



OFFICE OF MAINTENANCE AND OPERATIONS

DATE: January 16, 2014

TO: Karen Gagliano, Director of Business and Support Services

FROM: Allen Thacker, Supervisor of Maintenance and Operations

SUBJECT: Blankenship Visitor Bleachers

Karen,

I am enclosing a copy of the Annual Bleacher Inspection Report for Blankenship Field/Jack Armstrong Stadium. The report indicates that the visitor side bleachers are no longer safe for occupancy and the cost of corrective action is prohibitive. The report goes on to recommend the replacement of the visitor bleachers because they pose too great of a liability risk if they are to remain in service. In addition to the bleachers, the main stairs from the dressing rooms to the field level on the home side were noted for serious age and erosion conditions. This information was presented by the architectural firm, ACHW, in a meeting with Dr. Borchers, Karen Gagliano, and me.

The scheduled Planning Commission meeting on CIP was just a few days away and with the high priority of this item, it was decided that we would include it in our presentation. The planning commission was very receptive to the information provided and they included a recommendation to move the funding request for replacement of the Blankenship bleachers from fiscal year 2017 to fiscal year 2015. The city council will meet in a work session on January 27th to discuss the recommendation of the Planning Commission.

Due to the short time frame needed for construction of new bleachers I am recommending that the Board of Education approve the immediate demolition of the current visitor side structure by the Maintenance and Operations Department. All of the steel and aluminum will be salvaged for recycling and the funds can be used for any additional repairs or renovations required at the site. In talks with two different bleacher contractors, the construction of a 2,000 seat grandstand will require between 120 and 150 days. This does not include site preparation and rebuilding of the retaining wall under the bleachers. This puts our drop dead start date to be no later than May 1st with a preferred start date of April 1st. By directing Maintenance and Operations to begin the demolition, we will immediately remove our liability and get a head start on reconstruction.

Thank you,

Allen Thacker,

Supervisor of Maintenance and Operations

ACHW

■ ADAMS CRAFT HERZ WALKER ARCHITECTS • ENGINEERS • PLANNERS • SURVEYORS ■

November 1, 2013

Allen Thacker, Supervisor of Maintenance
Oak Ridge Schools
P.O. Box 6677
Oak Ridge, TN

Dear Allen:

We were asked to evaluate the bleachers at Blankenship Field in terms of structural soundness, life safety issues, and ADA compliance.

A major guideline is the ICC 300-2012 Standard for Bleachers Folding and Telescoping Seating and Grandstands, which is a subset of the 2012 International Building Code.

Unlike many other building elements, existing grandstands are not subject to being "grandfathered". They are obligated to meet all requirements as if it was new construction.

The reports prepared by Master Craft Bleachers and our structural engineer, Carpenter Wright, independently come to the same conclusion:

1. There are serious structural problems with the visitors' grandstand that might be able to be remedied at significant expense but still would not be able to accommodate the additional loads that would be superimposed once life safety remedies (particularly enclosing the open spaces under the bleacher seats) were made.
2. The home bleachers minimally require cleaning and protection of the steel structure and replacing of all guardrails and hand rails. Enclosure of the area under the seating is probably not required as it would be on the visitor's side because the ground under the bleachers follows the slope of the stands and is less than two (2) feet.

The question of ADA access for the visitors bleachers is moot considering the conditions mentioned above. Nominally 1% of seating needs to be handicapped accessible.

As we see it there are a number of components that need to be addressed. We have listed them below with a ballpark estimate of construction cost.

1. Replacement of the visitors bleachers (present capacity 3,400)
 - a. If 3,000 capacity is desired - \$450,000
 - b. If 2,000 capacity is adequate - \$350,000

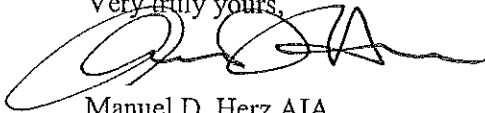
Note: If the smaller capacity bleacher is considered adequate, it allows us to develop a small parking lot for handicapped which presently does not exist.

2. Home Bleachers - life safety & structural improvements
 - a. Fencing, aisle steps, aisle rails - \$25,000
 - b. Cleaning & protection of steel - \$50,000
addressing concrete block wall repairs
 - c. The Wildcat Stairs as outlined in the accompanying report will also need to be addressed

3. If the above recommendations are followed handicapped seating will be incorporated in the new bleachers, but the handicapped parking is still a challenge. We feel that the paved area outside the gate on the visitors side can be enlarged to accommodate about seven vehicles, an improvement but still short of the 1% of seating capacity which is required for handicapped parking.

The following pages address our findings in more detail. We will welcome discussing these issues with you.

Very truly yours,



Manuel D. Herz AIA



MasterCraft
We Seat Champions

INSPECTION REPORT

Facility Name: Oak Ridge High School

Date: 10/08/2013

Facility Contact: Manny Herz

Inspection By: Lee Kiesler

Facility Address: 1450 Oak Ridge Turnpike

City: Oak Ridge State: TN Zip: 37830

Bleachers (INDOOR/OUTDOOR)

	N/A	GOOD	FAIR	POOR	COMPLIANT	COMMENTS
1. ICC-300: 503.3 Required Guards < 4"				X		Home Side
2. ICC-300: 311.1 Open Spaces < 4"				X		Home Lower/Visitors
3. ICC-300: 404.1 Min. # of Exits 0-250=1				X		Home/Visitors
4. ICC-300: 405.2 Aisles 48"				X		Home/Visitors
5. ICC-300: 409.4-5-6 Handrails				X		Home/Visitors
6. Power System Rollers/Chain Drives	X					
7. Seats/Seat Modules/End Caps	X					
8. Row Locks	X					
9. Cantilever Lift (in open position)	X					
10. Cantilever Stops	X					
11. Deck Supports	X					
12. Welded Connections				X		Home/Visitor Understructure.
13. Brake Pads/Arms (manual bleachers)	X					
14. Lift Board Hinges (manual bleachers)	X					
15. Board Condition (wood only)	X					

SPECIAL NOTES:

Please note that MasterCraft does not recommend the use of these bleachers and also believes it is a major liability for the customer to do so. MasterCraft strongly urges the customer to move any and all events that may be scheduled at this stadium to be moved immediately.

In our opinion these bleachers have more deficiencies on the understructure than the superstructure. We recommend that these bleachers be inspected by a structural engineer as well as a State or Local official for compliance.

