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STRUCTURAL CONDITION ASSESSMENT

ALLEN JAY ROCK GYM
1201 FAIRFIELD ROAD
HIGH POINT, NC

Prepared for: Guilford County Schools
617 West Market Street
Greensboro, NC

Prepared by: Adrian S. Durham, PE, SE, LEED AP
Principal
Structural Capacity, PC

January 04, 2012

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1. INTRODUCTION

Structural Capacity, PC was retained by Guilford County Schools to observe and assess the structural condition of the historic Allen Jay Rock Gymnasium located at 1201 East Fairfield Road in High Point, NC. The structure is currently vacant and in need of varying degrees of repair before re-occupation.

The scope of this assessment included reviewing the condition of the building envelope, roof framing, floor framing and foundation elements. The review was limited to accessible areas and elements with the main focus concentrated on the current gymnasium space.

A non-destructive approach was implemented throughout the accessible areas. No material testing or digging was performed. Construction documents for the building were not available for review at the time of assessment.

For this report and assessment the front elevation (East Fairfield Road elevation) has been established as the south elevation. Additional clarification regarding building orientation and established cardinal directions can be obtained from the structural survey drawings provided in the appendix of this report.

Recommendations provided in this report are based on information gathered from observations conducted in December 2012 and current building code standards.

2. BACKGROUND

The Allen Jay Rock Gymnasium is a stone masonry facility constructed in 1939 as a project of the Works Progress Administration (Photo 1). It is located near the intersection of East Fairfield Road and Allen Jay Road. The structure is approximately 11,000 square feet and currently composed of a gymnasium, two story classroom space, partial basement and storage areas.

The structure is listed on the National Register of Historic Places. The gymnasium is currently vacant and owned by Guilford County Schools. Guilford County Schools is considering repairing and renovating the building for use as an assembly space with conference rooms and storage spaces.

The roof is comprised of wood decking, wood rafters, wood beams and field fabricated, built up roof trusses. The floor at the gymnasium consists of hardwood flooring supported by wood decking, floor joists and sawn lumber beams. The foundation elements include concrete footings and solid grouted brick masonry piers.

3. OBSERVATION

3.1 Building Envelope

Assessment of the main roof structure was limited due to inaccessibility. The finished roofing appeared to be weathered and deteriorated. Rain leaks have been observed in the interior of the building, which may be a function of the current condition of the roof. Consideration should be given to replacing/repairing the roof to prevent potential water infiltration and damage.

A breach in the roof was observed at the rear storage area (Photo 15). The ceiling at the roof breach has collapsed allowing significant water collection on the floor (Photo 16). A significant rain event occurred during the observation. Approximately ½ inch of water with debris was observed at the floor in the storage area (Photo 17). Based on conversation with staff personnel, consideration has been given to demolishing the rear storage area. The roof and ceiling should be repaired if the storage area is not demolished.

The stone masonry walls appeared to be in good condition. No significant cracks, spalls or deterioration was observed on the exterior face of the stone masonry walls. Some vegetation growth was observed on the west elevation (Photo 42). The vegetation may present a risk to the integrity of the walls and should be removed.

The building has been subject to random vandalism. The majority of the window glazing have either been broken from vandalism or boarded. At the south elevation there are (12) windows, (9) shattered, (2) boarded and (1) undamaged. At the west elevation there are (5) windows, (2) shattered, (1) boarded and (1) undamaged. At the north elevation there are (9) windows, (3) shattered and (6) undamaged. At the east elevation there are (2) windows, both are boarded. All damaged and boarded windows should be replaced. Additional security lighting should be considered to deter vandalism.

The aluminum gutters are damaged at the south and north elevations of the building. At the south elevation a section of the aluminum gutter has come unattached from the roof and is hanging towards the ground (Photo 13). At the north elevation the aluminum gutter is bowed and warped (Photo 14). The damaged aluminum gutters should be replaced.

3.2 Ramps and Stairs

A concrete ramp and landing lead to the front entrance of the building (Photo 6). The ramp appears weathered but in fair condition with no significant cracks, spalls, or structural degradation.

Stone masonry steps with a concrete topping are located on both sides of the concrete entry landing (Photos 8-9). The concrete topping appears weathered with cracks up to 1/8 inch wide. The cracks should be repaired to minimize the potential for pedestrian tripping and water infiltration damage.

A wood ramp and landing is located at the rear of the building at the southeast corner (Photos 9-10). The wood at the ramp appeared to be slightly weathered and intermittent soft wood areas was observed by tapping members with a blunt object. The wood ramp appeared to be performing adequately.

A steel stair is located at the west elevation of the building leading to a second story entrance (Photos 11-12). The paint coating has significantly deteriorated with bare metal exposed at the majority of the stair system. Corrosion has begun to set in but no significant section loss was observed at the time of observation. The coatings should be repaired to prevent steel degradation.

3.3 Roof Framing

3.3.1 Decking

The roof decking consists of 6 inch wide wood boards. The depth of the boards could not be verified, but based on common construction practice it is assumed that the decking is 1x6 boards. No significant damage or deterioration was observed at the roof decking

3.3.2 Rafters

The roof decking is supported by 2x6 wood rafters at 24 inches on center. No significant damage or deterioration was observed at the wood rafters.

3.3.3 Beams

The 2x6 rafters are supported by 4ply, 1-7/8 inch (wide) [7-1/2 inch total width] x10 inch (deep) beams. The beams are located at the top chord panel points of the supporting built up wood trusses. No significant damage or deterioration was observed at the wood beams.

3.3.4 Trusses

The beams are supported by (8) built up wood trusses. The geometry and truss member sizes are shown on the truss elevation, in the survey drawings, in the appendix. Truss member designations are provided on the roof framing plan in the appendix.

