treatment recommendations are items to consider when future maintenance or rehabilitation work occurs.

The period of significance the Historic Housing Area at Wind Cave National park is established to be from 1928 to 1942. HS-11 was constructed in 1934, near the beginning of the construction for buildings in this newly developed area.

While the existing structure retains a substantial amount of architectural fabric dating to the period of significance, a few important exterior character-defining features are missing. Historical photographs have produced a fairly clear image of the exterior of the garage during the period of significance, including photographs of some of the missing elements. These missing exterior elements include: the wood out-swing doors at the lower level; the bypass wood doors at the upper level; and the wood door with glass at the workshop on the upper level. A light fixture was once installed above the center bay of the lower level garage, but the date of its installation is unknown and may have been installed after the period of significance.

The current use for the Upper Garage is for parking and storage and that use is not anticipated to change in the future. Identifying an appropriate historic treatment approach for the building is important, in order to serve as a guideline for planning and design purposes.

Historic Treatment Approaches

The identification of the possible four following historic treatments is based upon the *Secretary of the Interior's Standards for the Treatment of Historic Properties*:

Preservation: Sustaining the existing form, integrity, and materials of a property.

Restoration: Accurately depicting the form, integrity, and materials of a property as it appeared during a particular period.

Rehabilitation: Compatible use of a property through repair, alterations, and additions while preserving significant historical features.

Reconstruction: Depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape building, structure, or object at a specific period of time and in its historic location.

Selected Historic Treatment Approach - Rehabilitation

Rehabilitation was selected as the treatment approach in order to allow for the retention of historic authenticity while accommodating the installation of modern amenities. HS-11 is experiencing some critical structural deterioration issues at the floor framing of the second parking level. This deterioration is due to water infiltration over an extended period of time and is reflected through the deteriorated floor and framing members and water staining on the interior west foundation wall. Rehabilitation work associated with this critical repair will affect the interior of the first and second levels and will also affect the grading and the asphalt drive to the west of the second level. The interior repairs will be visible along the first floor west wall when completed. Work will need to be coordinated and designed to provide the necessary stabilization and repairs in order to protect the building's historical features.

While rehabilitating the structure, plans should be made to accommodate for these required repairs: structural stabilization of materials, excavation of grade at the west drive and repair of the interior second floor structure (top and bottom sides). Great care should be taken to respect the existing historic fabric of the building, all of which dates to the original 1934 construction.

Construction Impact

All construction activities that may impact the grading or soils surrounding the building must be closely monitored by a National Park Service Archeologist. No demolition, excavation or digging can occur without the required notifications, approvals and documentation. Section 106 compliance is also required for any construction activities that may impact the historic structure and surrounding landscape.

Treatment Recommendations

With the intent of protecting the future integrity of the existing historic fabric and character defining features of the HS-11 Upper Garage, the following treatment recommendations are proposed. These recommendations were developed based on the assessment of the building during the two site visits in fall of 2014 and winter of 2015 and provide direction for immediate issues and long term historic treatment work.

All architectural and structural recommendations are in keeping with the *Secretary of the Interior's Standards for Rehabilitation* as a guide. The goal of any sensitive preservation or rehabilitation project is to retain and preserve the extant original historic materials with the least amount of visible alterations to the structure, while supporting the proposed interpretive use of the building.

Immediate Treatment Recommendations

These immediate recommendations are based on the stabilization and maintenance of the existing structure in its current configuration. A useful reference for small building caretakers is the National Park Service, *Preservation Brief 47: Maintaining the Exteriors of Small and Medium Size Historic Buildings* by Sharon C. Park, FAIA. This brief outlines example maintenance

schedules and checklists, as well as making recommendations for preparation of maintenance and a means for determining qualified contractors who will understand the project objectives for the structure's preservation.

The cost estimate associated with the Immediate and Long Term Treatment Recommendations can be found in Appendix C. No costs were included for electrical, mechanical or plumbing repair or work items at this time.

General Treatment Recommendations

All suspect building surfaces and materials should be tested for lead based paint and asbestos containing materials prior to the initiation of any work. Testing should be done by a qualified hazardous materials consultant.

Immediate Architectural and Structural Treatment Recommendations

Refer to the Treatment Recommendation Drawings.

1. Do not park or store heavy equipment on the second level until shoring or permanent repairs can be made.
2. Repair wall and framing at west wall -
The detail at the bearing condition of the second level floor joists is problematic. As constructed, the top of the concrete foundation wall on the west face slopes into the structure. The water then travels down through the wood decking, saturating the ends of the floor joists and the sill plate. This leads to deterioration of the floor framing.

Many of the floor joists are rotted at the west wall. Additional support is needed. Inspect entire length of the wood sill and replace, in kind with pressure treated wood, as required. A support angle should be installed on the foundation wall to support the floor joists. The angle will be anchored into the foundation wall with stainless steel expansion anchors. The angle should be hot dipped galvanized to minimize corrosion. See SK-1. This will require the temporary or permanent relocation of electrical junction boxes and conduit from the west wall and adjacent floor joists.

In order to minimize future deterioration from water infiltration, the top slope of the foundation wall needs to be changed. As constructed, the top of the wall slopes inward to the structure. The top of the wall should be ground down to slope the top of the wall outward by at least ½-inch. In addition, the grade of the asphalt drive to the west of the building should be lowered to provide a ½-inch lip on the outside face of the foundation wall. The asphalt drive should have a slight swale added before it comes into contact with the building. A soft joint between the asphalt drive and the building should be detailed and provided. Positive drainage should be provided away from the building of one-half-inches per foot. Detail A/TS3 shows a repair detail for supporting the west end of the floor joists.

Consideration could be given to installing a trench drain adjacent to and parallel to the west foundation wall. This could minimize the extent of re-grading the drive west of the building. The top of the concrete foundation wall should still be ground down to provide positive drainage away from the interior of the building and ½-inch lip should still be provided.

3. Repair interior asphalt topping at second level -
 - The asphalt topping on the second floor level needs repair at a few locations. The asphalt should be removed along the west wall in order to make repairs to the wood subfloor. The deteriorated wood decking below the asphalt should be replaced, as required, and new asphalt reinstalled. There is also one location in the northeast corner of the parking bays and a depression in the southwest corner where the asphalt needs repair. As an option, the asphalt could be removed and replaced, or other topping materials could be considered.
4. Limit the size (length) of the vehicles parking on the second level (install curbing)-
 - Do not park vehicles in the second level that are too long and that will result in contact with the east outer wall.
 - Install new curbs or stops to prevent trucks from coming into contact with these walls to prevent vehicles from backing into or coming into contact with the east wall.
5. Inspect the east exterior wall carefully to determine if any repairs are required from vehicles coming into contact with the wall. Stabilize and/or repair the wall, as required.
6. Re-grade at south elevation –
 - Re-grade soil along the southwest corner of the building to a minimum of 4-inches below the top of the stone foundation wall to prevent soil from coming in to contact with the stucco. This will require some civil design retaining wall detailing to support the edge of the driveway.
7. Windows –
 - Test windows for lead based paint and asbestos containing materials in order to prepare for their future restoration.
 - Touch up paint on steel windows until a full rehabilitation can take place.
 - Replace rotted wood sills to match the historic sills (minimum three locations – a closer inspection is required).
 - Replace broken glass in Window 103.
8. Stone foundation restoration -
 - Clean all exposed stone.
 - Spot repoint stone foundation.

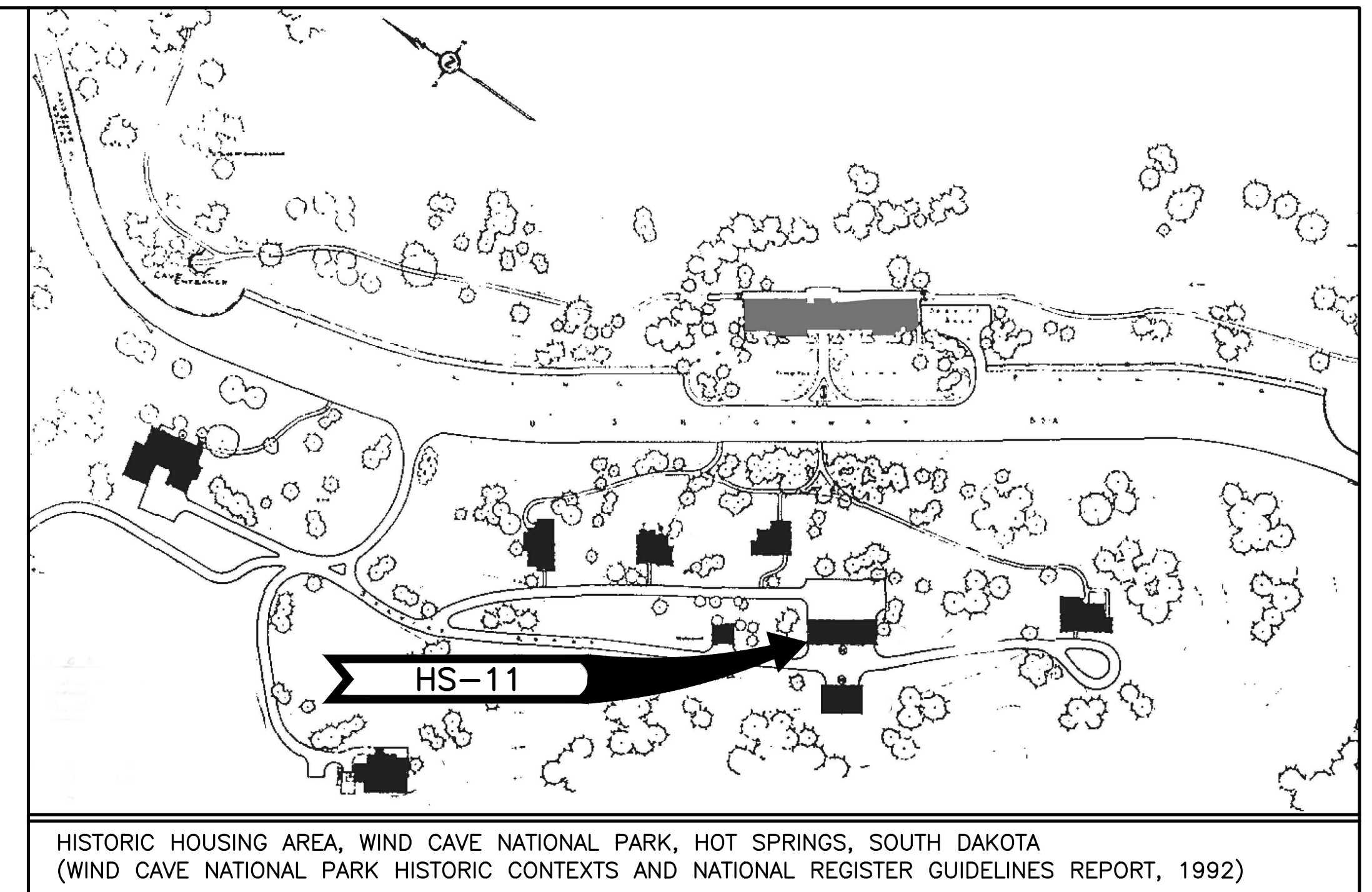
- Repair/replace mortar wash at the top of the foundation wall.
 - Replace fractured foundation stones.
9. West garage doors –
- Spot repair existing west wood overhead doors at areas of deterioration. Paint, as required.
10. Stucco -
- Repair cracks, holes and areas of delamination or where the wire mesh is exposed.
11. Paint/Stain –
- Touch-up paint all trim, including but not limited to cornice, windows, overhangs and door jambs.
 - Paint entire exterior of stucco walls after repairs are completed. New paint color to match historic stucco color, as defined in the Volume I, Historic Building Materials, Stucco section of this report. A Benjamin-Moore paint color match was determined, but must first be sampled, as recommended.
 - Paint floor in Room 201.
12. Sealant –
- Install sealant at perimeter of windows where stucco and steel frames meet.
13. Gutters and Downspouts –
- Extend west roof gutter to the south to pick up the entire length of the roof.
 - Replace both downspouts on the west elevation to extend to drain away from the building.
 - Install a gutter cover for the length of the east elevation to prevent pine needles from clogging this gutters. These gutters are high and not easily visible from the public.
14. Exterior Wood Repair –
- Repair loose soffit on west elevation. This may require removal of bees that appear to be living in this gap.
 - Inspect louver vents in end gables for screening. Replace any damaged or loose screening.