Important Terms of This Inspection

ABOVE is an inspection provided by MasterCraft Renovation Systems LLC for said customer. The inspection is based solely on MRS interpretation of the ICC, NFPA and ADA codes. This inspection does not include local code assessments per site. The objective of this report is to provide the customer with an understanding of the general state of their facilities as listed above based on those interpretations. This report is completely visual and provides no hands on maintenance or repair to any equipment on said site. This report does not serve as a preventative maintenance agreement. This report does not include permits and/or licenses, ENGINEERED DRAWINGS, STATE APPROVAL, LOCAL CODE COMPLIANCE, OR ANY OTHER EXTRANEIOUS FEES. The information herein is intended exclusively for the use of the customer and shall not be disclosed to any third party without the express written consent of MasterCraft Renovation Systems, LLC. In consideration for the submittal of this proposal the customer agrees that the information disclosed herein is proprietary and in the event of a breach of these terms, MasterCraft Renovation Systems, LLC shall be entitled to injunctive relief as a cumulative and not necessarily or exclusive remedy to claim for monetary damages.

Customer Initials: _____

November 1, 2013

Mr. Manny Herz
Adams Craft Herz Walker
800 Oak Ridge Turnpike, Suite A400
Oak Ridge, TN 37830

**Re: Bleacher Framing Review
Blankenship Field/Jack Armstrong Stadium
Oak Ridge Schools
Oak Ridge, Tennessee
CWE Project No. 2013187.00**

Dear Manny:

As requested, we have observed the above referenced facility in order to review the structural condition of the framing for the bleacher systems. This report documents our observations and summarizes our preliminary findings. An exhaustive structural analysis of the bleacher system has not been performed.

This review does not include geometrical considerations such as allowable open areas in seating areas, guardrail system dimensional criteria, and accessibility. Those items will be addressed as part of the ACHW evaluation. However, we have attempted to consider some implications for the upgrade of those systems and their effect on the existing support framing.

General Description

We visited the site on October 14, 2013. Refer to the General Arrangement Sketch S1 attached for the layout of bleachers and of elements to be discussed. The Visitor's area bleachers are on the East side of Blankenship field and are comprised entirely of an elevated system. The system consists of aluminum footboards and seatboards supported by painted steel framing. It is our understanding the system has been adapted at some point from a wood seatboard and footboard system supported by the existing steel framing. Refer to Photo 1 for an overall view of Visitor's side and Photos 2 & 3 for typical support framing. The Home area bleachers are on the West side of the field and include two distinctly different seating systems. The lower level is similar to Visitor's area in that it has aluminum footboards and seatboards supported by painted steel framing. However, the grade slopes upward with the tiered seating. See Photo 17 for a

typical condition. The distance between footboards and grade is relatively consistent and is much less than that for the Visitor's side. The upper level Home area seating consists of aluminum seatboards mounted to a stepped concrete-on-grade structure. The grade slopes with the seating and it is not an elevated system. See Photo 15 for the concrete supported system.

Structural Observations

Our observations with applicable comments are as follows:

1. The steel support framing for bleachers (both Visitor's side & Home lower level) is corroding. All steel framing and railing needs to be properly cleaned and painted.
2. Posts for the handrail/guardrail systems throughout the facility are spaced such that the horizontal rails are inadequate for current prescribed loads for new structures.
3. Previously repaired pedestals supporting bleachers were observed to be cracked. It is noted that the repairs differ from that of the specified details and the cracking appears only to be in the plain concrete encasement above the base plate. Refer to Photos 6 and 7 for this condition.
4. On the Visitor's side, many of the vertical supports appear to be out-of-plumb. There is apparent horizontal sweep in the stringers and seatboards.
5. Scouring and erosion of concrete stairs and surrounding grade was observed at the Visitor's restroom (See Photo 13).
6. Scouring and erosion of concrete stairs and surrounding grade was observed at "Wildcat Crossing Stair" (Refer to Photo 25). Spalled concrete, exposed reinforcement, and deteriorated concrete was found at Wildcat stair (See Photo 26).
7. Deterioration of the CMU foundation walls at the Home stands was observed (Photos 22 & 23).
8. Cracked/spalled concrete was observed at the handrail connections at aisles of the Home side metal bleachers (Photo 21).

Review of Building Code for Structural Provisions

The 2012 International Building Code (IBC) as enforced by the city of Oak Ridge dictates design loads for new bleachers and references the "ICC 300-2012 Standard for Bleachers, Folding and Telescopic Seating, and Grandstands". Refer to Appendix A1.1 thru A1.5 attached for applicable pages of the IBC.

The ICC 300 is applicable to both new construction and existing bleachers. The requirements for existing bleachers are primarily contained in Chapter 5 of the standard. See Appendix B1.1 attached for structural considerations of existing bleachers. All existing tiered seating shall be inspected annually per section 501.2. Section 502.1 states that existing tiered seating shall be maintained "structurally sound". This section also defines the term structurally sound.

Section 501.4 requires that alterations to tiered seating conform to the requirements for new construction. If alterations affect portions of structures, those portions must comply with provisions for a new structure. These provisions require the consideration of specified horizontal sway loads (Refer to B1.2 attached) for which the existing bleachers were certainly not designed. We have elaborated further regarding this requirement below.

Renovation Considerations

1. Modification of existing guardrail/handrail system to achieve extended heights would necessitate replacement of the rail systems.
2. If new solid elements are added to alleviate current open conditions in the elevated systems, dead loads and wind loads would be increased for the existing framing system. Further, the provisions of ICC 300 would require the specified loads for new construction be considered. Subjected to these increased loads, the existing framing would be inadequate. It is judged that it would be impractical to retrofit and upgrade the structural framing system as essentially all structural members would be affected.
3. The concrete at the Wildcat Stair is in poor condition. The erosion and scouring at the stair needs to be addressed. The handrails for this stair do not comply with structural load provisions for new construction.

Structural Recommendations

The steel framed support systems for the bleachers have served well for many years. However, we believe the framing is nearing the end of its useful life. To upgrade the seating and guard systems to comply with modern life-safety provisions would require retrofit or reinforcement of the framing systems. A retrofit of the steel framing would be very difficult in that nearly all members would require some modification or strengthening. We recommend that the elevated framed systems be replaced.