Notable lateral deflection/movement was observed at the truss bottom chord by hand shaking. Consider adding 2x10 bracing connecting the truss bottom chords to provide additional lateral stability.

3.3.4.1 Truss 1

An approximately 1/16 inch wide crack was noted in the south stone masonry wall below Truss 1 (Photo 35). The crack extends down to the top of the window opening (Photo 36). The crack does not present a significant structural hazard at this time but should be monitored for further degradation.

Section loss was observed at the first truss web from the south exterior wall (Photo 37). The section loss does not present a significant structural hazard at this time but should be monitored for further degradation.

No other notable deficiencies were observed.

3.3.4.2 Truss 2

Section loss was observed at the top chord, north of the ridge beam (Photo 38). The section loss does not present a significant structural hazard at this time but should be monitored for further degradation.

Section loss was observed at the second truss web from the north exterior wall (Photo 39). The section loss does not present a significant structural hazard at this time but should be monitored for further degradation.

No other notable deficiencies were observed.

3.3.4.3 Truss 3

A bow in the truss bottom chord was observed (Photo 40). It was unclear whether the bow is a function of structural loading or initial straightness of the lumber. The bow should be monitored for further movement.

No other notable deficiencies were observed.

3.3.4.4 Truss 4

A 1/8 inch (wide) x 3-1/2 inch long vertical crack was observed in the bottom chord below the first web from the south wall (Photo 41). The crack does not present a significant structural hazard at this time but should be monitored for further degradation.

A bow in the truss bottom chord was observed. It was unclear whether the bow is a function of structural loading or initial straightness of the lumber. The bow should be monitored for further movement.

No other notable deficiencies were observed.

3.3.4.5 Truss 5

No notable or significant deficiencies were observed.

3.3.4.6 Truss 6

No notable or significant deficiencies were observed.

3.3.4.7 Truss 7

No notable or significant deficiencies were observed.

3.3.4.8 Truss 8

No notable or significant deficiencies were observed.

3.4 Floor

3.4.1 Finish Floor

The finished flooring consists of 1 inch hardwood flooring. The hardwood finished floor appeared to be in good structural condition (Photo 18) except at areas with deteriorated floor framing, as noted on the

floor framing plan in the appendix. The hardwood flooring will need to be replaced at areas of deteriorated floor framing.

3.4.2 Sub Floor

The sub flooring consists of 1 inch hardwood flooring. The sub floor was inaccessible except at the access hole cut into the floor (Photo 19) and therefore could not be assessed.

3.4.3 Floor Decking

The decking consists of 1x6 tongue and groove diagonal boards (Photo 20). Areas of decking affected by deterioration and/or rot (Photos 27&29) are noted on the floor framing plan in the appendix. The deteriorated decking should be replaced. No significant damage was observed beyond the noted areas of deteriorated floor framing.

3.4.4 Floor Joists

The floor joists consist of full sawn 2x10 members. A white rot or fungus was observed in exterior bays noted on the floor framing plan, in the appendix (Photos 26-28). The deteriorated joists should be replaced.

No significant damage or deterioration was observed beyond the noted deteriorated areas.

3.4.5 Floor Beams

The floor beams consist of a built up 6-3/4 inch (wide) x 7-1/2 inch (deep) full sawn section with a full sawn 2 inch (deep) x 7-1/2 (wide) top plate (Photos 24-25). No significant damage or deterioration was observed at the floor beams.

3.5 Basement

Structural observation was limited in the basement. Most of the structural components were concealed by the finished ceiling and walls and therefore not accessible. A significant rain event occurred during the observation. Approximately 2 inches of water was observed at the basement floor. Additional investigation should be performed to determine the source of water infiltration. Installation of a sump pump to minimize flooding should be considered.

3.6 Foundation

The floor beams are supported by 12 inch x 16 inch solid grouted brick masonry piers (Photo 21). No significant damage or deterioration was observed at the piers.

The brick masonry piers are supported by concrete spread footings. The minimum observed spread footing size was 2 foot 6 inches x 2 foot 6 inches. The spread footing depth could not be determined due to inaccessibility. No significant damage or deterioration was observed at the concrete footing.

Vegetation is present directly adjacent to the south exterior wall (Photo 13). Due to its proximity, the vegetation root system could potentially disturb the building foundation. Consideration should be given to moving the vegetation further away from the building.

4.0. STRUCTURAL ANALYSIS

4.1 Roof

The current roof composition at the gymnasium consists of 1 inch x 6 inch decking, 2 inch x 6 inch joists and 7-1/2 inch x 10 inch beams. It is assumed that the finished roofing consists of 1 layer of asphalt shingles but could not be verified due to the roof inaccessibility. Additional clarification regarding roof framing at gymnasium can be obtained from the roof framing plan provided in the appendix.

The 1 inch x 6 inch decking, 2 inch x 6 inch joists and 7-1/2 inch x 10 inch and built up roof trusses were analyzed to assess the roof load capacity at the gymnasium.

The code prescribed minimum roof live load is 20 psf. The dead load of the current roof system based on the above stated roof composition is approximately 10 psf. The total roof loading at the gymnasium is 30 psf.

According to our analysis the existing roof framing (including decking, rafters, beams and trusses), is adequate to support the code prescribed roof loading without any structural reinforcement. If a ceiling system consisting of joists and decking is desired at the time of renovation, the trusses should be re-evaluated and reinforcement may be required.

4.2 Floor

The current floor composition at the gymnasium consist of 2 layers of 1 inch hardwood flooring, 1 inch x 6 inch diagonal decking, 2 inch x 10 inch joists and 6-3/4 inch x 7-1/2 inch beams. Additional clarification regarding floor framing at the gymnasium can be obtained from the structural survey drawings provided in the appendix.