Long Term Architectural and Structural Treatment Recommendations

1. Conduct a comprehensive window survey and provide rehabilitation plan.
2. Restore all seven steel windows.
3. Bury downspout at northeast corner to drain away from the building to grade – not in front of the north bay. This may require trenching across the asphalt driveway so that the water will not pool in front of the stairs and cause a safety hazard.

4. Replace west overhead doors with more historically appropriate doors to match the historic detailing when the existing doors require future replacement.
5. Replace entry door into workshop with historically appropriate door.
6. When it is time to replace the existing roof, consider the installation of the Decra metal roofing shingles to match the Administration Building. The existing 40 year asphalt roof was installed in 2002, so by the time the roof requires replacement, there may be even newer acceptable substitute products that will have the look of a historic wood shingle, with less maintenance and a longer life span.
7. When the roof is replaced, install new reproduction box gutters with rectangular downspouts to match the historic conditions.

HS-11 UPPER GARAGE
HISTORIC STRUCTURES REPORT
HISTORIC HOUSING AREA
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TREATMENT RECOMMENDATION DRAWINGS
HOT SPRINGS, SOUTH DAKOTA



HS-11 UPPER GARAGE (SRJA 2014)

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TA1 EAST ELEVATION AND SOUTH ELEVATION

TA2 WEST ELEVATION AND NORTH ELEVATION

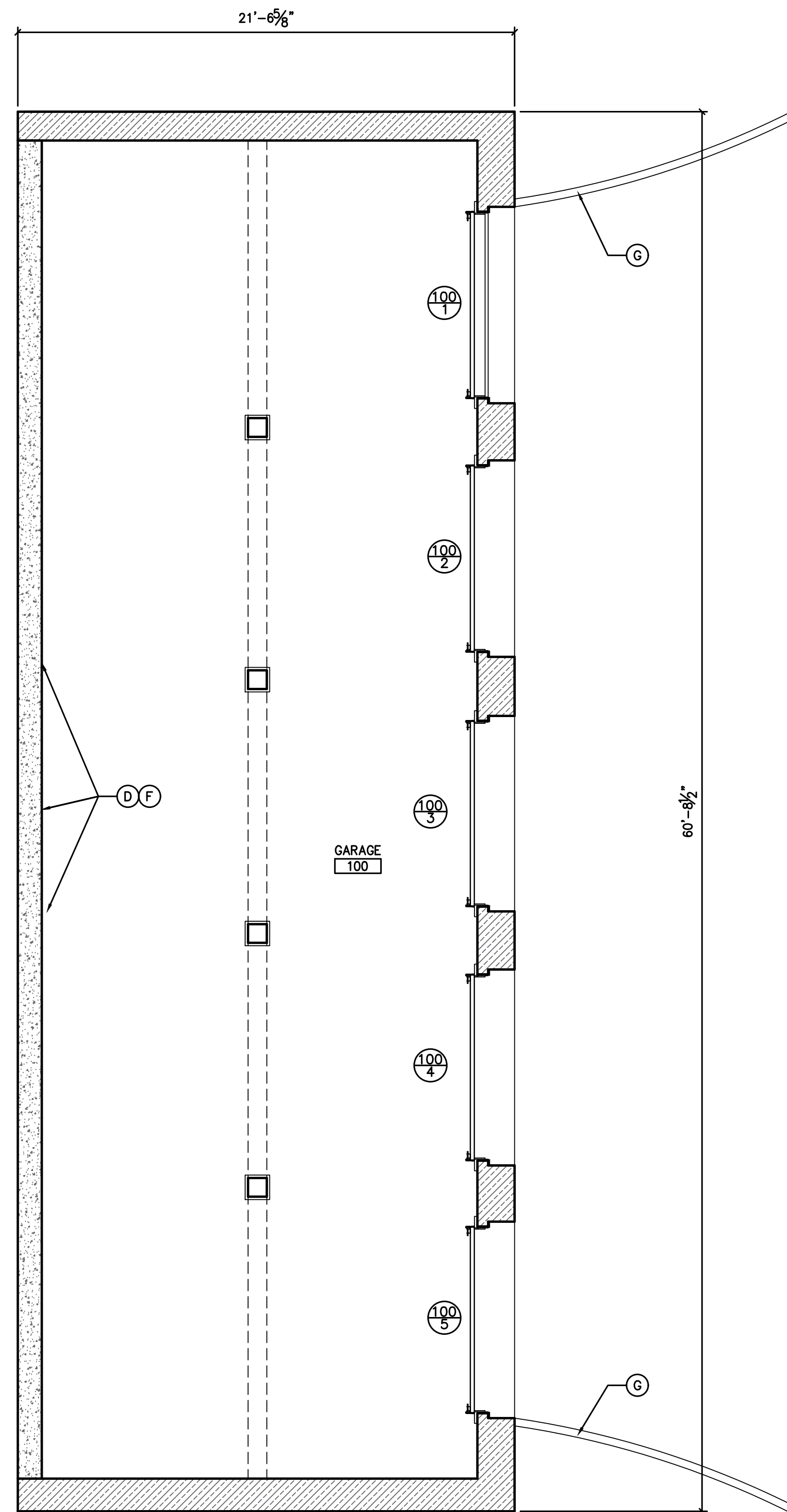
STRUCTURAL

TS0 FIRST FLOOR PLAN FOUNDATION PLAN

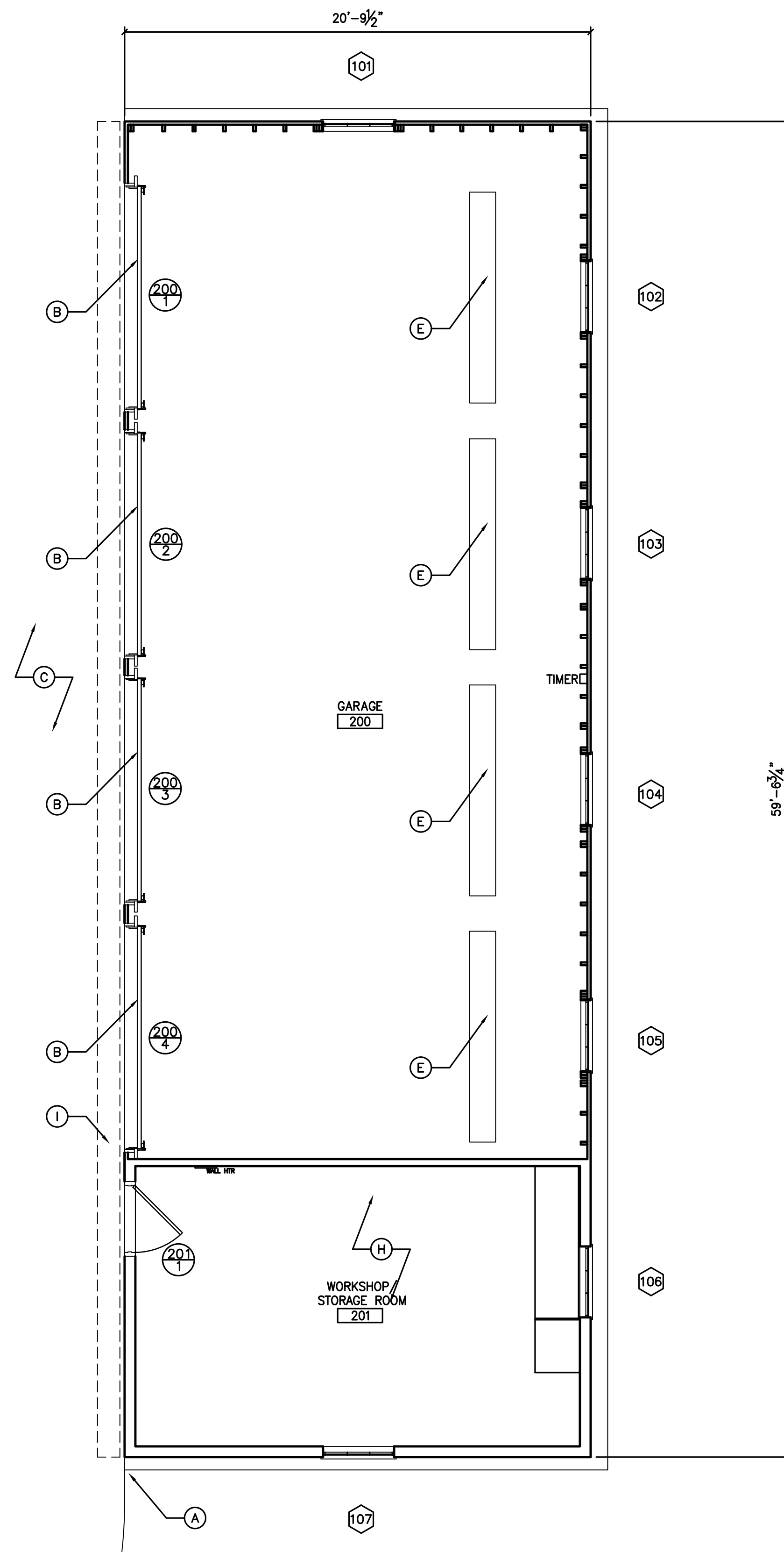
TS1 SECOND FLOOR FRAMING PLAN

TS2 STRUCTURAL DETAILS

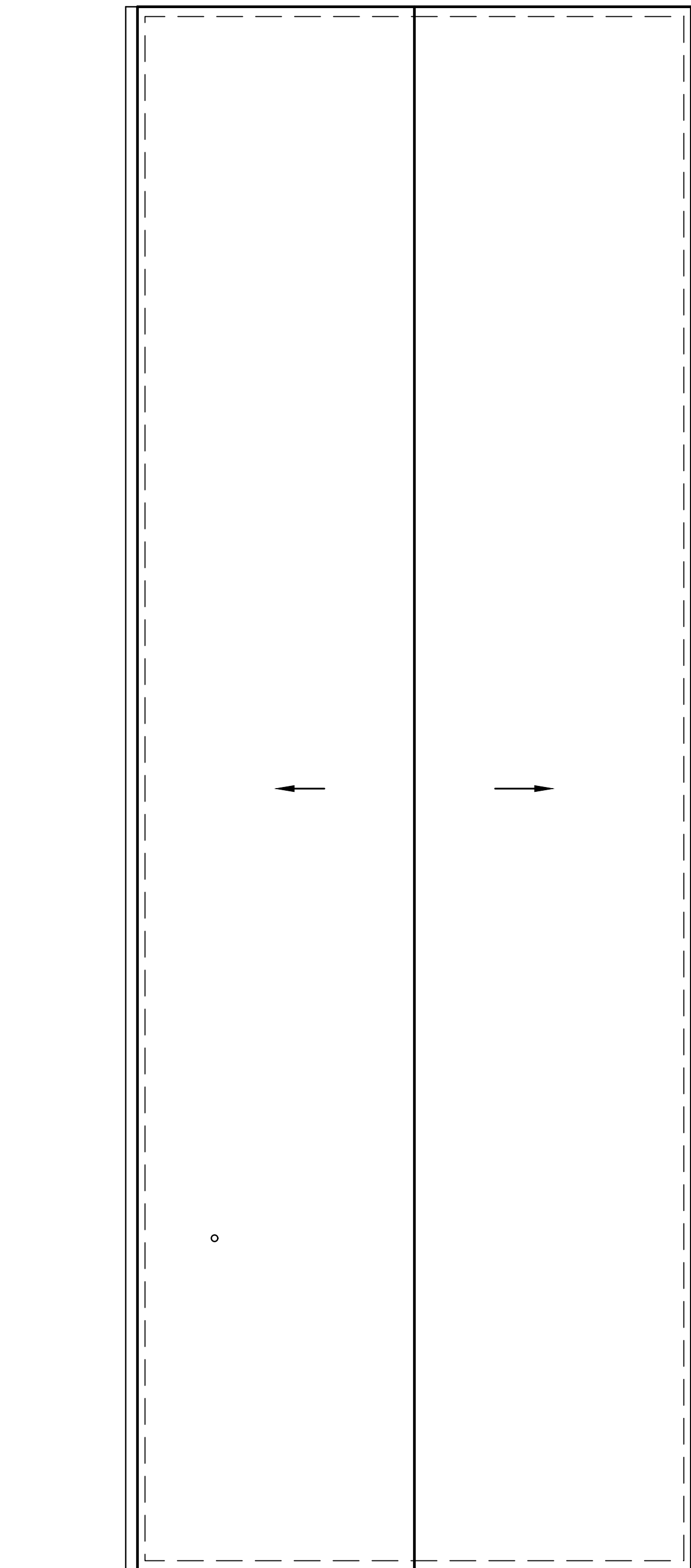
	HISTORIC STRUCTURES REPORT		TITLE OF PROJECT		DRAWING NO.
	UNITED STATES DEPARTMENT OF THE INTERIOR		TREATMENT RECOMMENDATION DRAWINGS		108
			HS-11		128878
			UPPER GARAGE		PMIS/PKG NO.
	NATIONAL PARK SERVICE DENVER SERVICE CENTER		HISTORIC HOUSING AREA		158029
			WIND CAVE NATIONAL PARK		SHEET
REGION MIDWEST			COUNTY CUSTER	STATE SOUTH DAKOTA	1 of 7