The concrete at the Wildcat stair needs to be repaired or replaced. The handrail system for the stair should be replaced.

Bleacher Framing Review – Blankenship Field
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November 1, 2013

We are available for any questions or comments.

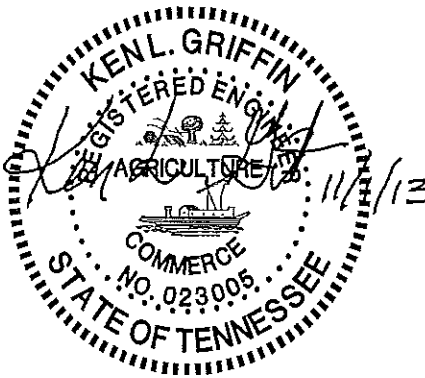
Sincerely,
CARPENTER WRIGHT ENGINEERS, P.L.L.C.



Christopher A. Myers, P.E.

Ken L. Griffin, P.E.
Principal

attachments



Bleacher Framing Review – Blankenship Field
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Photo 1: Visitor's (East Side) Metal Bleachers – View Looking East

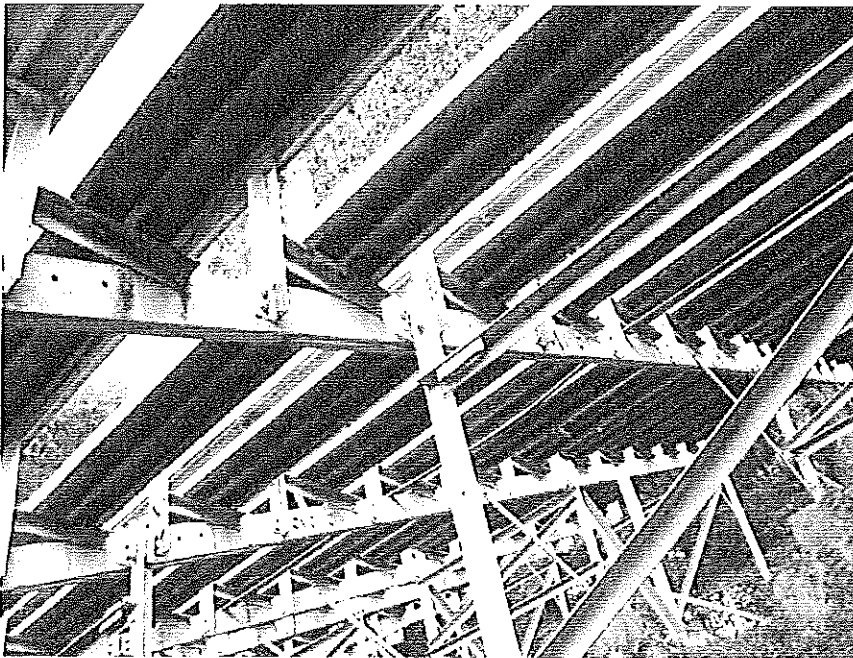


Photo 2: Visitor's Bleacher (East) – Stingers & Seating Connections

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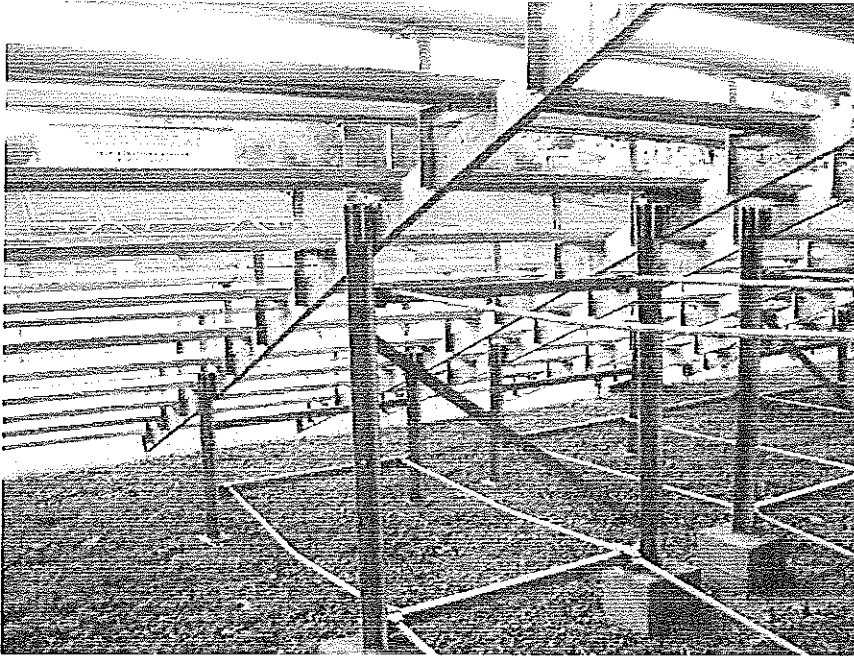