The 1 inch x 6 inch diagonal decking, 2 inch x 10 inch joists and 6-3/4 inch x 7-1/2 inch beams were analyzed to assess the floor load capacity at the gymnasium. Based on our analysis and the obtained field dimensions, the floor system has a total load capacity of 130 psf.

The anticipated code prescribed live load for the proposed renovated space is 100 psf. The dead load of the current floor system is 21 psf. The total anticipated floor loading for the proposed renovated space is 121 psf.

According to our analysis the existing floor, after replacement of all damaged joists and decking, is adequate to support the anticipated renovated floor loading without any structural reinforcement. If the desired renovated floor loading demand exceeds the above stated criteria, the floor should be re-analyzed by a licensed engineer in the state of North Carolina and structural reinforcement may be required.

5. SUMMARY/RECOMMENDATIONS

5.1 Building Envelope (Refer to section 3.1)

1) Replace/repair existing roofing.
2) Demolish rear storage building or repair roofing, roof framing and ceiling.
3) Remove vegetation growing on the west wall.
4) Replace all damaged and/or non-operable windows.
5) Consider additional security lighting to deter vandalism.
6) Repair/replace damaged aluminum gutters.

5.2 Ramps/Stairs (Refer to section 3.2)

1) Repair cracks in concrete topping at steps at the south building entrance.
2) Repair coatings at the west elevation stair.

5.3 Trusses (Refer to section 3.3.4)

1) Monitor crack at the inside face of the south exterior wall below Truss 1 for movement and growth.
2) Monitor web section loss at Truss 1 for continued section degradation.
3) Monitor section loss at the top chord of Truss 2 for continued section degradation.
4) Monitor web section loss at Truss 2 for continued section degradation.
5) Monitor bow in bottom chord of Truss 3 for additional warping and deflection.
6) Monitor vertical crack in bottom chord of Truss 4 for additional movement.
7) Monitor bow in the bottom chord of Truss 4 for additional warping and deflection.
8) Provide 2x10 bracing for additional lateral stability at the truss bottom chord.

5.4 Floor (Refer to section 3.4)

1) Replace damaged hardwood flooring above deteriorated floor joists.
2) Replace damaged/deteriorated decking.
3) Replace all damaged/deteriorated floor joist with pressure treated joists.
4) Consider implementing active moisture control measures (i.e. vapor barrier, additional ventilation, waterproof membrane) in the crawl space to limit potential water damage to the floor framing.
5) Consider a chemical (borate) treatment for the floor framing.

5.5 Basement (Refer to section 3.5)

1) Perform additional studies/investigation to determine the source of water infiltration.
2) Consider providing a sump pump to minimize flooding.

5.6 Foundation (Refer to section 3.6)

1) Remove or move vegetation directly adjacent to the south elevation. If vegetation is desired, maintain a 5 foot minimum buffer area between the exterior wall and vegetation.

6. PHOTOS

Photo 1: Work Projects Administration Plaque at Entrance

Photo 2: South Elevation (View from East Fairfield Road)

Photo 3: West Elevation (View from North Hall Street)

Photo 4: North Elevation (View from Pegram Avenue)

Photo 5: East Elevation (View from Allen Jay Road)

Photo 6: Main entry concrete ramp

Photo 7: Left side concrete stair (facing main entry)

Photo 8: Right side concrete stair (facing main entry)

Photo 9: Wood beam and joist at rear deck and ramp

Photo 10: Wood post, railing and decking at rear deck and ramp

Photo 11: Exterior steel stair at west elevation

Photo 12: Side view of exterior steel stair

Photo 13: Damaged/down gutter south elevation (View from East Fairfield Road)

Photo 14: Damaged gutter north elevation (View from Pegram Avenue)