1 HS-11 IMMEDIATE AND LONG TERM
TREATMENT DRAWINGS - FIRST FLOOR PLAN
TAO 1/4" = 1'-0"



2 HS-11 IMMEDIATE AND LONG TERM
TREATMENT DRAWINGS - SECOND FLOOR PLAN
TAO 1/4" = 1'-0"



3 HS-11 IMMEDIATE AND LONG TERM
TREATMENT DRAWINGS - ROOF PLAN
TAO 1/4" = 1'-0"

- GENERAL NOTES:**
- PERFORM HAZARDOUS MATERIALS TESTING BEFORE INITIATING ANY WORK.
- KEY NOTES:**
- IMMEDIATE TREATMENT SCOPE OF WORK:**
- LOWER GRADE TO BE 4" BELOW STONE FOUNDATION WALL. INSTALL SHORT RETAINING WALL, AS REQUIRED.
 - REPAIR GARAGE ENTRANCE PER STRUCTURAL DRAWINGS.
 - RE-GRADE ASPHALT DRIVE WITH NEW SWALE, PER STRUCTURAL DRAWINGS. ALTERNATE TREATMENT: INSTALL A CONTINUOUS TRENCH DRAIN TO CAPTURE WATER & DRAIN TO DAYLIGHT AWAY FROM THE STRUCTURE.
 - STABILIZE FIRST FLOOR STRUCTURE PER STRUCTURAL DRAWINGS.
 - INSTALL NEW CURBS, TYPICAL FOUR LOCATIONS.
 - RELOCATE ELECTRICAL CONDUIT AND BOXES AT WEST FOUNDATION WALL FOR STABILIZATION REPAIRS.
 - CLEAN AND REPOINT CURBING.
 - PREP, PRIME AND PAINT INTERIOR WALLS.
 - CONSIDER INSTALLING A TRENCH DRAIN.

- DRAWING KEY:**
- MASONRY FOUNDATION WALLS
 - CONCRETE FOUNDATION WALLS

4 0 4 8
SCALE OF FEET

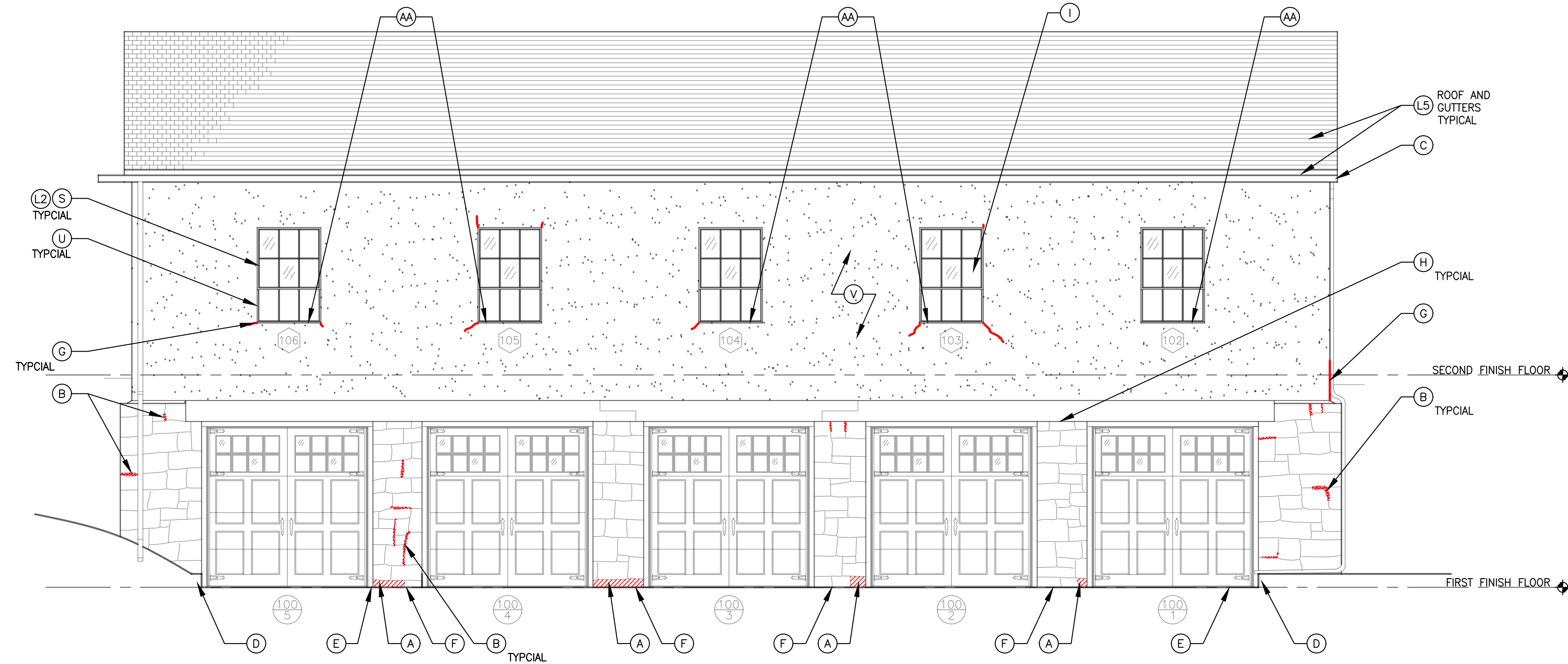
Susan Richards
Johnson &
Associates, Inc.
818 GRAND BLVD.
SUITE 1150
KANSAS CITY, MO
64106
Ph. 816-474-0900
Fax 816-474-0909

DESIGNED:
AG
GADD
AG
TECH. REVIEW:
AG
DATE:
1/27/16

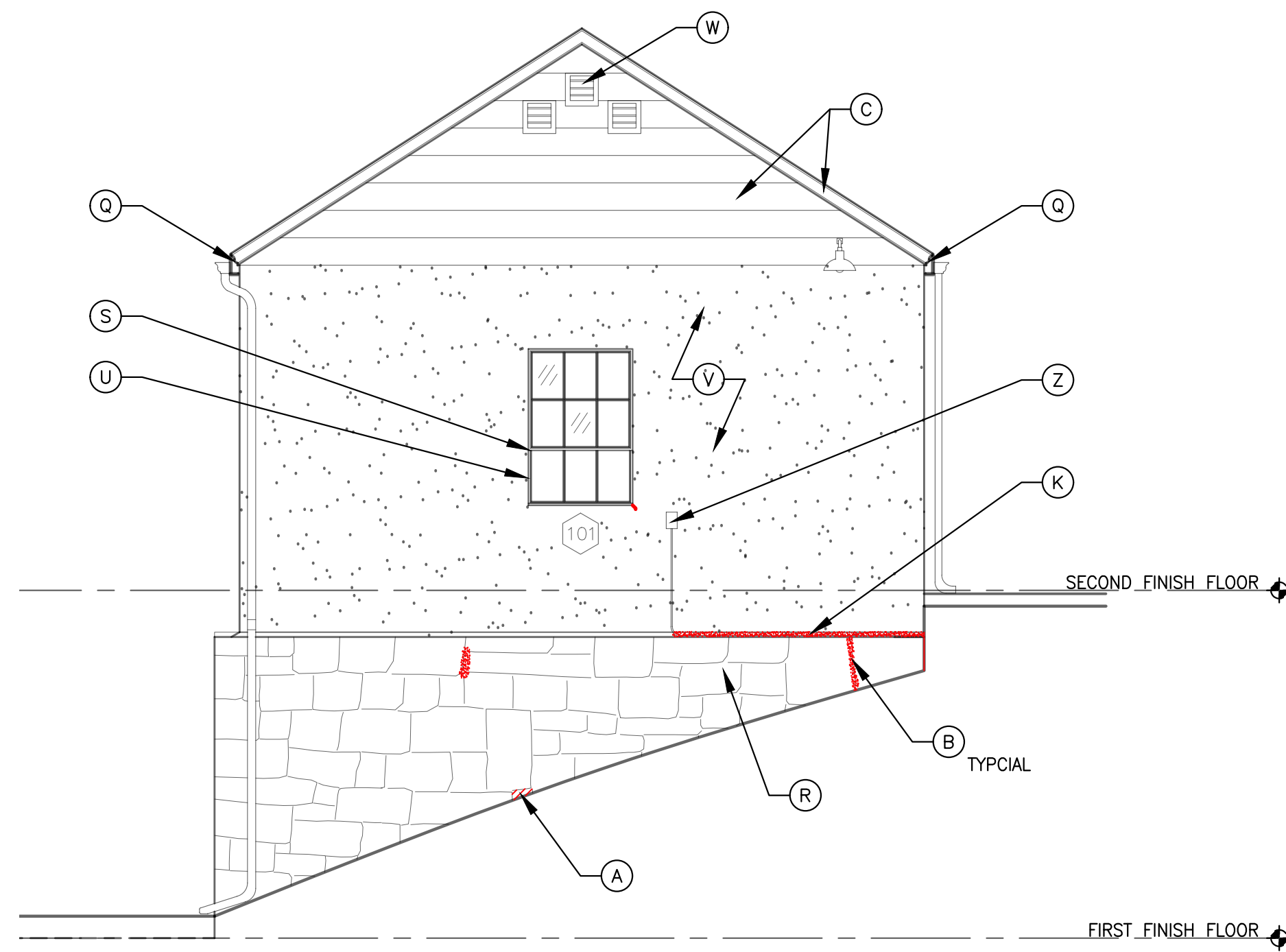
SUB SHEET NO.
TAO

TITLE OF SHEET
TREATMENT RECOMMENDATION DRAWINGS
HS-11
UPPER GARAGE
HISTORIC HOUSING AREA
WIND CAVE NATIONAL PARK
HOT SPRINGS, SOUTH DAKOTA

DRAWING NO.
108
128878
PMIS/PKG NO.
158029
SHEET
2 of 7



1 HS-11 IMMEDIATE AND LONG TERM TREATMENT DRAWINGS — EAST ELEVATION
TA2 1/4" = 1'-0"



2 HS-11 IMMEDIATE AND LONG TERM TREATMENT DRAWINGS — NORTH ELEVATION
TA2 1/4" = 1'-0"



Susan Richards
Johnson &
Associates, Inc.
818 GRAND BLVD.
SUITE 1150
KANSAS CITY, MO
64106
Ph. 816-474-0900
Fax 816-474-0909

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TECH. REVIEW:
AG
DATE:
1/27/16

SUB SHEET NO.
TA1

TITLE OF SHEET
TREATMENT RECOMMENDATION DRAWINGS
HS-11
UPPER GARAGE
HISTORIC HOUSING AREA
WIND CAVE NATIONAL PARK
HOT SPRINGS, SOUTH DAKOTA

DRAWING NO.
108
128878
PMIS/PKG NO.
158029
SHEET
3 OF 7

GENERAL NOTES:

1. SPOT REPOINT AS REQUIRED. NEW MORTAR SHOULD MATCH EXISTING IN COMPOSITION, COLOR, TEXTURE AND PROFILE.
2. CLEAN ALL STONE TO REMOVE DIRT AND BIOLOGICAL GROWTH.
3. PATCH AND REPAIR ALL HOLES IN THE STUCCO.