Photo 3: Visitor's Bleacher Framing

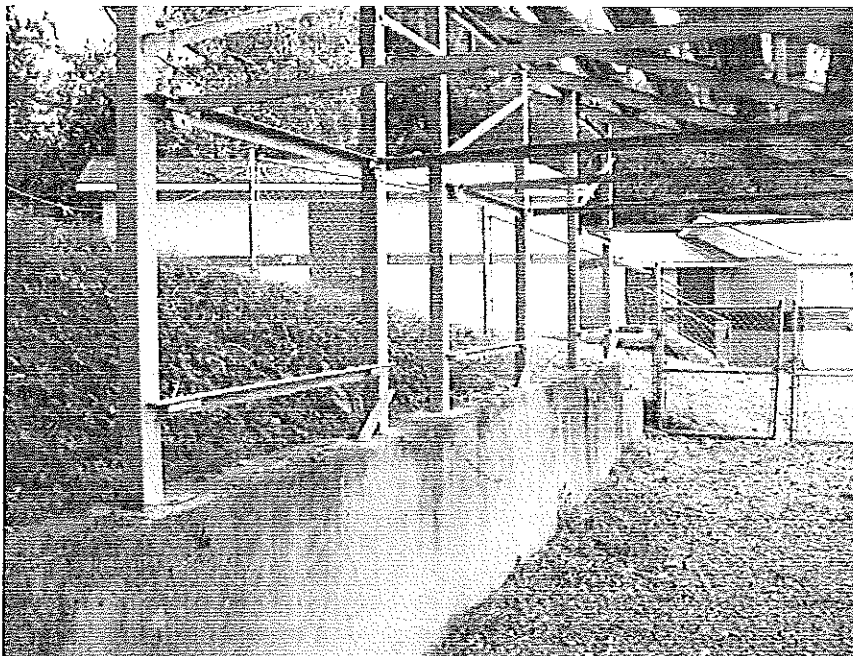


Photo 4: Visitor's Bleacher Framing – Bearing on Retaining Wall

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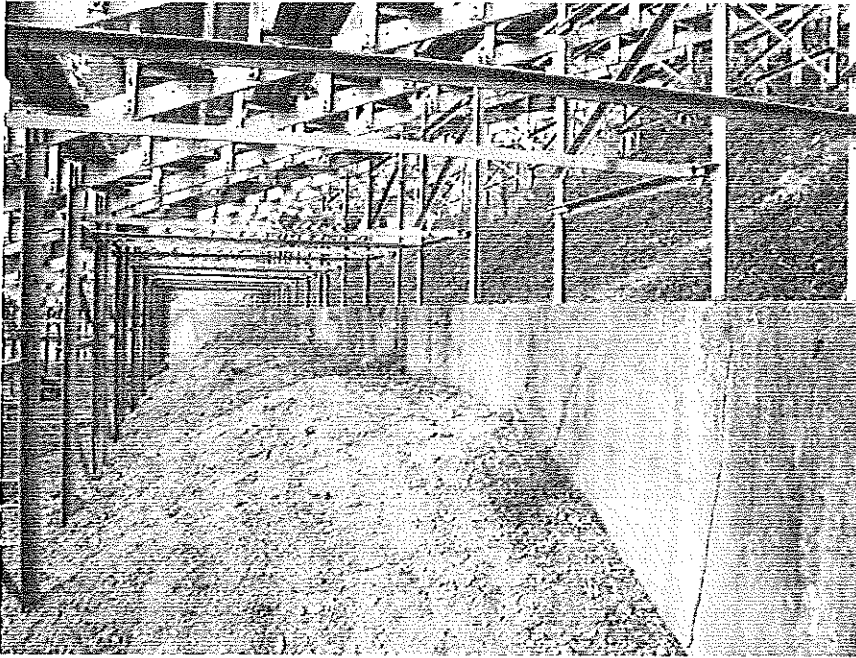


Photo 5: Visitor's Bleacher Framing – Looking North at Fill Previously Placed in Front of Retaining Wall

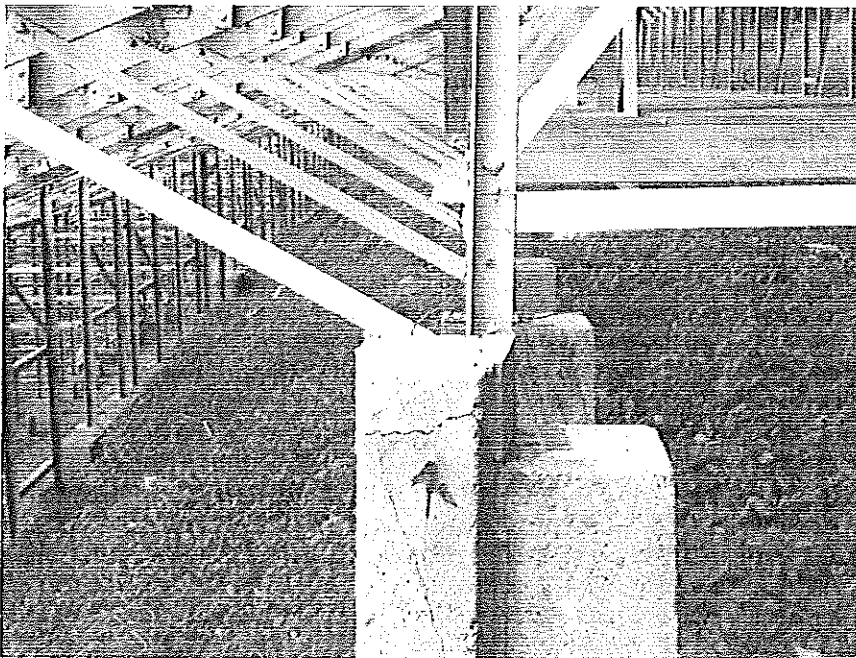


Photo 6: Visitor's Bleacher – Concrete Cracking at Previous Pedestal Repair

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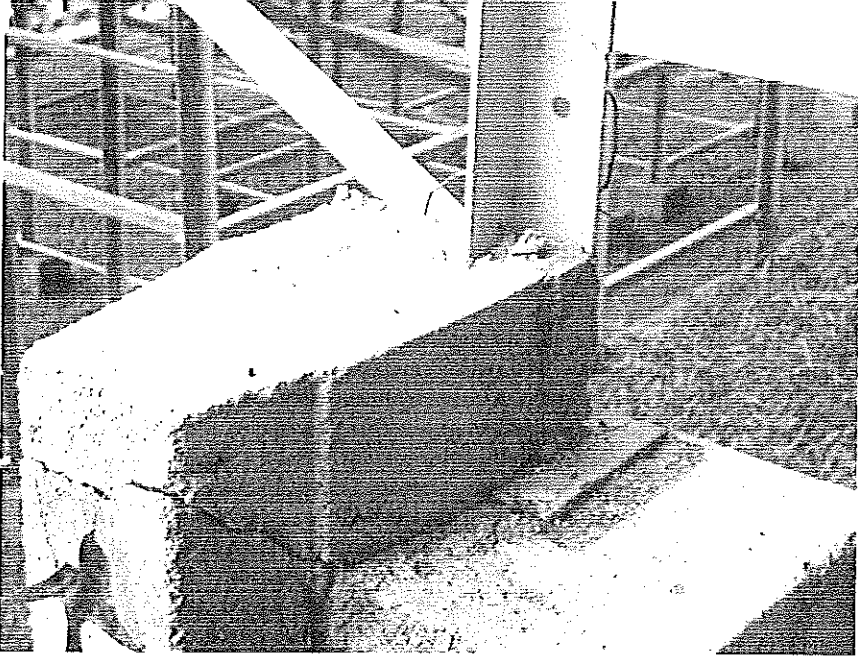