Photo 15: Breach in roof at rear storage area

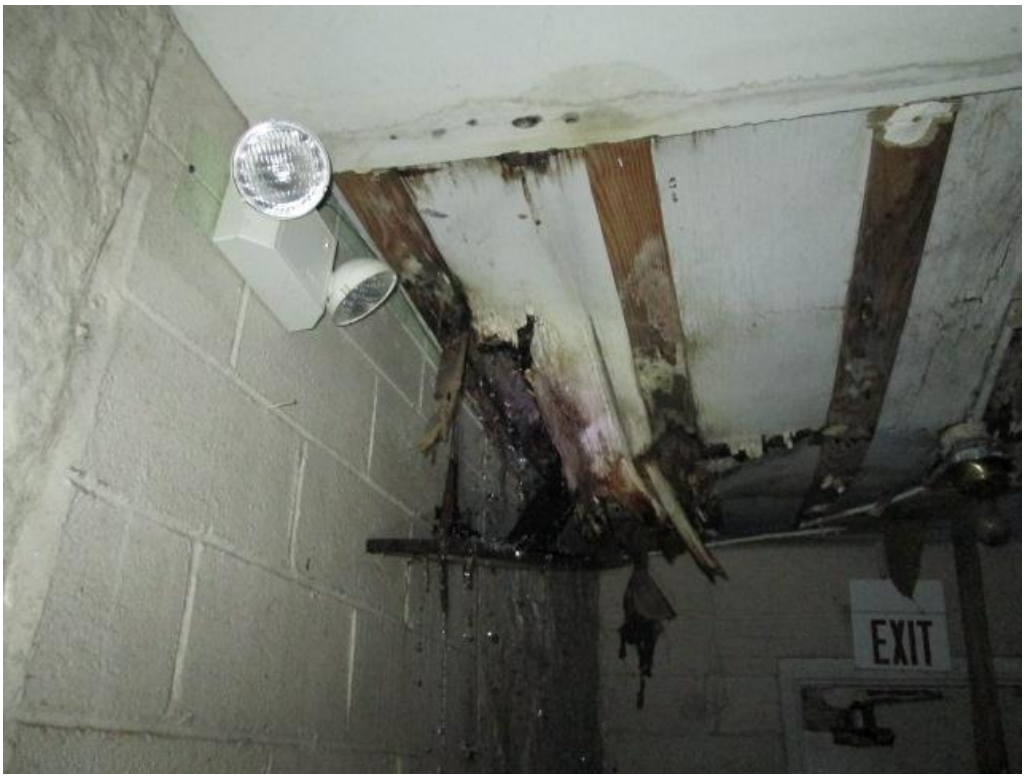


Photo 16: Collapsed ceiling at breached roof of rear storage area

Photo 17: Water and debris on floor at breached roof of rear storage area

Photo 18: Existing hardwood flooring at gymnasium

Photo 19: Gymnasium floor composition

Photo 20: Diagonal 1x6 decking at gymnasium floor

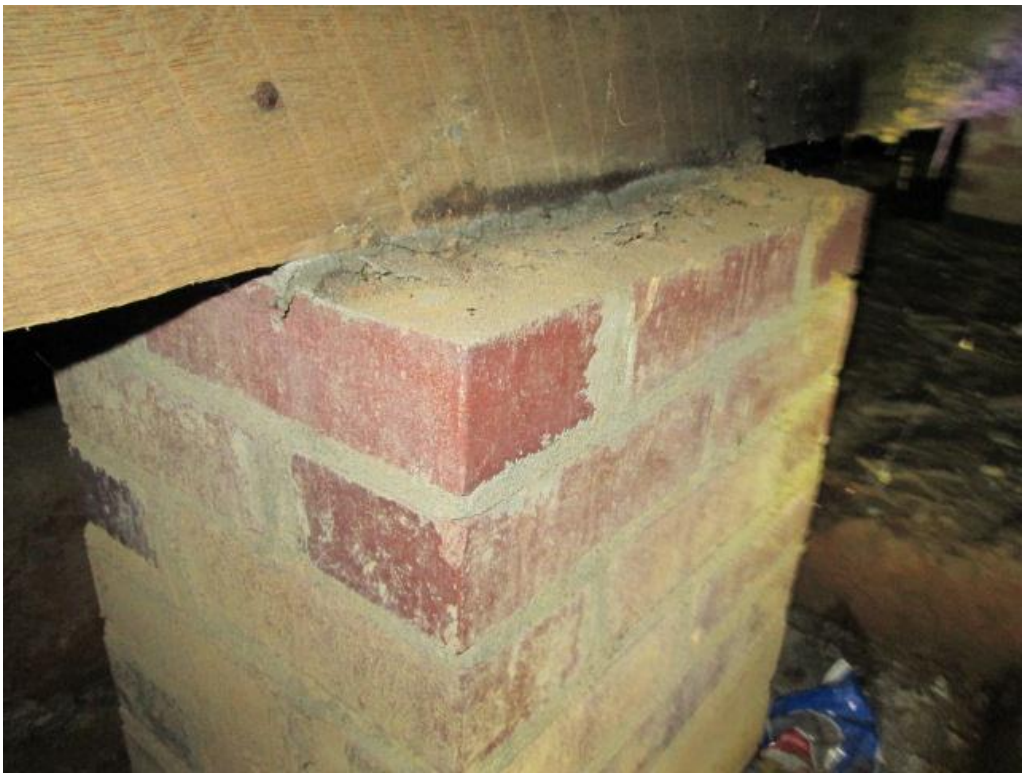


Photo 21: Fully grouted brick masonry pier in crawl space

Photo 22: Floor framing at gymnasium

Photo 23: Floor joist bearing at exterior stone masonry wall

Photo 24: Beam bearing at exterior stone masonry wall

Photo 25: Beam bearing at interior CMU basement wall

Photo 26: Decayed floor joist with white mold at north, exterior stone masonry wall

Photo 27: Decayed floor joist and decking with white mold at north, exterior stone masonry wall

Photo 28: Decayed floor joist with white mold at south, exterior stone masonry wall

Photo 29: Damaged floor joists at south, exterior stone masonry wall

Photo 30: Built up roof trusses at gymnasium

Photo 31: Roof truss bearing at exterior stone masonry wall

Photo 32: Roof system at gable end

Photo 33: Ridge beam, rafters and threaded rod hanger connection

Photo 34: Threaded rod hanger to bottom chord connection.