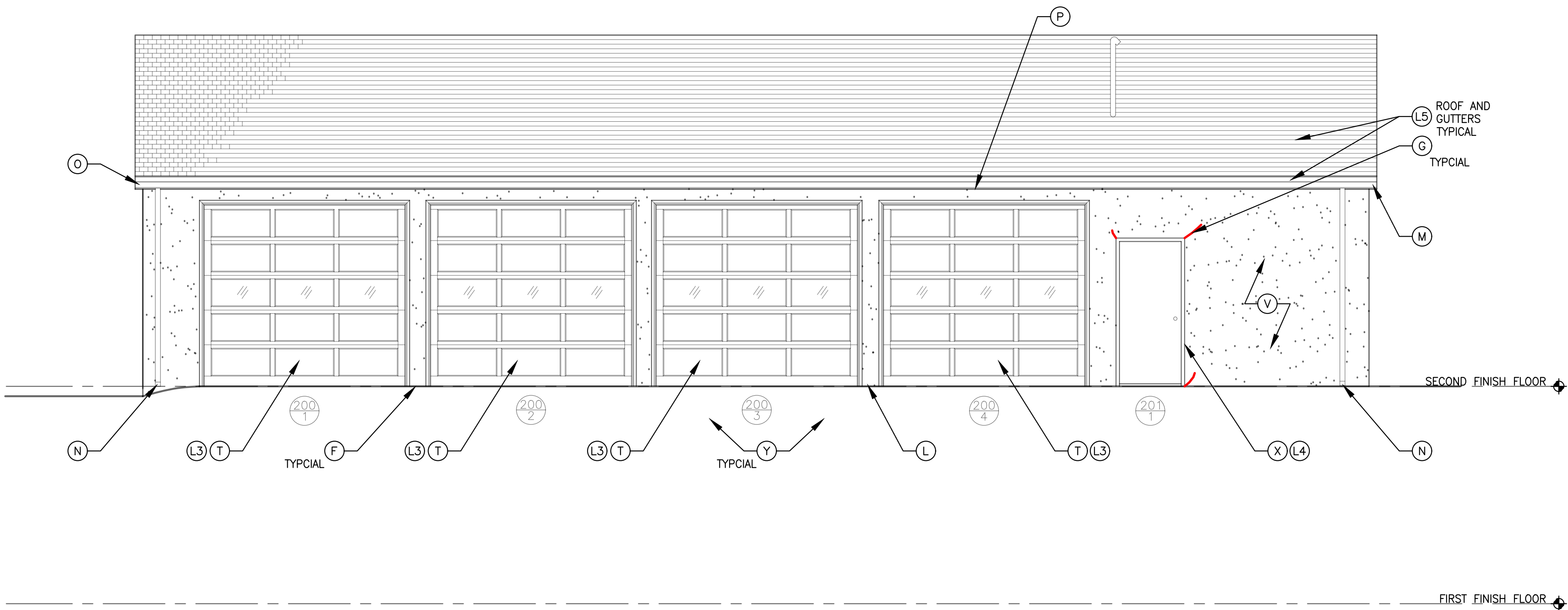
KEY NOTES:

IMMEDIATE TREATMENT SCOPE OF WORK:

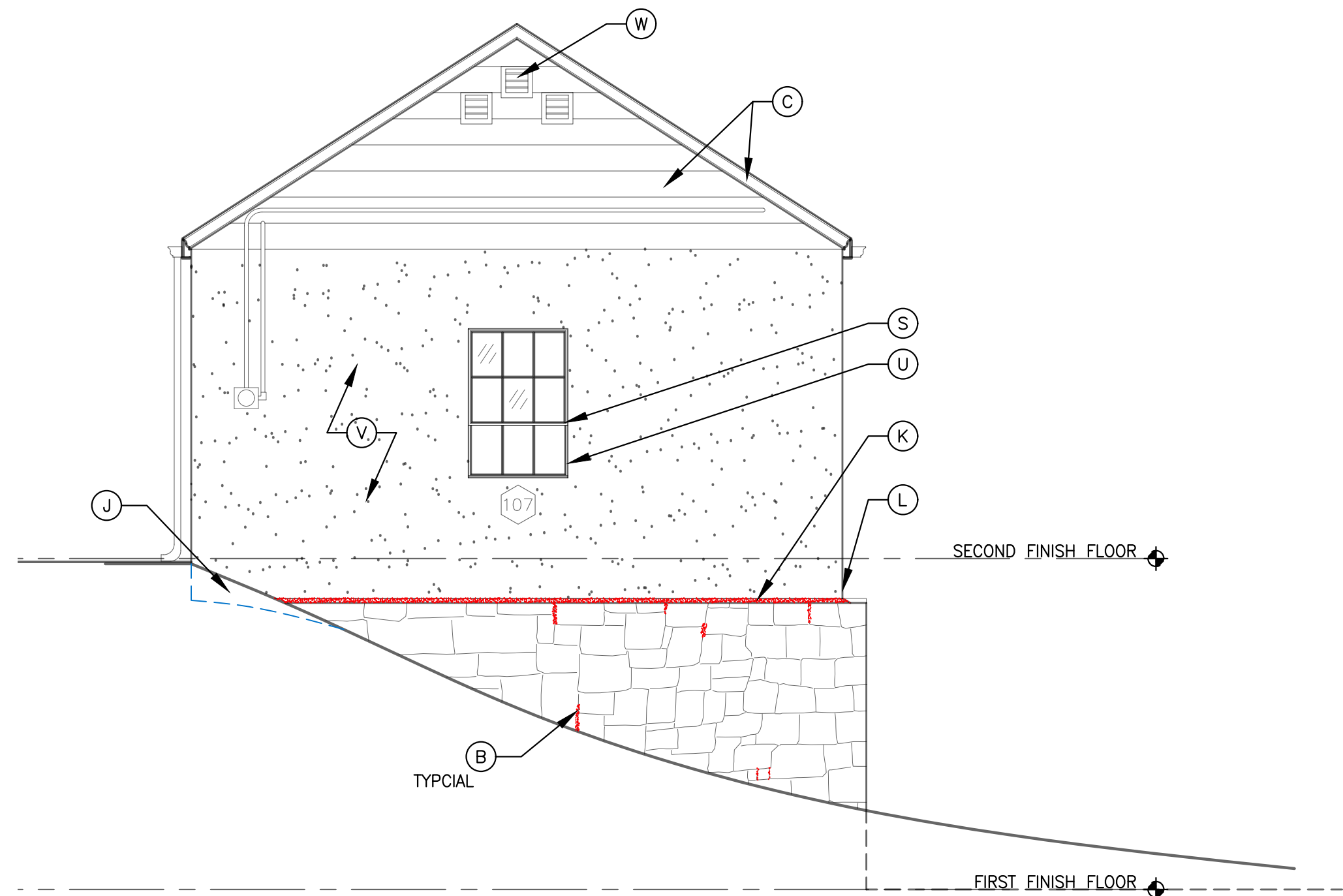
- A. CAREFULLY REMOVE EXISTING DETERIORATED STONE AND REPLACE IN-KIND.
- B. REPOINT EXISTING MORTAR JOINTS.
- C. PREP, PRIME AND PAINT.
- D. CLEAN AND REPOINT STONE CURBING
- E. PATCH AND REPAIR CRACKED CONCRETE SILL.
- F. INSTALL SOFT JOINT BETWEEN THE ASPHALT PAVING AND THE BUILDING AFTER GRADING.
- G. PATCH AND REPAIR CRACK IN STUCCO.
- H. REPLACE WASH ON TOP, TYPICAL ALL PIERS.
- I. REPLACE BROKEN PANE OF GLASS IN-KIND.
- J. LOWER GRADE TO BE 4" BELOW STONE FOUNDATION WALL. INSTALL SHORT RETAINING WALL, AS REQUIRED.
- K. INSTALL NEW WASH.
- L. APPLY STUCCO OVER EXPOSED WIRE LATH. PREP, PRIME AND PAINT.
- M. EXTEND GUTTER TO THE EDGE OF THE ROOF.
- N. INSTALL NEW DOWNSPOUT EXTENSION AND RUN DOWNSPOUT AROUND THE CORNER. DIRECT DOWNSPOUT DOWN THE HILL, AWAY FROM BUILDING.
- O. REPAIR DAMAGED GUTTER.
- P. REPLACE DETERIORATED SOFFIT BOARD.
- Q. REPAIR HOLE IN WOOD TRIM.
- R. CLEAN PAINT FROM STONE.
- S. PREP, PRIME AND PAINT ALL WINDOWS (TEMPORARY UNTIL LARGER RESTORATION PROJECT CAN OCCUR).
- T. REPAIR DOORS AS REQUIRED.
- U. INSTALL SEALANT AT PERIMETER OF WINDOWS WHERE STUCCO AND STEEL FRAMES MEET.
- V. PREP, PRIME AND PAINT STUCCO AFTER REPAIRS.
- W. CONFIRM SCREENING IN LOUVERS IS IN GOOD CONDITION. REPLACE, AS REQUIRED.
- X. TOUCH-UP PAINT.
- Y. REFER TO STRUCTURAL DRAWINGS FOR REQUIRED RE-GRADING AND REPAIR WORK AT GARAGE ENTRANCES.
- Z. PATCH HOLES IN STUCCO.
- AA. EPOXY REPAIR WOOD WINDOW SILL.

LONG TERM TREATMENT SCOPE OF WORK:

- GENERAL SCOPE
1. CONDUCT A COMPREHENSIVE WINDOW SURVEY AND PROVIDE A REHABILITATION PLAN.
 2. RESTORE ALL (7) SEVEN STEEL WINDOWS.
 3. REPLACE WEST OVERHEAD DOORS WITH MORE HISTORICALLY APPROPRIATE DOORS TO MATCH THE HISTORIC DETAILING.
 4. REPLACE EXTERIOR DOOR INTO WORKSHOP WITH HISTORICALLY APPROPRIATE DOOR 201/1.
 5. WHEN THE EXISTING ROOF IS READY FOR REPLACEMENT, CONSIDER THE DECRA METAL REPLACEMENT ROOFING SYSTEM OR ONE OF THE OTHER RECOMMENDED REPLACEMENT ROOFS DISCUSSED IN THE TREATMENT RECOMMENDATIONS. REPLACE GUTTERS AND DOWNSPOUTS TO MATCH THE HISTORIC BOX GUTTERS.



1 HS-11 IMMEDIATE AND LONG TERM TREATMENT DRAWINGS - WEST ELEVATION
TA3 1/4" = 1'-0"



2 HS-11 IMMEDIATE AND LONG TERM TREATMENT DRAWINGS - SOUTH ELEVATION
TA3 1/4" = 1'-0"



Susan Richards
Johnson &
Associates, Inc.
818 GRAND BLVD.
SUITE 1150
KANSAS CITY, MO
64106
Ph. 816-474-0900
Fax 816-474-0909

DESIGNED:
AG
TECH. REVIEW:
AG
DATE:
1/27/16

SUB SHEET NO.