Photo 7: Visitor's Bleacher – Concrete Cracking at Previous Pedestal Repair

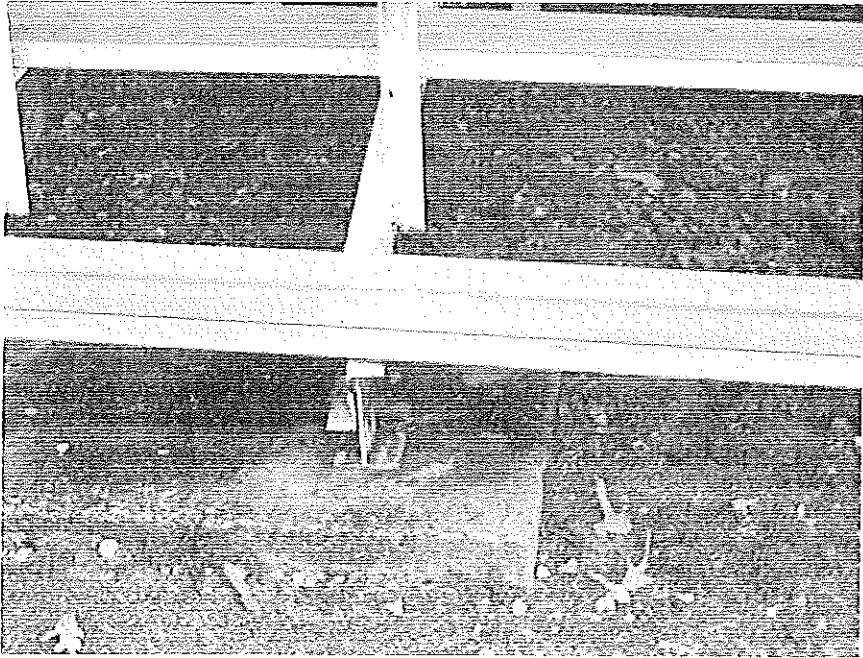


Photo 8: Visitor's Bleacher – Stringer Bearing Condition

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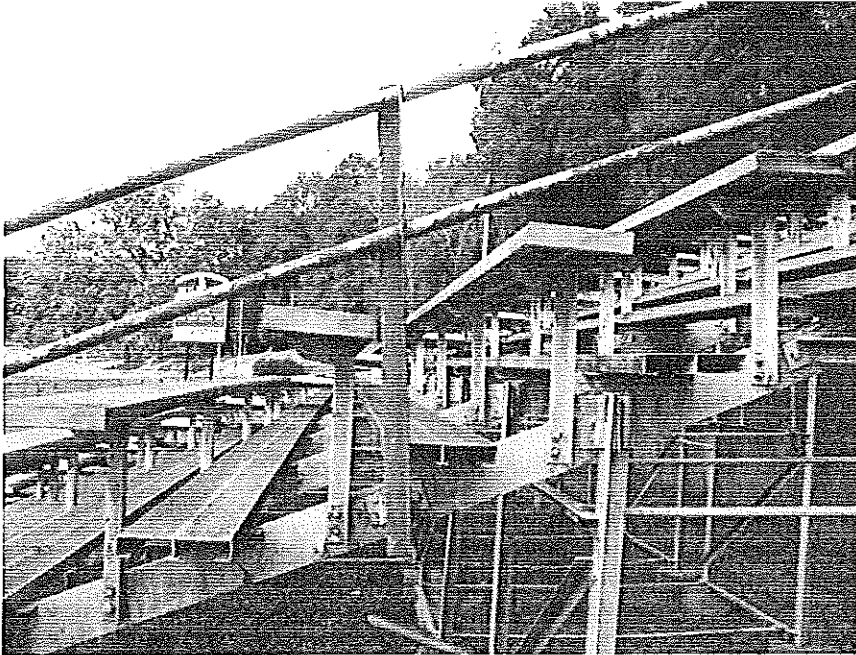


Photo 9: Visitor's Bleacher – Side Guardrail Condition

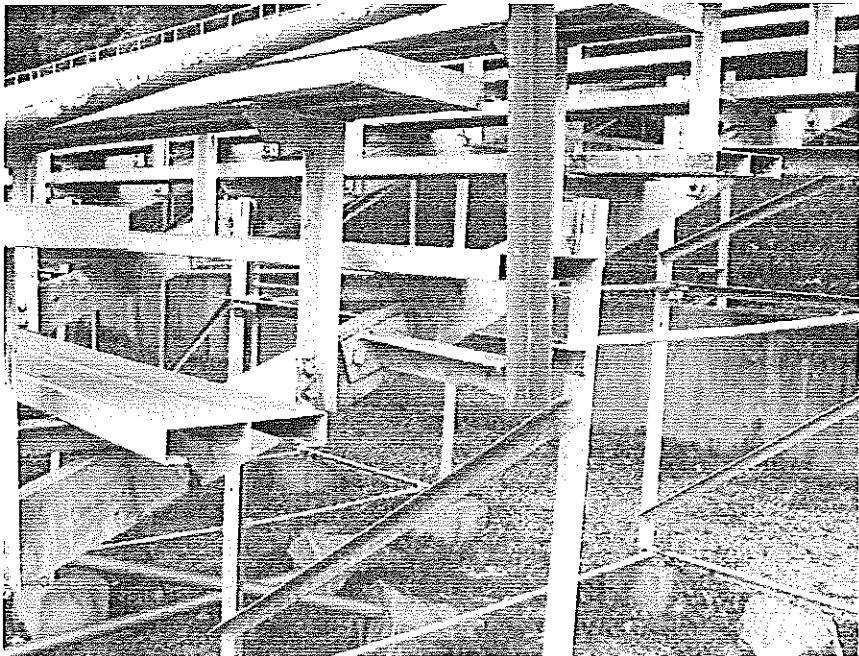


Photo 10: Visitor's Bleachers – Side Guardrail

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Photo 13: Erosion/Scouring at Stair on Grade – Visitor's Restroom