Photo 35: Crack below Truss 1 at south, exterior stone masonry wall

Photo 36: Crack below Truss 1 down to window opening

Photo 37: Section loss Web at Truss1

Photo 38: Section loss top chord of Truss 2

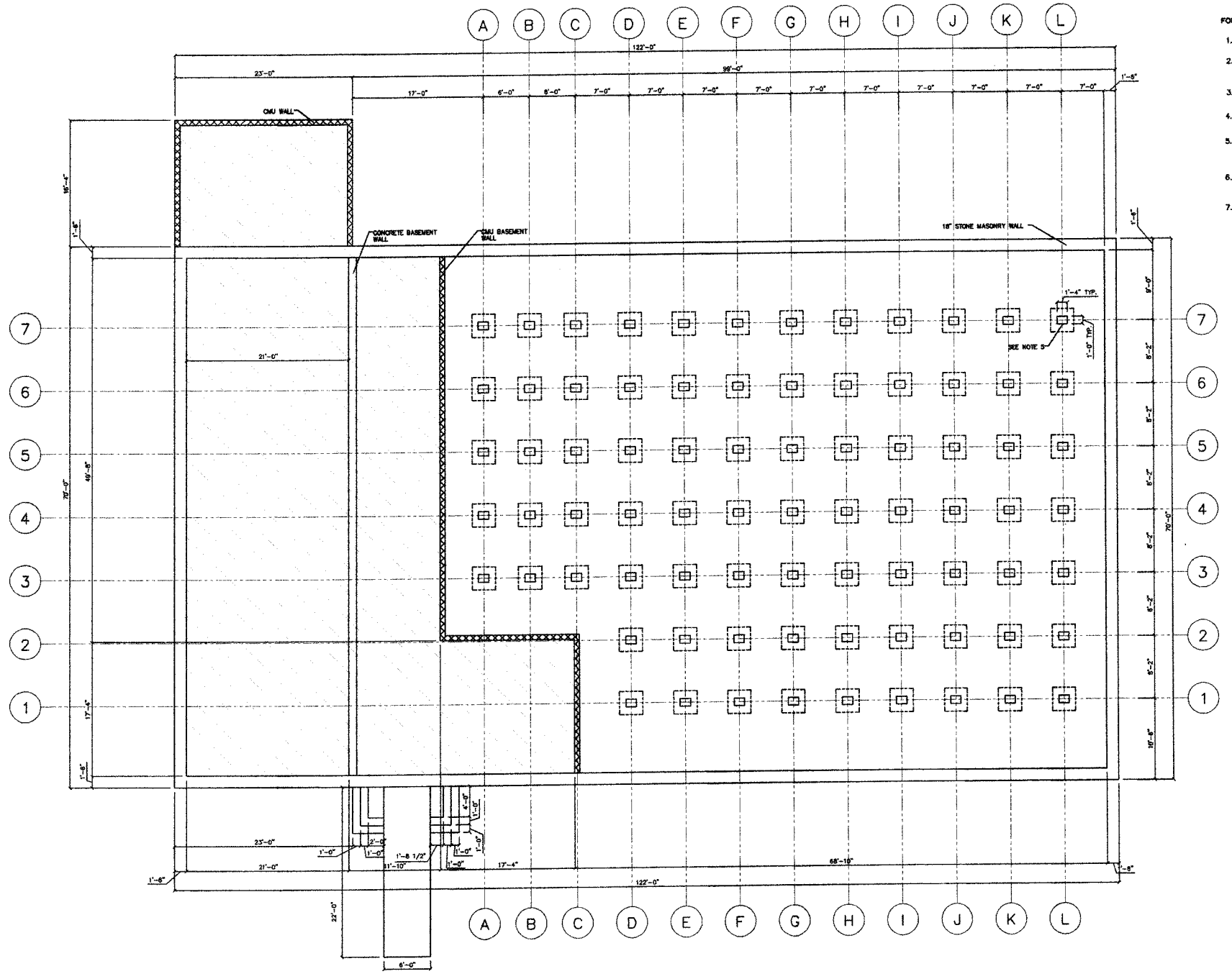
Photo 39: Section loss at web at Truss 2

Photo 40: Warped bottom chord at Truss 3

Photo 41: Crack at bottom chord of Truss 4

Photo 42: Vegetation growth on west elevation stone masonry walls

7. APPENDIX – Structural Survey & Assessment Drawings



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FOUNDATION PLAN NOTES

1. ALL DIMENSIONS BASED ON FIELD MEASUREMENTS OBTAINED BY STRUCTURAL CAPACITY, PC.
2. DATUM ELEVATION (+0'-0") = FINISHED FLOOR ELEVATION (FFE). ALL ELEVATIONS ARE REFERENCED FROM FFE.
3. T/FTG ELEVATION = -3'-10 1/2"
4. T/PIER = (+/-)-1'-10 1/2"
5. 12"X16" SOLID GROUTED BRICK MASONRY PIER WITH CONCRETE FOOTING 2'-6" X 2'-6"(MINIMUM)
6. AREA OF LIMITED STRUCTURAL SURVEY DUE TO INACCESSIBILITY OF STRUCTURAL MEMBERS.
7. FOUNDATION HAS BEEN RATED FOR 130 PSF TOTAL LOAD CAPACITY

FOUNDATION PLAN

1/8"=1'-0"

ALLEN
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NORTH CAROLINA ENGINEERING CORPORATION
CERT. NO. C-3406
STRUCTURAL CAPACITY, PC

NORTH CAROLINA PROFESSIONAL SEAL 033700 ENGINEER ADRIAN S. DURHAM
01-04-2013

REVISIONS:

PROJECT: 2012.07.0010
DATE: JANUARY 4, 2013
DRAWN BY: GWVIII
CHECKED BY: ASD

FOUNDATION PLAN

S100

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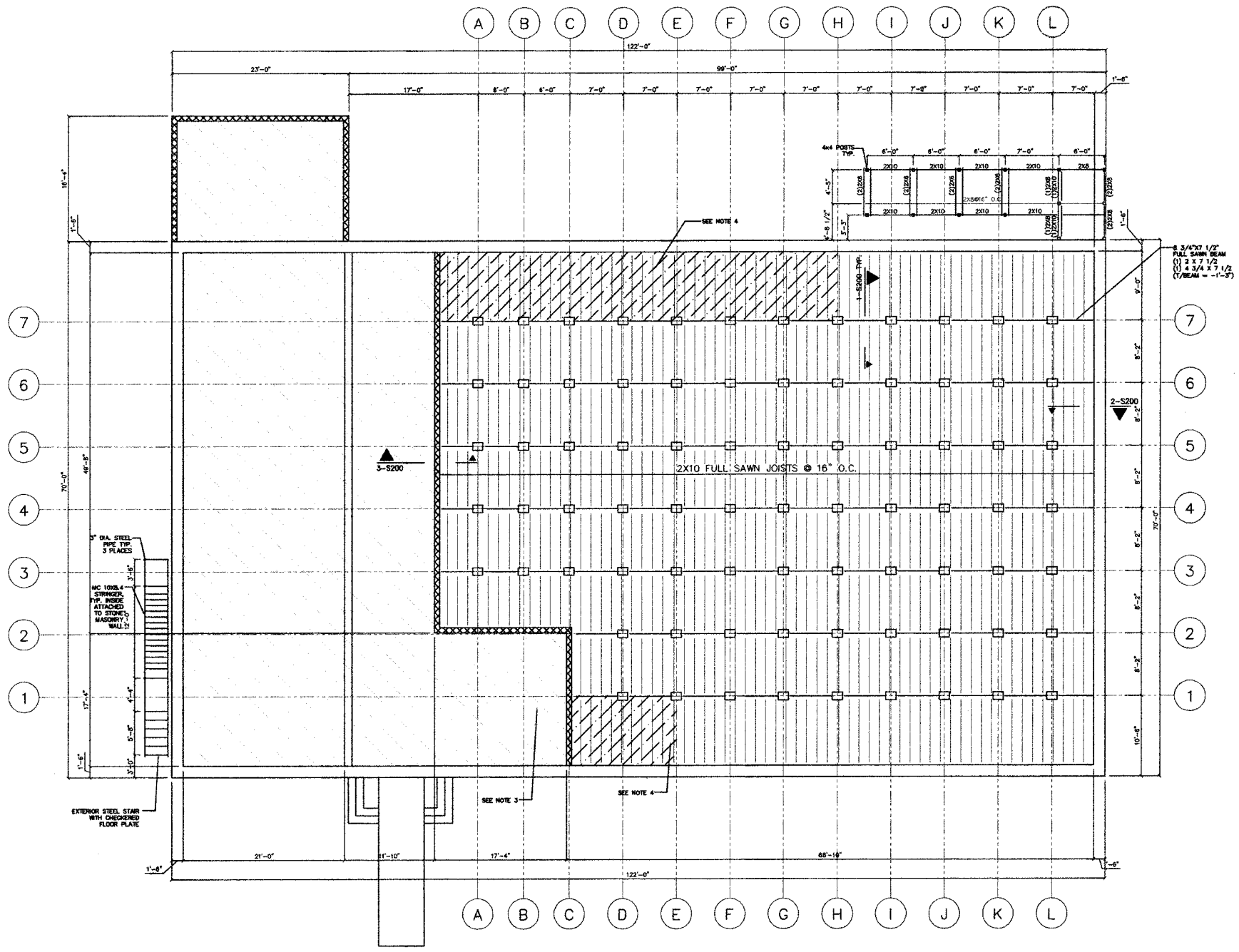
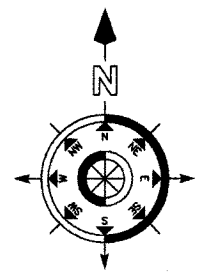


1ST FLOOR FRAMING PLAN

1/8"=1'-0"



1ST FLOOR FRAMING PLAN NOTES

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2. DATUM ELEVATION (+0'-0") = FINISHED FLOOR ELEVATION (FFE). ALL ELEVATIONS ARE REFERENCED FROM FFE.
3. AREA OF LIMITED STRUCTURAL SURVEY DUE TO INACCESSIBILITY OF STRUCTURAL MEMBERS.
4. AREA OF OBSERVED WOOD JOIST DETERIORATION/ ROT
5. FLOOR DECKING – 1"X6" DIAGONAL DECKING WITH 1" HARDWOOD SUBFLOOR AND 1" HARDWOOD FINISHED FLOOR
6. 1ST FLOOR FRAMING HAS BEEN RATED FOR 130 PSF TOTAL LOAD CAPACITY

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NORTH CAROLINA REGISTERED PROFESSIONAL CORPORATION FIRM NO. C-3406 STRUCTURAL CAPACITY, PC

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033700 01-04-2013 ENGINEER ADRIAN S. DURHAM