TA2

TITLE OF SHEET
TREATMENT RECOMMENDATION DRAWINGS
HS-11
UPPER GARAGE
HISTORIC HOUSING AREA
WIND CAVE NATIONAL PARK
HOT SPRINGS, SOUTH DAKOTA

DRAWING NO.
108
128878
PMIS/PKG NO.
158029
SHEET
4 OF 7

GENERAL NOTES:

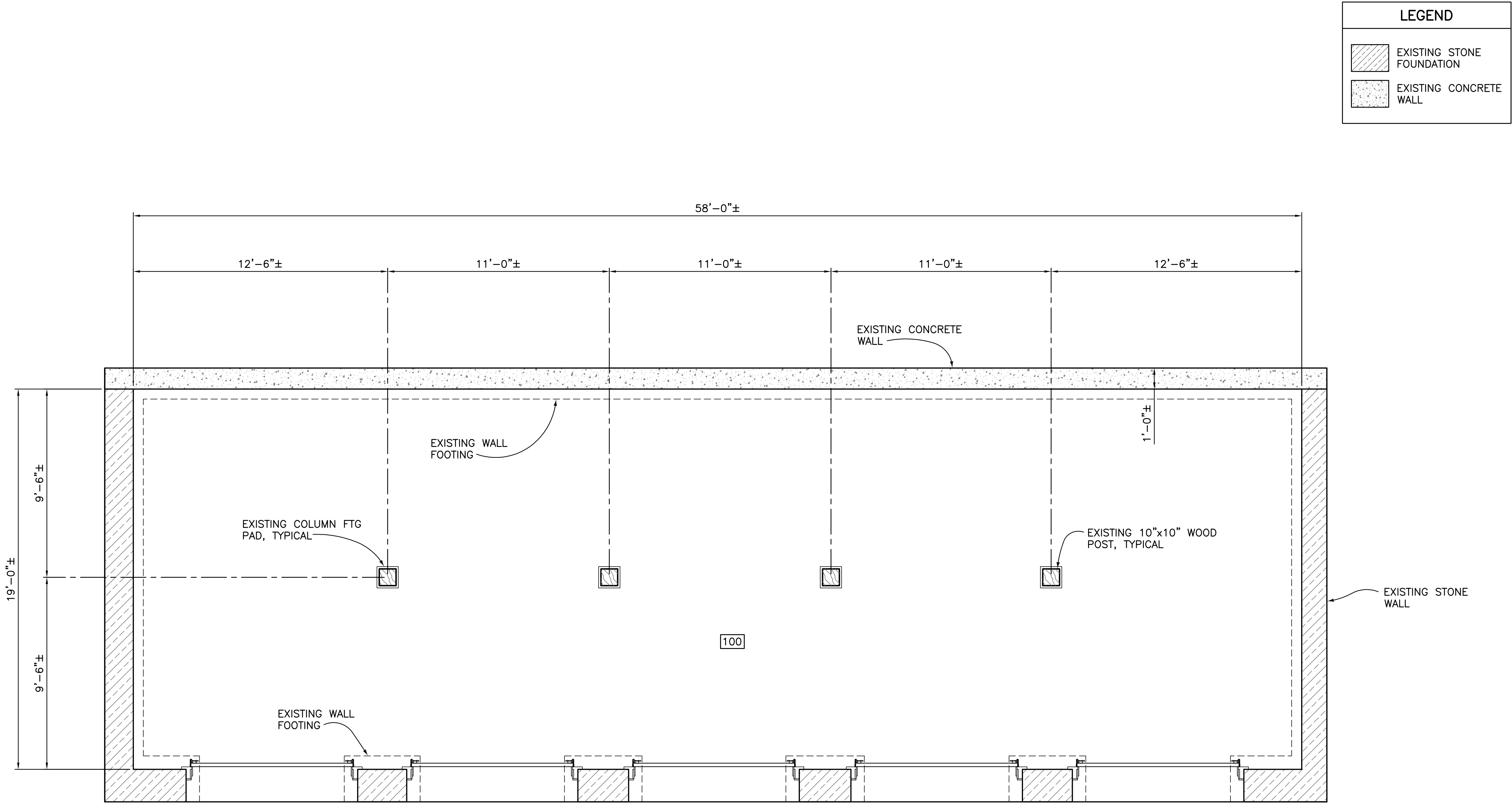
1. SPOT REPOINT AS REQUIRED. NEW MORTAR SHOULD MATCH EXISTING IN COMPOSITION, COLOR, TEXTURE AND PROFILE.
2. CLEAN ALL STONE TO REMOVE DIRT AND BIOLOGICAL GROWTH.
3. PATCH AND REPAIR ALL HOLES IN THE STUCCO.

KEY NOTES:

- IMMEDIATE TREATMENT SCOPE OF WORK:**
- A. CAREFULLY REMOVE EXISTING DETERIORATED STONE AND REPLACE IN-KIND.
 - B. REPOINT EXISTING MORTAR JOINTS.
 - C. PREP, PRIME AND PAINT.
 - D. CLEAN AND REPOINT STONE CURBING
 - E. PATCH AND REPAIR CRACKED CONCRETE SILL.
 - F. INSTALL SOFT JOINT BETWEEN THE ASPHALT PAVING AND THE BUILDING AFTER GRADING.
 - G. PATCH AND REPAIR CRACK IN STUCCO.
 - H. REPLACE WASH ON TOP, TYPICAL ALL PIERS.
 - I. REPLACE BROKEN PANE OF GLASS IN-KIND.
 - J. LOWER GRADE TO BE 4" BELOW STONE FOUNDATION WALL. INSTALL SHORT RETAINING WALL, AS REQUIRED.
 - K. INSTALL NEW WASH.
 - L. APPLY STUCCO OVER EXPOSED WIRE LATH. PREP, PRIME AND PAINT.
 - M. EXTEND GUTTER TO THE EDGE OF THE ROOF.
 - N. INSTALL NEW DOWNSPOUT EXTENSION AND RUN DOWNSPOUT AROUND THE CORNER. DIRECT DOWNSPOUT DOWN THE HILL, AWAY FROM BUILDING.
 - O. REPAIR DAMAGED GUTTER.
 - P. REPLACE DETERIORATED SOFFIT BOARD.
 - Q. REPAIR HOLE IN WOOD TRIM.
 - R. CLEAN PAINT FROM STONE.
 - S. PREP, PRIME AND PAINT ALL WINDOWS (TEMPORARY UNTIL LARGER RESTORATION PROJECT CAN OCCUR).
 - T. REPAIR DOORS AS REQUIRED.
 - U. INSTALL SEALANT AT PERIMETER OF WINDOWS WHERE STUCCO AND STEEL FRAMES MEET.
 - V. PREP, PRIME AND PAINT STUCCO AFTER REPAIRS.
 - W. CONFIRM SCREENING IN LOUVERS IS IN GOOD CONDITION. REPLACE, AS REQUIRED.
 - X. TOUCH-UP PAINT.
 - Y. REFER TO STRUCTURAL DRAWINGS FOR REQUIRED RE-GRADING AND REPAIR WORK AT GARAGE ENTRANCES.
 - Z. PATCH HOLES IN STUCCO.
 - AA. EPOXY REPAIR WOOD WINDOW SILL.

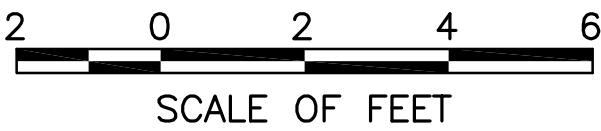
- LONG TERM TREATMENT SCOPE OF WORK:**
- GENERAL SCOPE**
1. CONDUCT A COMPREHENSIVE WINDOW SURVEY AND PROVIDE A REHABILITATION PLAN.
 2. RESTORE ALL (7) SEVEN STEEL WINDOWS.
 3. REPLACE WEST OVERHEAD DOORS WITH MORE HISTORICALLY APPROPRIATE DOORS TO MATCH THE HISTORIC DETAILING.
 4. REPLACE EXTERIOR DOOR INTO WORKSHOP WITH HISTORICALLY APPROPRIATE DOOR 201/1.
 5. WHEN THE EXISTING ROOF IS READY FOR REPLACEMENT, CONSIDER THE DECRA METAL REPLACEMENT ROOFING SYSTEM OR ONE OF THE OTHER RECOMMENDED REPLACEMENT ROOFS DISCUSSED IN THE TREATMENT RECOMMENDATIONS. REPLACE GUTTERS AND DOWNSPOUTS TO MATCH THE HISTORIC BOX GUTTERS.

3/30/15 08:52 LFRISBE R19 C:\2014\147\DRAWINGS\02 TREATMENT DRAWINGS\XX- WIND CAVE- SECOND SH.DWG



1
TSO

FIRST FLOOR FOUNDATION PLAN
3/8"=1'-0"



**STRUCTURAL
ENGINEERING
ASSOCIATES, INC.**
1000 WALNUT
SUITE 1570 KANSAS
CITY, MO 64106
Ph. 816-421-1042
Fax 816-421-1061

DESIGNED:
RCJ
LEF
TECH. REVIEW:
DATE:
1/27/16

SUB SHEET NO.
TSO

TITLE OF SHEET
TREATMENT RECOMMENDATION DRAWINGS
HS-11
UPPER GARAGE
HISTORIC HOUSING AREA
WIND CAVE NATIONAL PARK
HOT SPRINGS, SOUTH DAKOTA

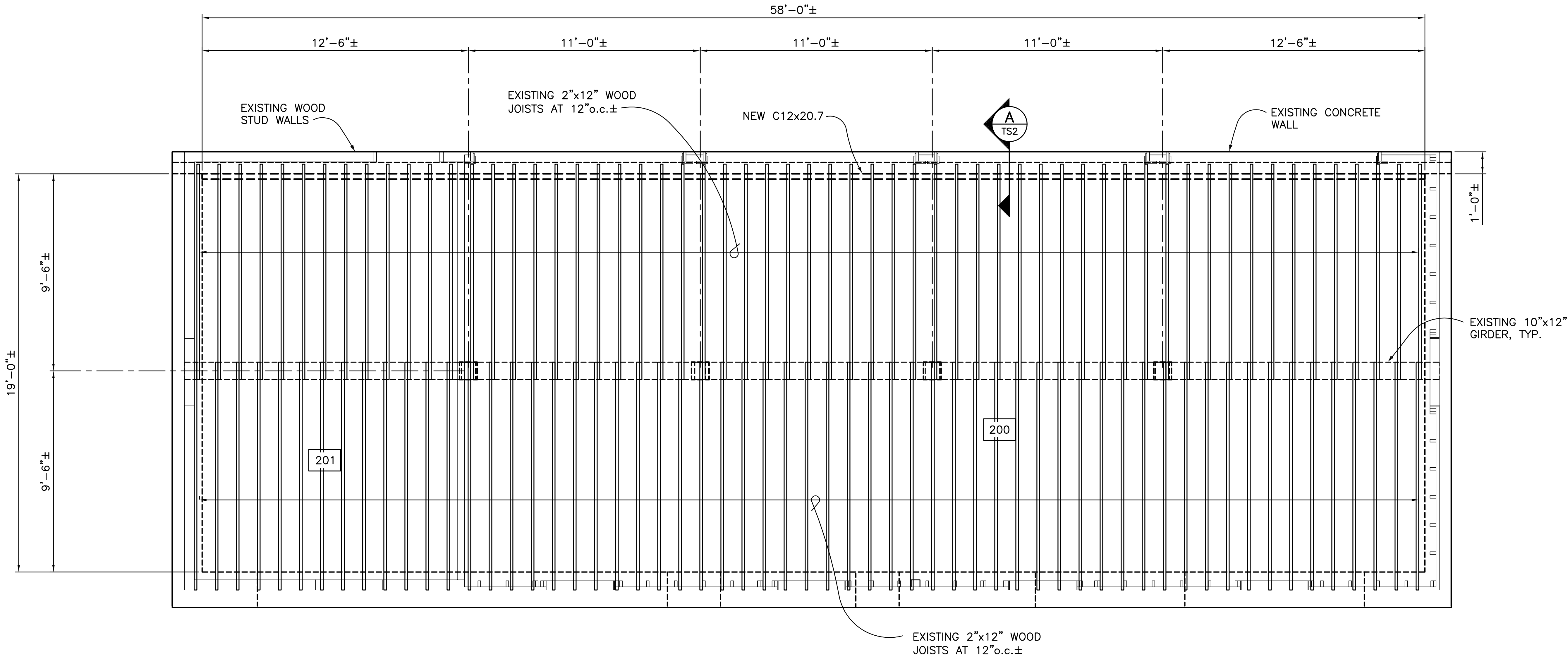
DRAWING NO.
108
128878
PMIS/PKG NO.
158029
SHEET
5 OF **7**

3/30/15 08:52 LFRISBE R19 C:\2014\147\DRAWINGS\02 TREATMENT DRAWINGS\XX- WIND CAVE- SECOND SH.DWG

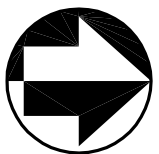
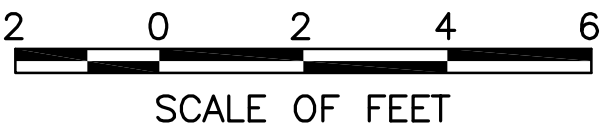
LEGEND

EXISTING STONE FOUNDATION

EXISTING CONCRETE WALL



1 SECOND FLOOR FRAMING PLAN
TS1 3/8"=1'-0"



STRUCTURAL
ENGINEERING
ASSOCIATES, INC.

1000 WALNUT
SUITE 1570 KANSAS
CITY, MO 64106
Ph. 816-421-1042
Fax 816-421-1061

DESIGNED:
RCJ
GADD
LEF

TECH. REVIEW:

DATE:
1/27/16

SUB SHEET NO.