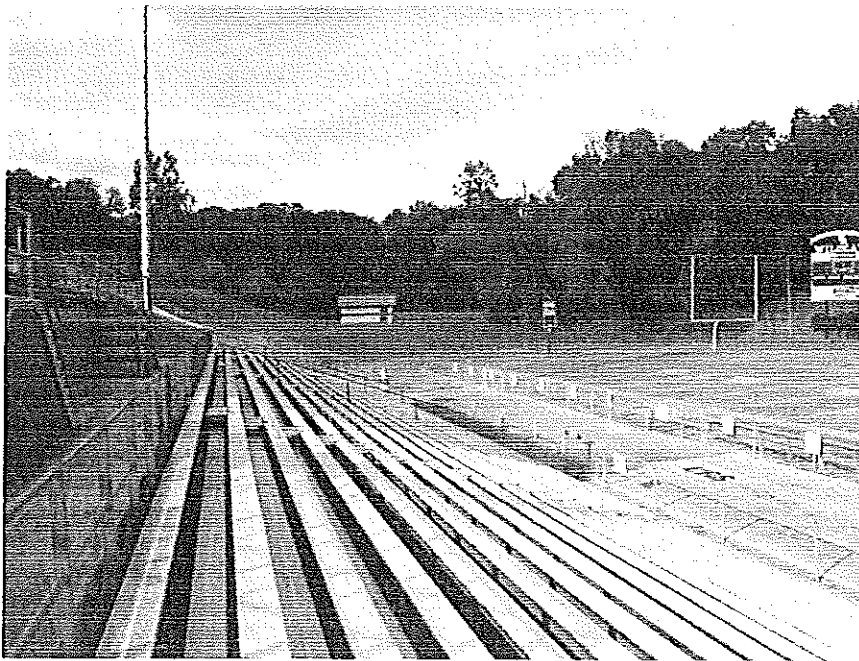


Photo 14: Home Side (West) - Metal Framed Bleacher Area

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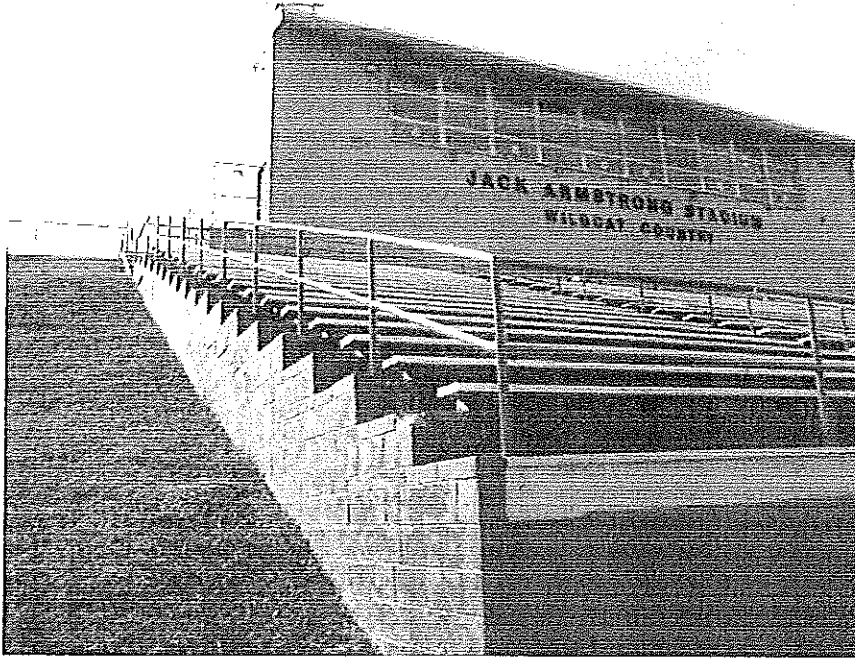


Photo 15: Home Bleachers – Concrete on Grade Area

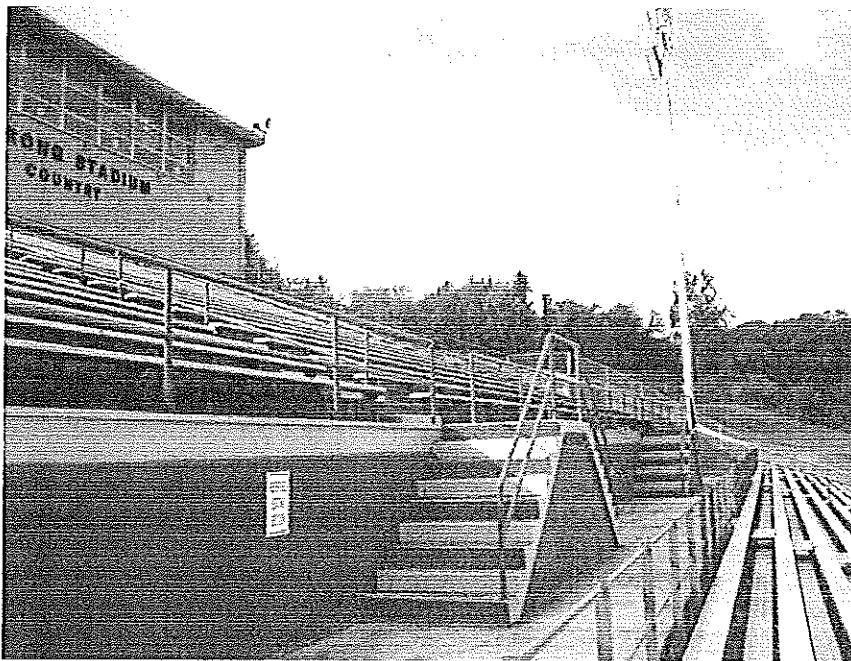


Photo 16: Home Bleachers – Concrete on Grade Area

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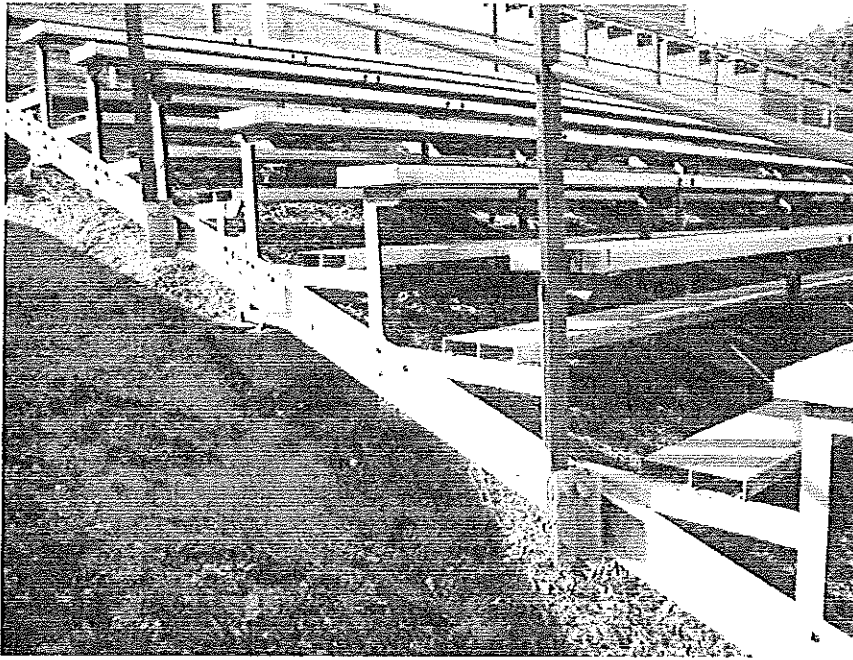