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CHECKED BY: ASD

1ST FLOOR FRAMING PLAN

S101

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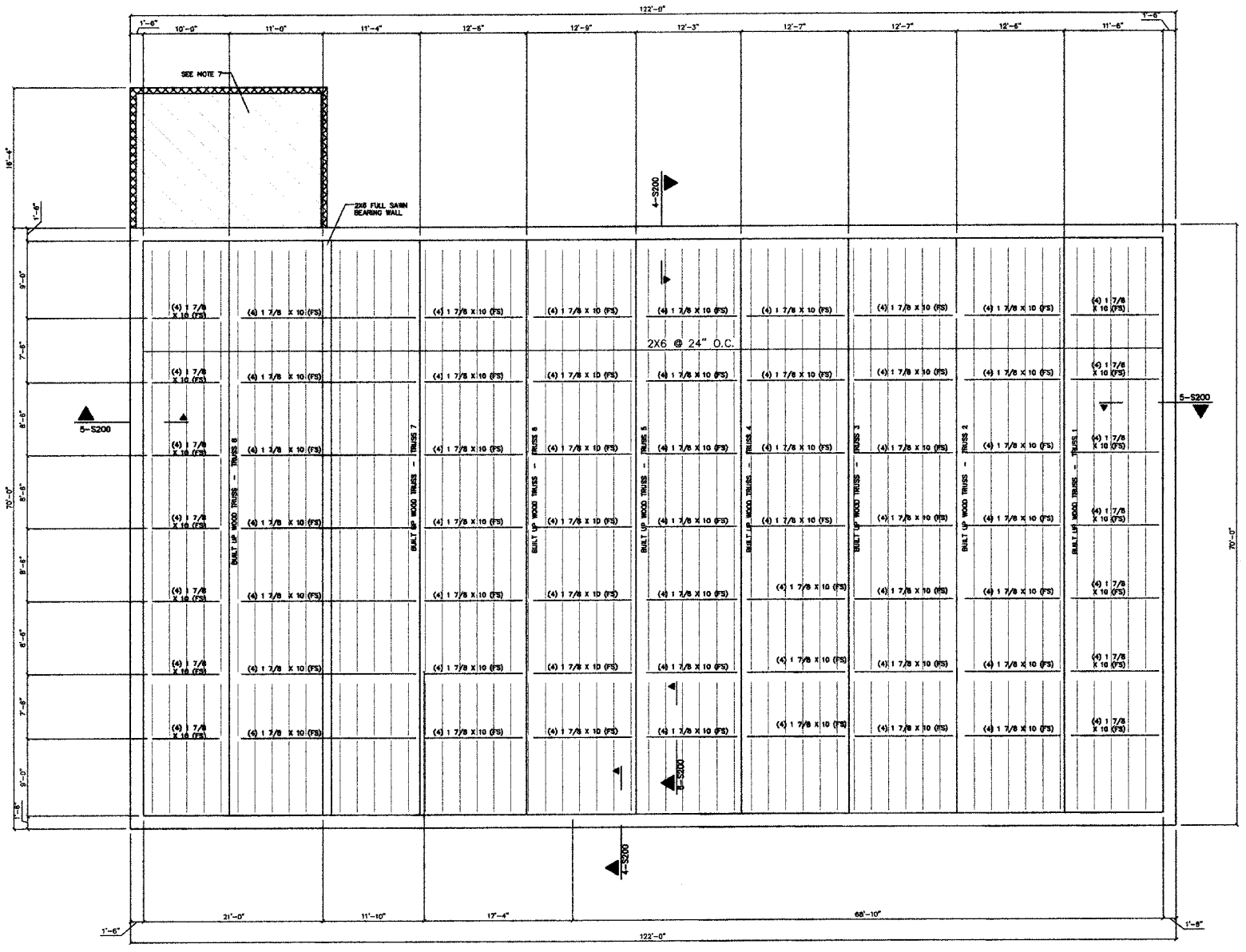
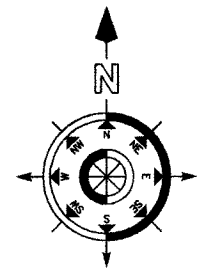


ROOF FRAMING PLAN

1/8"=1'-0"



FOUNDATION PLAN NOTES

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2. DATUM ELEVATION (+0'-0") = FINISHED FLOOR ELEVATION (FFE). ALL ELEVATIONS ARE REFERENCED FROM FFE.
3. TRUSS BEARING ELEVATION = (+17'-10 1/2")
4. F.S. = FULL SAWN LUMBER DIMENSIONS.
5. ROOF DECK IS 5 1/2" WIDE WOOD DECKING. DEPTH COULD NOT BE DETERMINED AT TIME OF STRUCTURAL SURVEY.
6. ROOF HAS BEEN RATED FOR 30 PSF TOTAL LOAD CAPACITY
7. AREA OF LIMITED STRUCTURAL SURVEY DUE TO INACCESSIBILITY OF STRUCTURAL MEMBERS.

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NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER SEAL CERT. NO. C-2408 STRUCTURAL CAPACITY, PC

NORTH CAROLINA PROFESSIONAL SEAL 033700 01-04-2013 ENGINEER ADRIAN S. DURHAM

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PROJECT: 2012.07.0010
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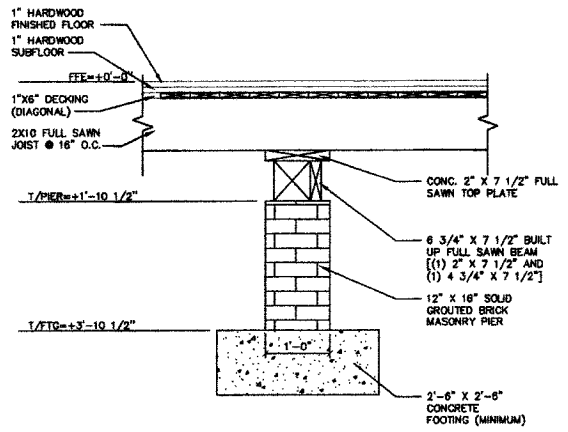
ROOF
FRAMING PLAN

S102



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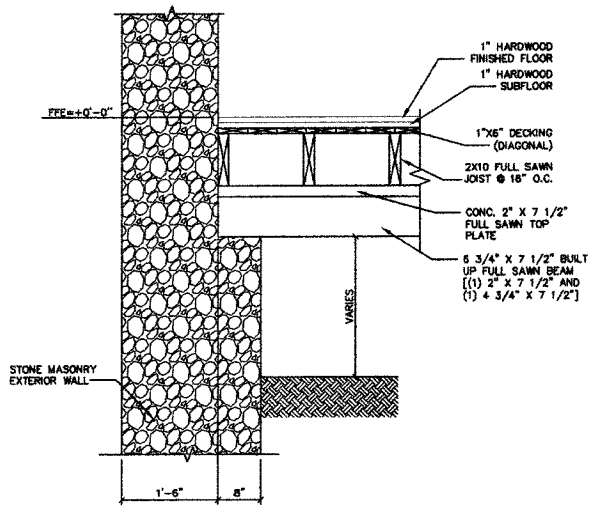