TS1

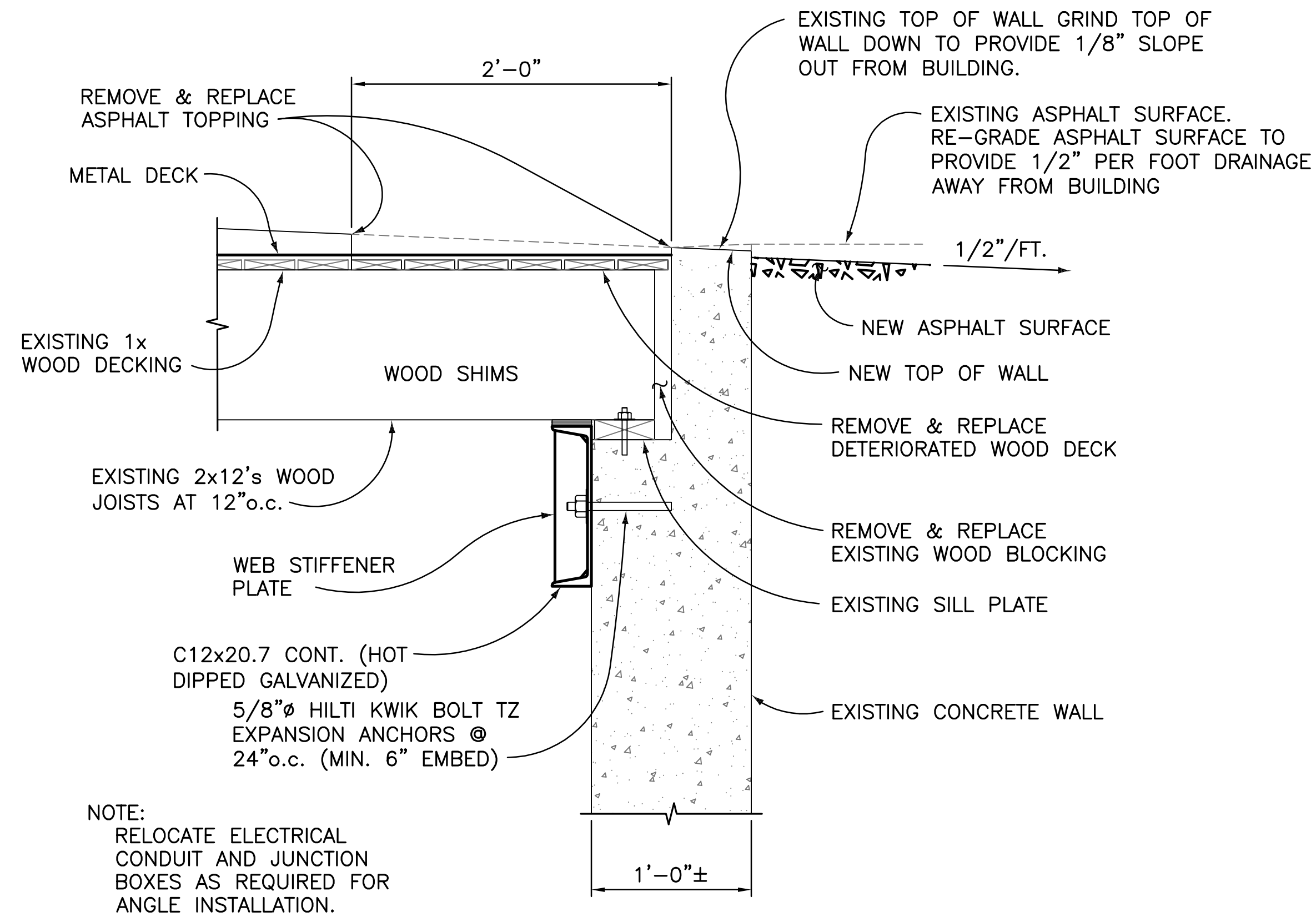
TITLE OF SHEET

TREATMENT RECOMMENDATION DRAWINGS
HS-11
UPPER GARAGE
HISTORIC HOUSING AREA
WIND CAVE NATIONAL PARK
HOT SPRINGS, SOUTH DAKOTA

DRAWING NO.
108
128878

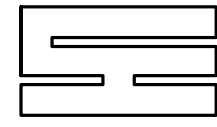
PMIS/PKG NO.
158029

SHEET
6 OF 7



A **SUPPORT OF FLOOR FRAMING**

1 1/2"=1'-0"

 STRUCTURAL ENGINEERING ASSOCIATES, INC. 1000 WALNUT SUITE 1570 KANSAS CITY, MO 64106 Ph. 816-421-1042 Fax 816-421-1061	DESIGNED:	SUB SHEET NO.	TITLE OF SHEET	DRAWING NO.
	RCJ			
	LEF			
	TECH. REVIEW:			
	DATE:	TS2	HS-11 UPPER GARAGE HISTORIC HOUSING AREA WIND CAVE NATIONAL PARK HOT SPRINGS, SOUTH DAKOTA	108
	1/27/16			128878
				PMIS/PKG NO.
				158029
				SHEET
				7 of 7

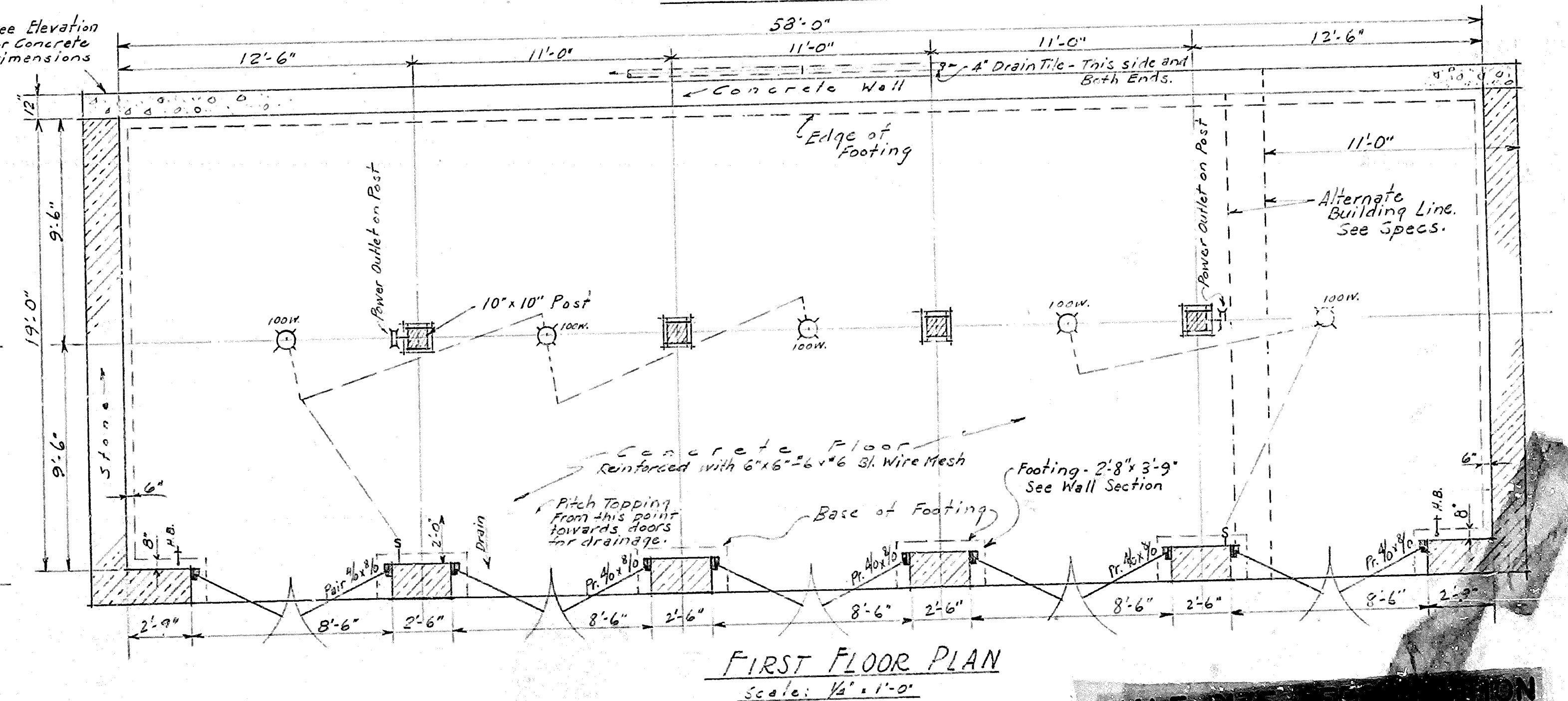
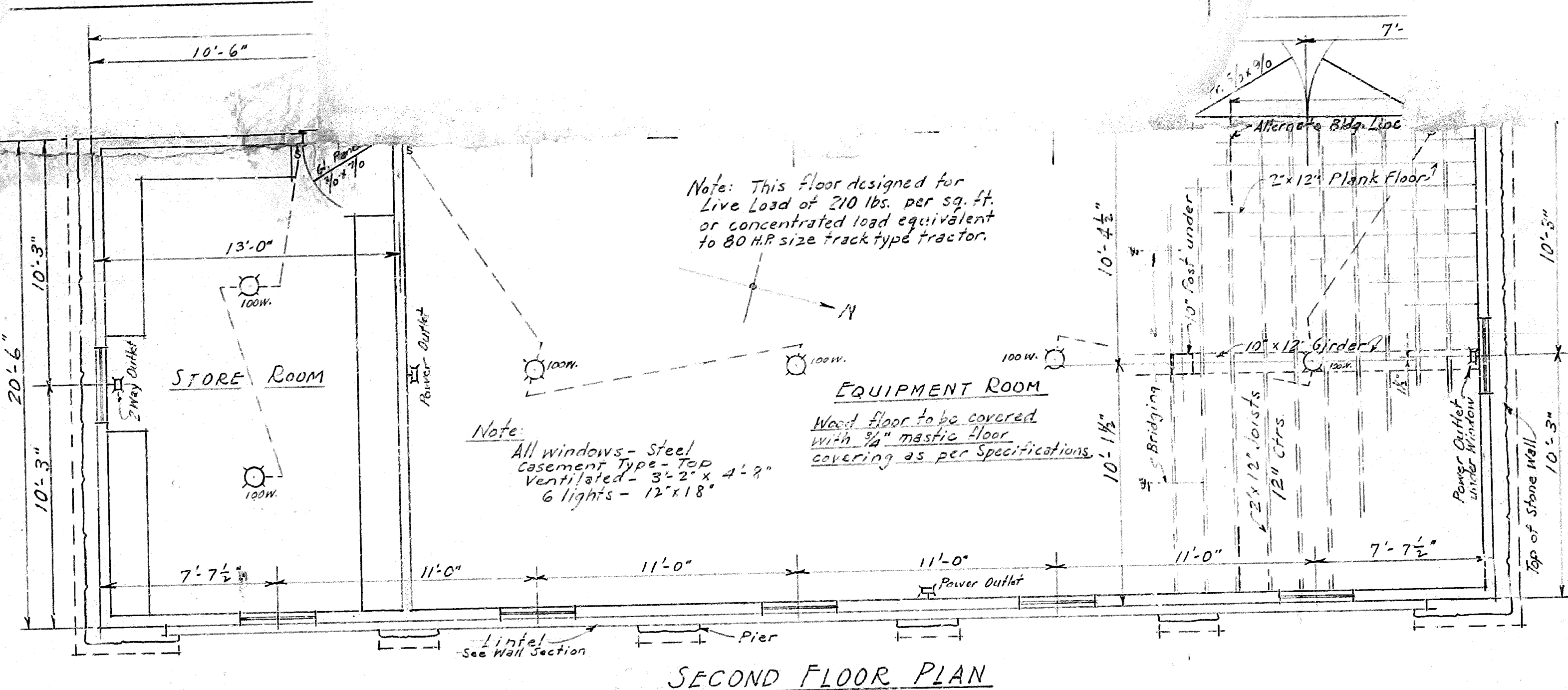
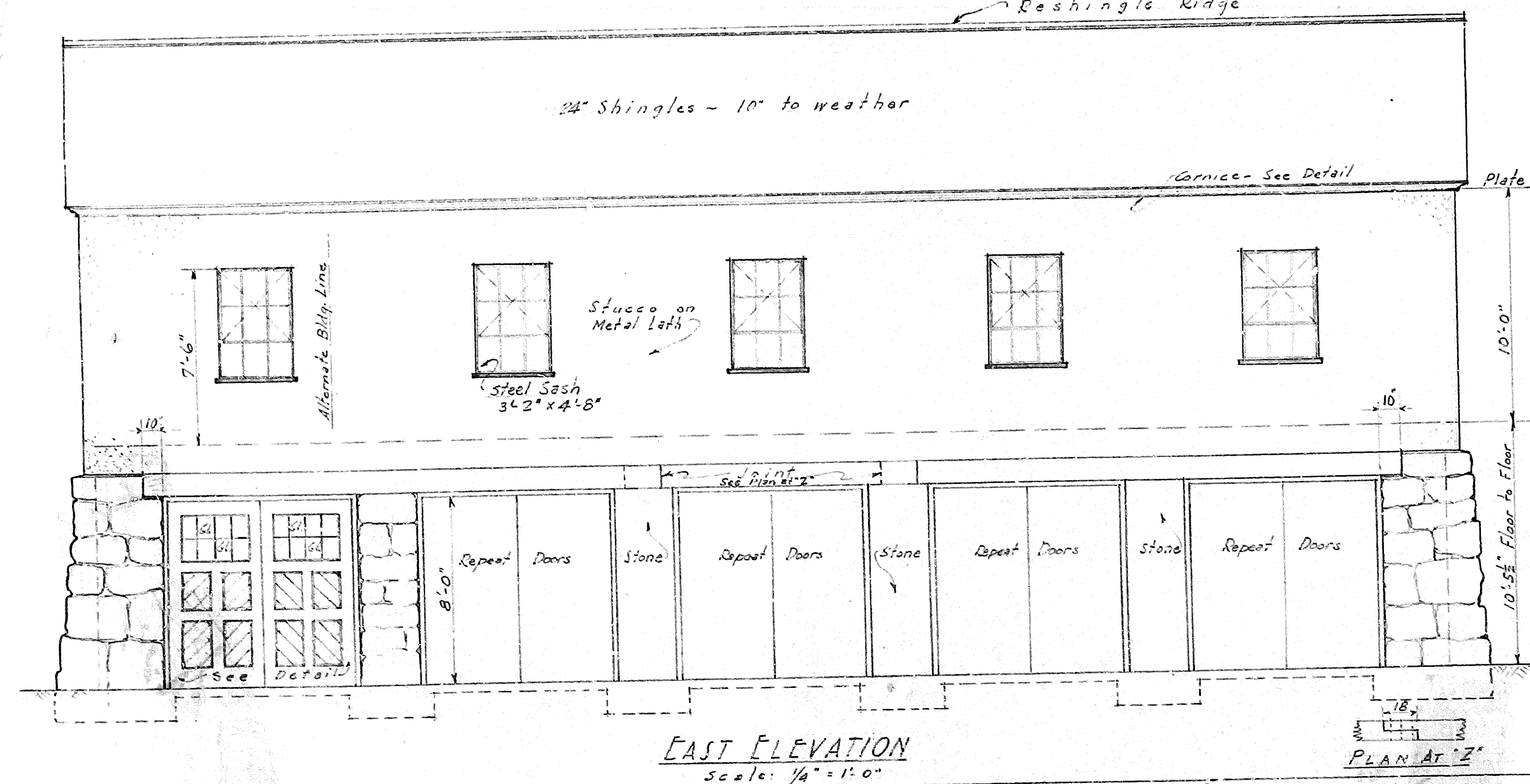
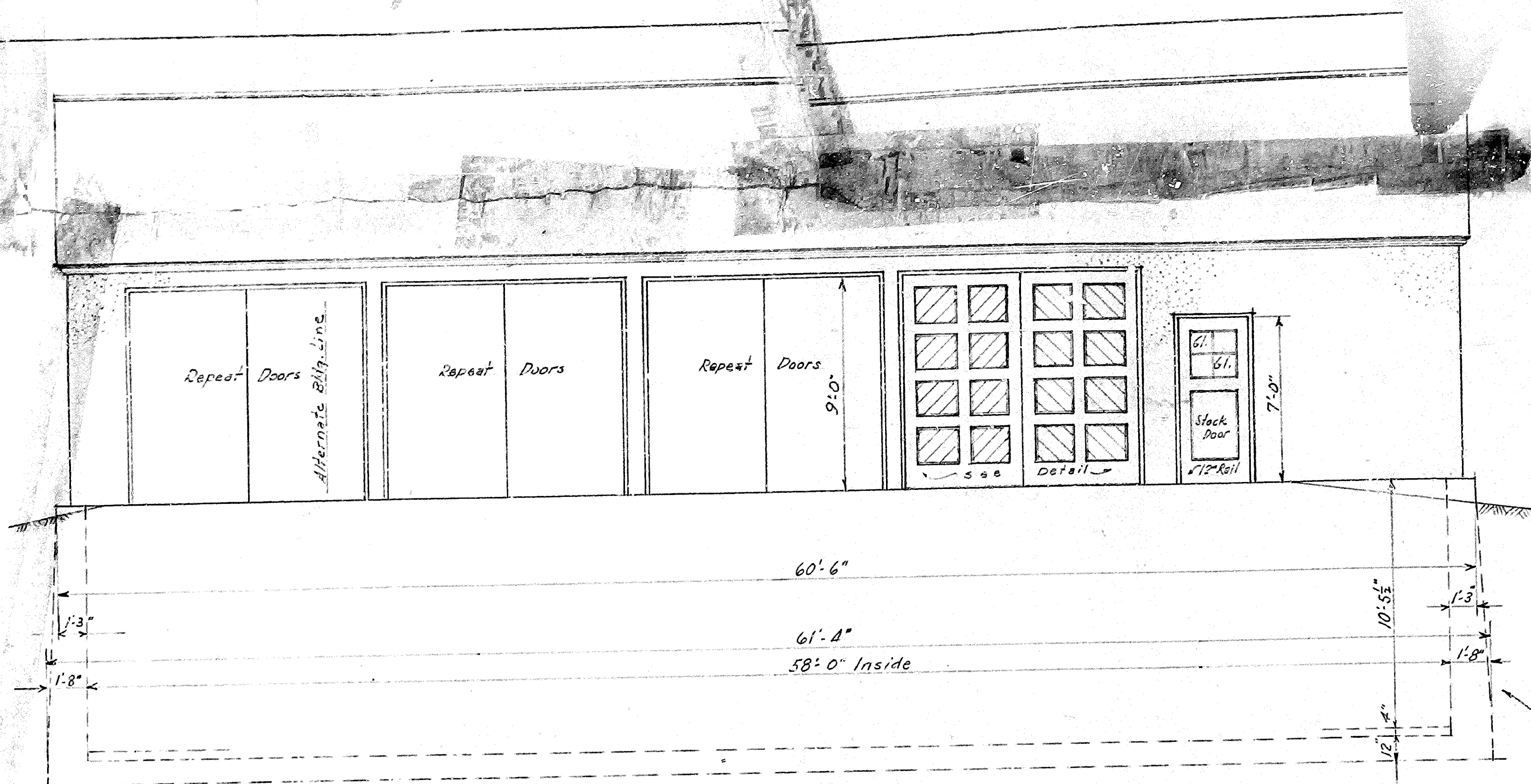