Photo 17: Home Side Metal Bleacher Area – Typical Framing

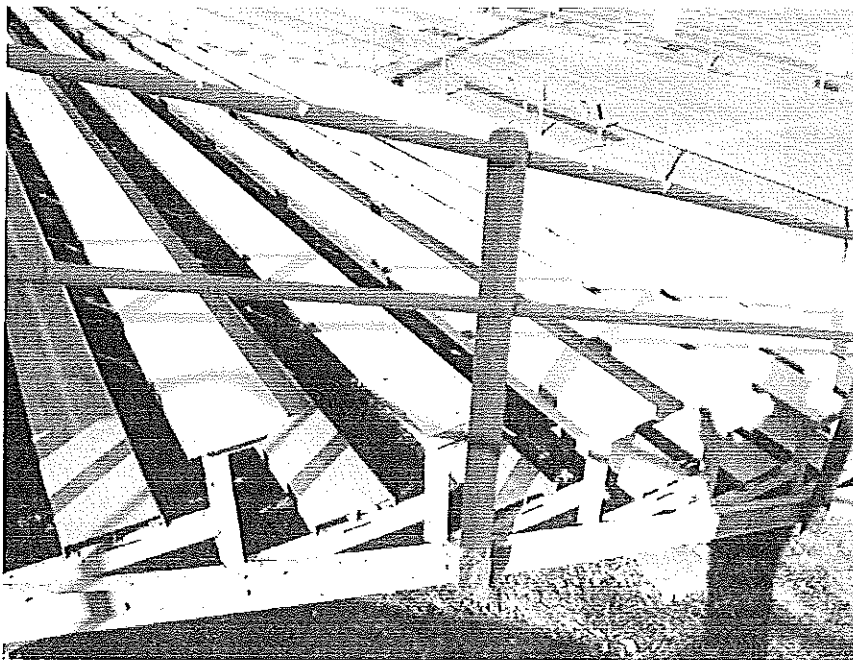


Photo 18: Home Side Metal Bleachers – Handrail Condition

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Photo 21: Home Side Metal Bleachers – Cracked/Spalled Concrete at Handrail Connection