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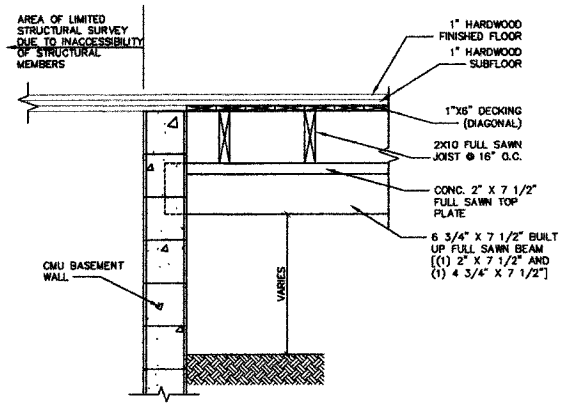

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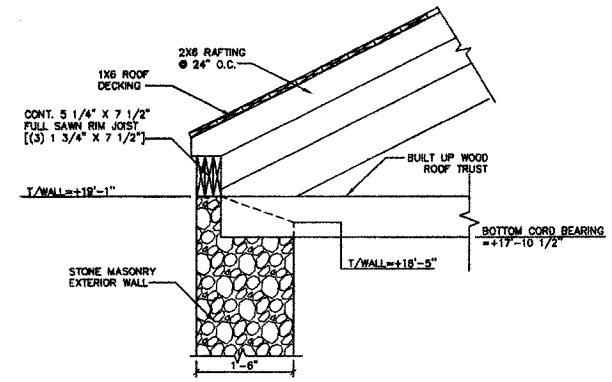

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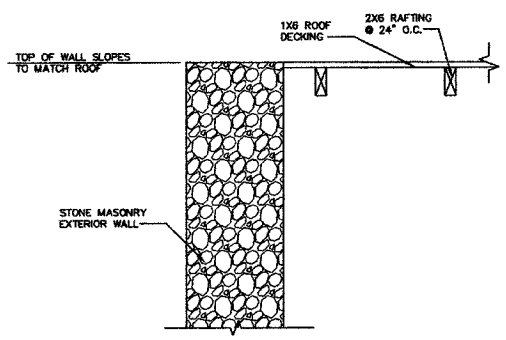

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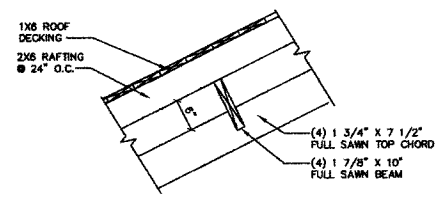

6 SECTION

3/4"=1'-0"

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NORTH CAROLINA PROFESSIONAL ENGINEERING CERT NO. C-3408 STRUCTURAL CAPACITY, PC

NORTH CAROLINA PROFESSIONAL SEAL 033700 01-04-2013 ENGINEER ADRIAN S. DURHAM

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DETAILS

S200

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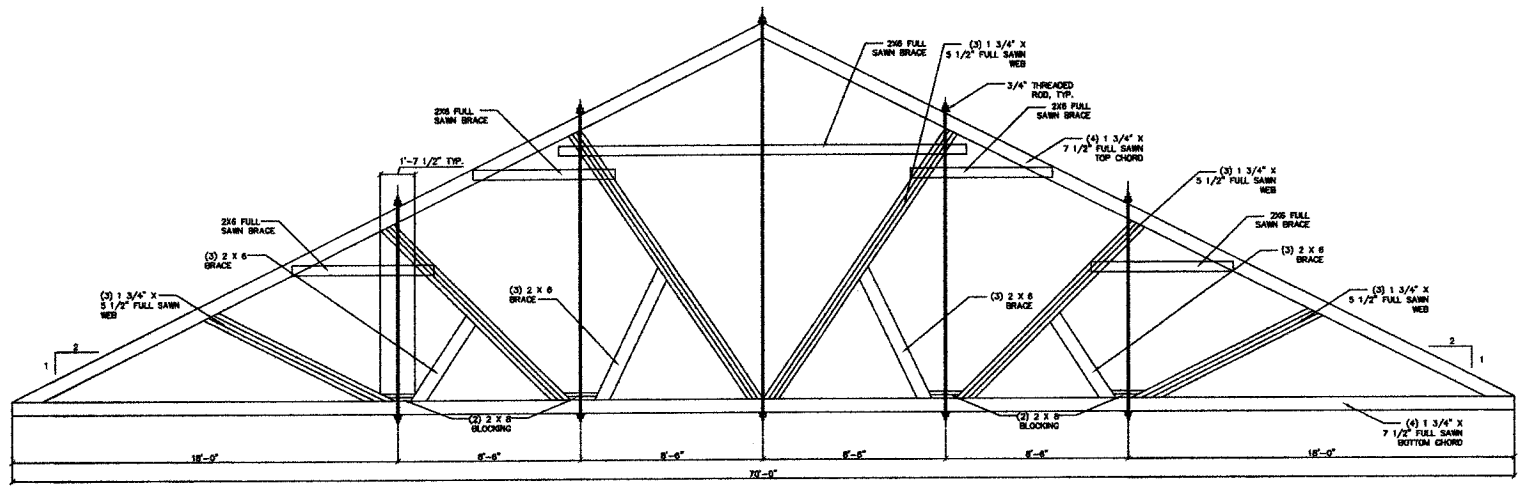

1 TYPICAL TRUSS ELEVATION

1/4"=1'-0"

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(FIRM) NO. C-3468

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