HS-11. ca. 1935. (WICA Museum Collection #WICA 4559)

Appendix A Historic Drawings

Appendix A
HS-11 Plan Pages

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	File Name	Building Number	Drawing Title	Issuing Office at US Dept of Int.	Drawn by	Drawing Date	Sheet # of #	Public Works Project No.	Recommended by and title	Recommend ed Date	Approved by and title	Approval Date	Job Completed Date	Notes
2	WICA_108_1004B_[id278464]	HS 11	Machine Shop Shed	Branch of Plans and Design	R.W.A.	9/18/1933	1 of 2	yes	Edward A Nickel?, for the Chief Architect	3/21/1933	Arno B Cammerer/ Director, NPS	1/6/1934	8/11/1934	Public Works Program, F.P. 202, Physical Improvements listed along top of drawing information block. East / West Elevation, plan
3	WICA_108_1004B_[id278464]	HS 11	Machine Shop Shed	Branch of Plans and Design	Corner Missing	9/18/1933	2 of 2	yes	Edward A Nickel?, for the Chief Architect	3/21/1933	Arno B Cammerer/ Director, NPS	1/6/1934	8/11/1934	Public Works Program, F.P. 202, Physical Improvements listed along top of drawing information block. North/ South Elevation, details, plan.



RECOMMENDED FOR THE CHIEF ARCHITECT			
Cleared for Eng.	9/22/33	Date	9/18/1933
Concurred	1-4-34	Date	Sheet No. 1 of 2 Sheets
Concurred	9-27-33	Date	Dwg. No. NC-1004B
Approved	1-6-34	Date	

Public Works Program, F.P. 202, Road & Improvements

U.S. DEPARTMENT OF INTERIOR - NATIONAL PARK SERVICE

WIND CAVE NATIONAL PARK

MACHINE SHOP SHED

DRAWN BY BRANCH OF PLANS AND DESIGN

106 comp. 7-11-34



HS-11. ca. 1940. (WICA Museum Collection #WICA 4557)

Appendix B Historic Photographs

Appendix B: Wind Cave Park-Selected Database and Photo Files *Italicized text added by Deb Sheals in 2015*

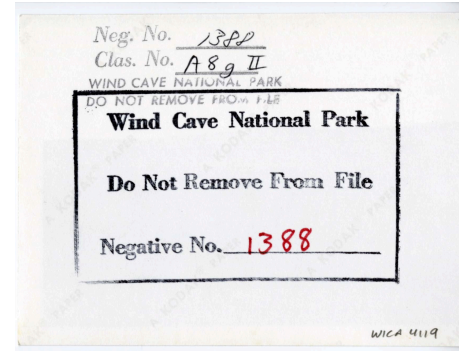
Primary HS# HS-11
Topic
HS-11

Photo Date *ca. 1934*
Date Source *other, see HSR notes*
Photographer

Manufact. Date

Below: Front of Image. Right: Back of Image

Catalog #
WICA
4119



HSR 2015 Notes

This building was completed 8/11/1934, per the original plans.



Park Database Description

Photographic print and negative of buildings - garage, building #11.

Photographic print is stored at Wind Cave National Park, and the nitrate negative is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files *Italicized text added by Deb Sheals in 2015*

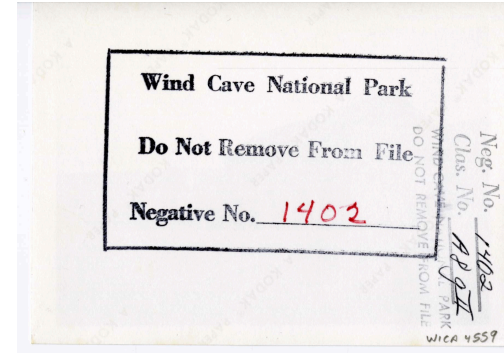
Primary HS# HS-03
Topic HS-11
HS-11 HS-13

Photo Date ca. 1935
Date Source "Manufactured Date"
Photographer

Manufact. Date 1935

Catalog #
WICA
4559

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

Park Database Description

Photographic Print and Negative of Buildings - Garage, Building #11. See Also 1402.

Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.



Appendix B: Wind Cave Park-Selected Database and Photo Files *Italicized text added by Deb Sheals in 2015*

Primary	HS#	<i>HS-07</i>	Photo Date	<i>ca. 1937</i>	HSR 2015 Notes
Topic		<i>HS-11</i>	Date Source	<i>other, see HSR notes</i>	<i>CCC Tree</i>
<i>General</i>			Photographer		<i>Planting</i>
<i>HS-07</i>					
<i>HS-11</i>					
Catalog #			Manufact. Date		
<i>WICA</i>					
<i>4208</i>					
			<i>Below: Front of Image. Right: Back of Image</i>		



Park Database Description
Photographic
Negative of
Landscaping - Tree
Moving. See Also
3496, 3497. Nitrate
Negative Is in Cold
Storage at the
Midwest
Archeological
Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files *Italicized text added by Deb Sheals in 2015*

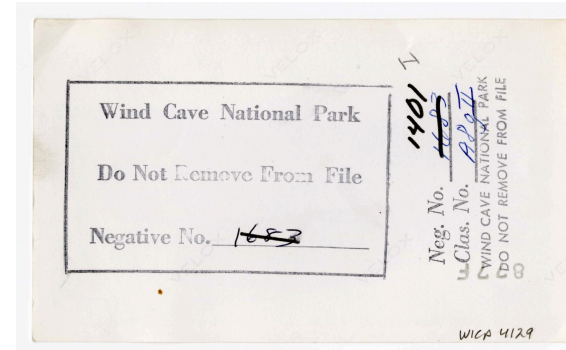
Primary HS# HS-11
Topic
HS-11

Photo Date ca. 1938
Date Source other, see HSR notes
Photographer

Manufact. Date

Catalog #
WICA
4129

Below: Front of Image. Right: Back of Image



HSR 2015 Notes

HS-11 was completed in 1934, HS-01, in background was built in 1935.



Park Database Description

Photographic Print and Negative of Buildings - Administration Building.

Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.

Appendix B: Wind Cave Park-Selected Database and Photo Files *Italicized text added by Deb Sheals in 2015*

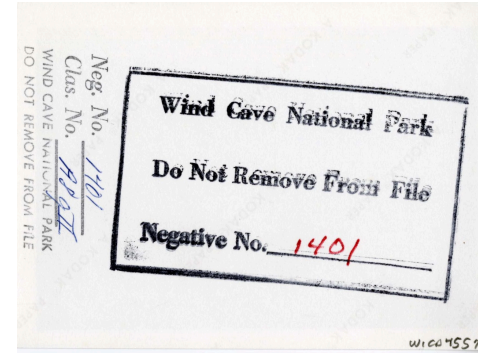
Primary HS# HS-11
Topic
HS-11

Photo Date ca. 1940
Date Source *other, see HSR notes*
Photographer

Manufact. Date

Below: Front of Image. Right: Back of Image

Catalog #
WICA
4557



HSR 2015 Notes

Probably taken a few years after this building was completed in 1934.

Park Database Description

Photographic Print and Negative of Buildings - Garage, Building #11. See Also 1401.

Photographic Print Is Stored at Wind Cave National Park, and the Nitrate Negative Is in Cold Storage at the Midwest Archeological Center.





HS-11 West Elevation. (SRJA 2014)

Appendix C Cost Estimate



CONSTRUCTION MANAGEMENT RESOURCES, LLC

ESTIMATING • SCHEDULING • PROJECT MANAGEMENT • CONSULTING
5201 JOHNSON DRIVE, SUITE 330, MISSION, KANSAS 66205 (913) 262-6715 • FAX (913) 262-1380

Historic Structures Report - Historic Housing Area
Wind Cave National Park - Hot Springs South Dakota
Susan Richards's Johnson & Associates
Final Report Estimate 01/27/2016

DESCRIPTION		Immediate	Short Term	Long Term
HS-11 Upper Garage				
01 00 00 GENERAL CONDITIONS	15%	5,606	-	10,629
02 41 00 DEMOLITION		-	-	-
02 50 00 HAZARDOUS MATERIAL ABATEMENT		-	-	1,500
03 30 00 CAST-IN-PLACE CONCRETE		1,800	-	-
04 01 20 MASONRY RESTORATION AND CLEANING		4,346	-	-
04 20 00 MASONRY		-	-	-
05 12 00 STEEL		1,450	-	-
06 10 00 ROUGH CARPENTRY		5,250	-	-
06 13 00 EXTERIOR RESTORATION		2,150	-	-
06 40 16 INTERIOR ARCHITECTURAL WOODWORK RESTORATION		-	-	-
07 14 00 FLUID-APPLIED WATERPROOFING		-	-	-
07 20 00 STUCCO REPAIRS		4,869	-	-
07 21 00 THERMAL INSULATION		-	-	-
07 50 00 ROOFING		-	-	15,574
07 60 00 SHEET METAL FLASHING AND TRIM		425	-	4,020
07 92 00 JOINT SEALANTS		250	-	-
08 11 00 DOOR & FRAMES		-	-	30,000
08 32 13 STORM WINDOWS		-	-	-
08 52 00 STEEL WINDOWS		300	-	17,500
08 71 00 DOOR HARDWARE		-	-	-
08 80 00 GLAZING		-	-	-
09 20 00 PLASTER REPAIR		-	-	-
09 21 16 GYPSUM SYSTEMS		-	-	-
09 64 00 WOOD FLOORING		-	-	-
09 90 00 PAINTING		3,821	-	516
10 14 00 SIGNS		-	-	-
10 28 00 TOILET AND BATH ACCESSORIES		-	-	-
10 44 00 FIRE-PROTECTION SPECIALTIES		-	-	-
21 00 00 FIRE PROTECTION		-	-	-
22 00 00 PLUMBING		-	-	-
23 00 00 HVAC		-	-	-
26 00 00 ELECTRICAL		500	-	1,750
31 20 00 EARTH MOVING		150	-	-
31 48 13 UNDERPINNING PIERS		-	-	-
32 13 13 CEMENT CONCRETE PAVING		10,260	-	-
32 92 00 LAWN & GRASSES		-	-	-
33 10 00 WATER DISTRIBUTION		-	-	-
33 30 00 SANITARY SEWERAGE		-	-	-
33 40 00 STORM DRAINAGE		1,800	-	-
33 46 16 FOUNDATION DRAINAGE SYSTEMS		-	-	-
subtotal		42,977	-	81,489
Contractor's Fee	10%	4,298	-	8,149
subtotal		47,274	-	89,638
Design/Estimate Contingency	25%	11,819	-	22,409
subtotal		59,093	-	112,047
Escalation to Mid-Point - 04/15/2017	3.7%	2,170	-	4,116
TOTAL		61,263	-	116,163

*NOTE: Ground disturbance may require archeological monitoring. Costs for monitoring are not included in estimate.

DESCRIPTION	QUANTITY	UNIT	\$	TOTAL	Immediate	Short Term	Long Term
HS-11 Upper Garage							
02 41 00 DEMOLITION				0	0		
				0	0	0	0
02 50 00 HAZARDOUS MATERIAL ABATEMENT							
Long Term							
Comprehensive Hazardous Material Survey related to Windows	1	LS	1,500.00	1,500			1,500
Extent of hazardous materials needs to be determined before accurate estimate can be rendered				1,500	0	0	1,500
03 30 00 CAST-IN-PLACE CONCRETE							
Immediate							
Install Curb in Garage	4	EA	150.00	600	600		
Grind Top of Foundation Down @ OH Doors	4	EA	300.00	1,200	1,200		
				1,800	1,800	0	0
04 01 20 MASONRY RESTORATION AND CLEANING							
Immediate							
Stone Repointing	52	SF	8.00	418	418		
Mortar Wash Repair	42	LF	8.00	336	336		
Stone Cleaning	349	SF	6.00	2,091	2,091		
Stone Replacement	6	EA	250.00	1,500	1,500		
				4,346	4,346	0	0
04 20 00 MASONRY							
				0	0	0	0
05 12 00 STEEL							
Immediate							
Add Steel Chanel @ West Foundation w/ Expansion Anchors	58	LF	25.00	1,450	1,450		
				1,450	1,450	0	0
06 10 00 ROUGH CARPENTRY							
Immediate							
Replace Deteriorated Wood Decking @ OH Doors ALLOWANCE	40	SF	10.00	400	400		
Replace Deteriorated Wood Blocking @ West Foundation Wall	58	EA	75.00	4,350	4,350		
Replace Deteriorated Sill Plate ALLOWANCE	1	LS	500.00	500	500		
				5,250	5,250	0	0
06 13 00 EXTERIOR RESTORATION							
Immediate							
Wood Rot Repair on West OH Doors	1	LS	300.00	300	300		
Misc Exterior Trim Repair	3	Loc	100.00	300	300		
Replace Window Sill	5	EA	250.00	1,250	1,250		
Screen Wood Louver Vents	6	EA	50.00	300	300		
				2,150	2,150	0	0
06 40 16 INTERIOR ARCHITECTURAL WOODWORK RESTORATION							
				0	0		
				0	0	0	0
07 14 00 FLUID-APPLIED WATERPROOFING							
				0			0
				0	0	0	0
07 20 00 STUCCO REPAIRS							
Immediate							
STUCCO Wall Repair (allow 10%)	137	SF	30.00	4,119	4,119		
STUCCO Crack Repair	15	LF	50.00	750	750		
				4,869	4,869	0	0
07 21 00 THERMAL INSULATION							
				0			0
				0	0	0	0
07 50 00 ROOFING							
Demo Roofing and Install New Decra Steel Roofing System	1,298	SF	12.00	15,574			15,574
				15,574	0	0	15,574
07 60 00 SHEET METAL FLASHING AND TRIM							
Immediate							
Extend Roof Gutter to the South	1	LS	125.00	125	125		
New Downspout Extensions	2	EA	150.00	300	300		
New Gutter Covers	120	LF	5.00	600			600
Long Term							
New Custom Box Gutters	120	LF	25.00	3,000			3,000
Custom Downspouts	28	LF	15.00	420			420
				4,445	425	0	4,020
07 92 00 JOINT SEALANTS							
Immediate							
Misc Exterior Caulking	1	LS	250.00	250	250		
				250	250	0	0

DESCRIPTION	QUANTITY	UNIT	\$	TOTAL	Immediate	Short Term	Long Term
HS-11 Upper Garage							
08 11 00 DOOR & FRAMES							
Long Term							
Replace OH Doors on West Elevation	4	EA	7,000.00	28,000			28,000
Replace Door 201-1	1	EA	2,000.00	2,000			2,000
				30,000	0	0	30,000
08 32 13 STORM WINDOWS							
				0	0	0	0
08 52 00 STEEL WINDOWS							
Immediate							
Replace Broken Glass	1	EA	300.00	300	300		
Long Term							
Comprehensive Window Survey and Restoration	7	EA	2,500.00	17,500			17,500
				17,800	300	0	17,500
08 71 00 DOOR HARDWARE							
				0	0		
				0	0	0	0
08 80 00 GLAZING							
				0			0
				0	0	0	0
09 20 00 PLASTER REPAIR							
				0	0		
				0	0	0	0
09 21 16 GYPSUM SYSTEMS							
				0			0
				0	0	0	0
09 64 00 WOOD FLOORING							
				0			0
				0	0	0	0
09 90 00 PAINTING							
Immediate							
Touch up Paint/Stain Exterior Trim	1	LS	200.00	200	200		
Touch up Paint Steel Windows	7	EA	125.00	875	875		
Paint STUCCO	1,373	SF	2.00	2,746	2,746		
Long Term							
Paint Floor in Rm 201	258	SF	2.00	516			516
				4,337	3,821	0	516
10 14 00 SIGNS							
				0			0
				0	0	0	0
10 28 00 TOILET AND BATH ACCESSORIES							
				0			0
				0	0	0	0
10 44 00 FIRE-PROTECTION SPECIALTIES							
				0			0
				0	0	0	0
21 00 00 FIRE PROTECTION							
not applicable				0	0		
				0	0	0	0
22 00 00 PLUMBING							
not applicable				0	0		
				0	0	0	0
23 00 00 HVAC							
not applicable				0	0		
				0	0	0	0
26 00 00 ELECTRICAL							
Immediate							
Relocate Electrical Conduit & Boxes at West Foundation Wall As Needed	1	LS	500.00	500	500		
Long Term							
Replace Exterior Light Fixtures	2	EA	875.00	1,750			1,750
				2,250	500	0	1,750
31 20 00 EARTH MOVING							
Immediate							
Regrade at SW Corner	1	LS	150.00	150	150		
				150	150	0	0
31 48 13 UNDERPINNING PIERS							
				0	0		
				0	0	0	0

DESCRIPTION	QUANTITY	UNIT	\$	TOTAL	Immediate	Short Term	Long Term
HS-11 Upper Garage							
32 13 13 CEMENT CONCRETE PAVING							
Immediate							
Sawcut and install Soft Joint @ Stone	24 LF	:	40.00	960	960		
Retaining Wall @ SW Corner	4 LF	:	150.00	600	600		
Mill paving for New Swale	580 SF	:	10.00	5,800	5,800		
Mill paving Inside of Building	92 SF	:	25.00	2,300	2,300		
Repair Divots inside Building	4 EA	:	150.00	600	600		
				10,260	10,260	0	0
32 92 00 LAWN & GRASSES							
				0	0		
				0	0	0	0
33 10 00 WATER DISTRIBUTION							
				0			0
				0	0	0	0
33 30 00 SANITARY SEWERAGE							
				0			0
				0	0	0	0
33 40 00 STORM DRAINAGE							
Immediate							
Install Trench Drain	60 LF	:	30.00	1,800	1,800		
				1,800	1,800	0	0
33 46 16 FOUNDATION DRAINAGE SYSTEMS							
				0			0
				0	0	0	0