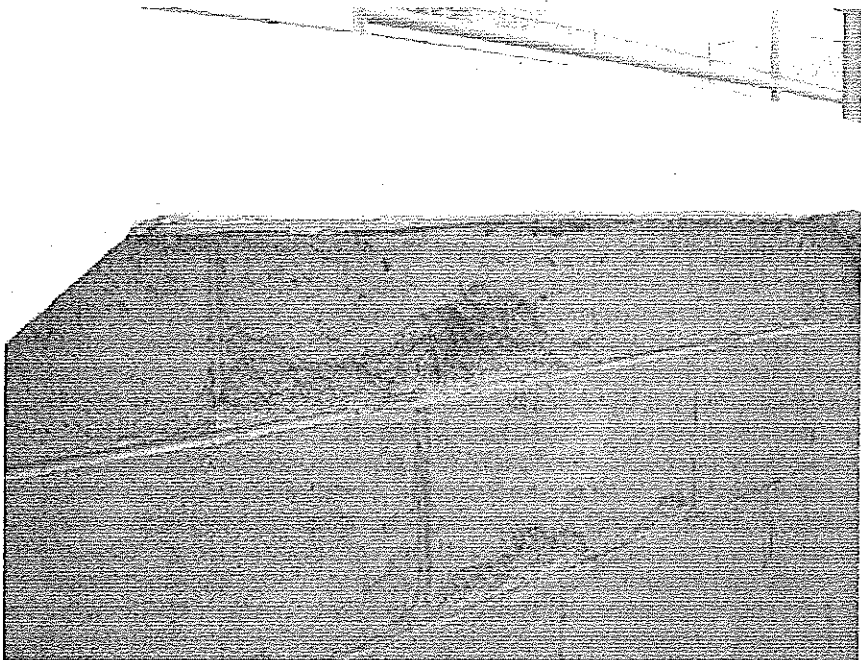


Photo 22: Home Side Stands – Deterioration at CMU Foundation Wall

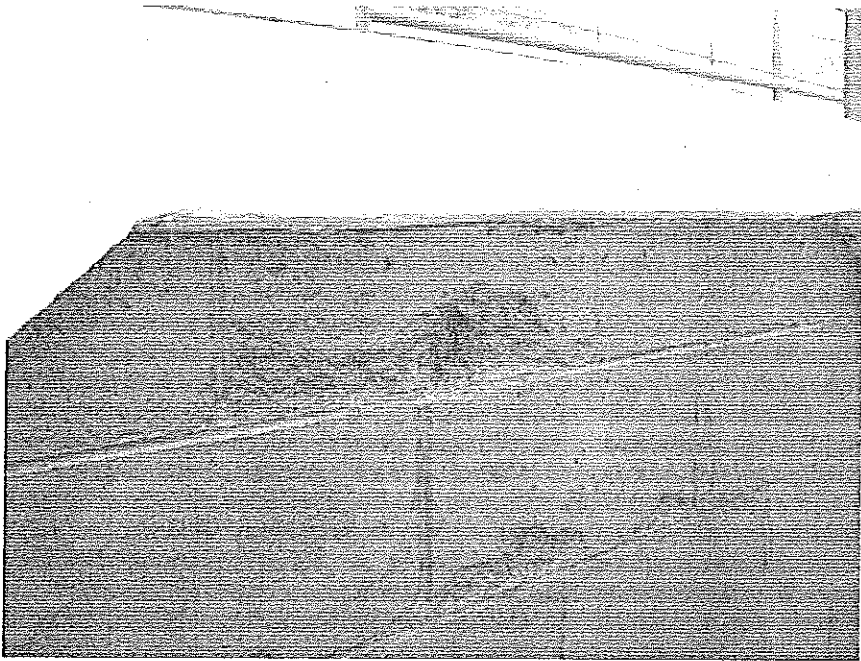


Photo 23: Home Side – Deterioration at CMU Foundation Wall

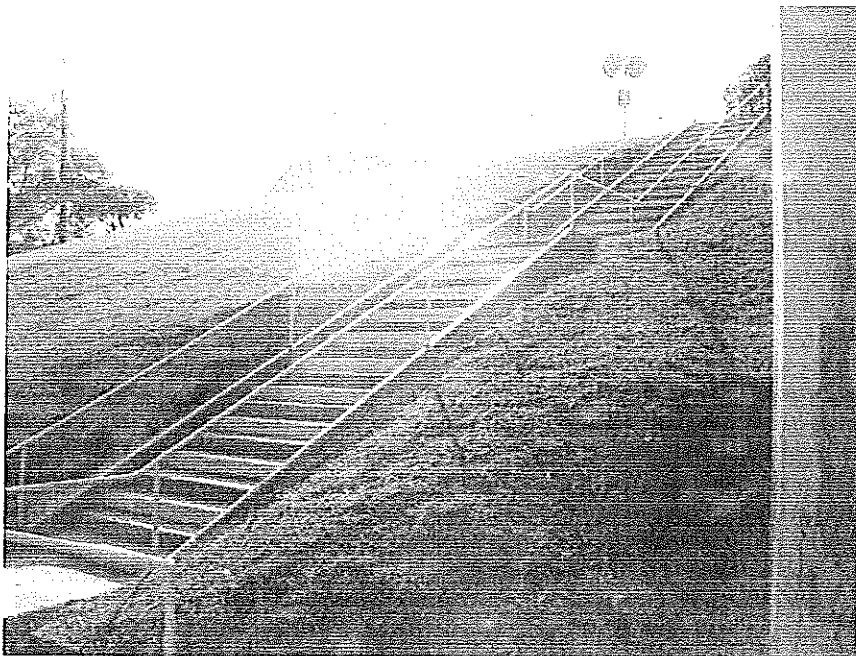


Photo 24: Wildcat Crossing Stair on Grade

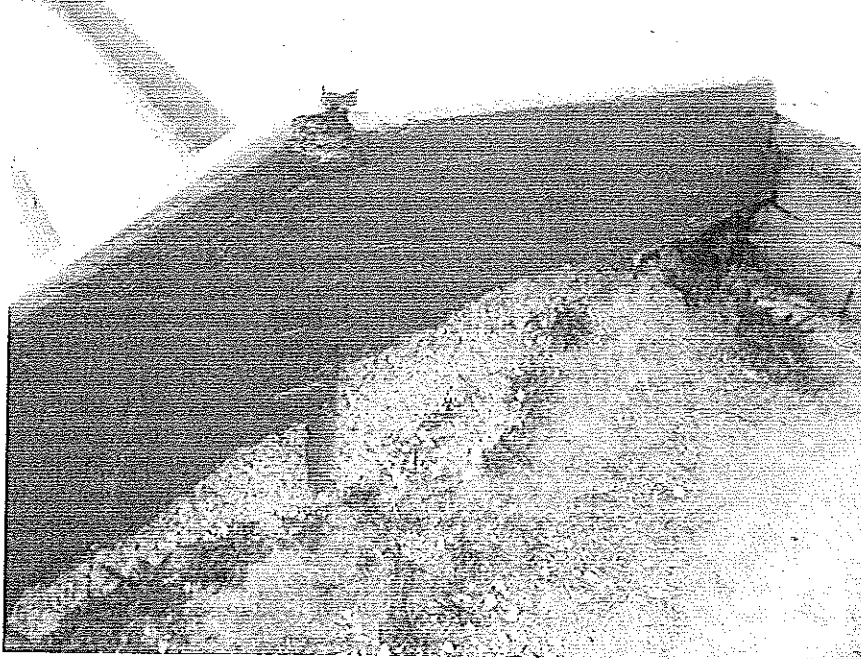


Photo 25: Wildcat Stair – Erosion/Scouring

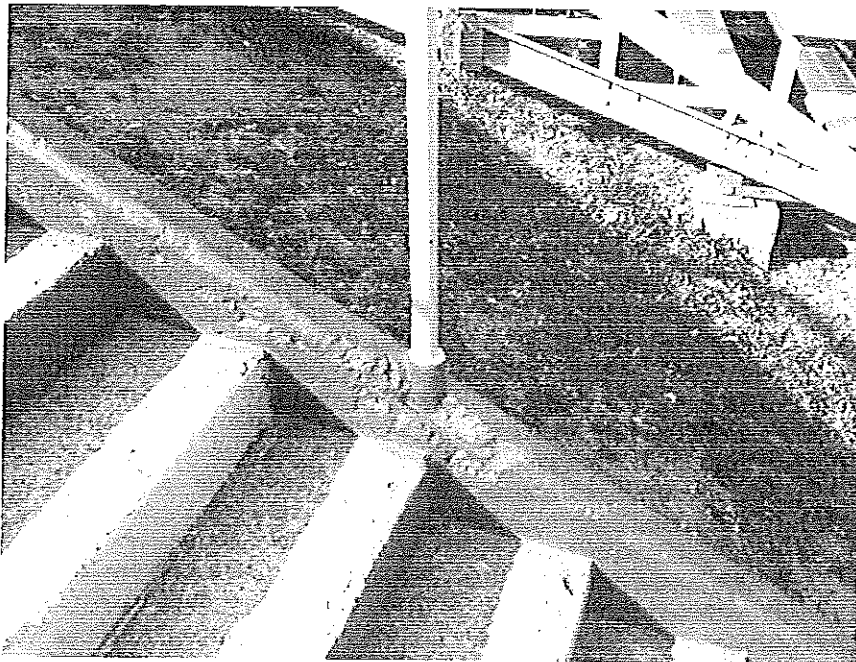
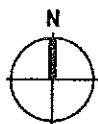
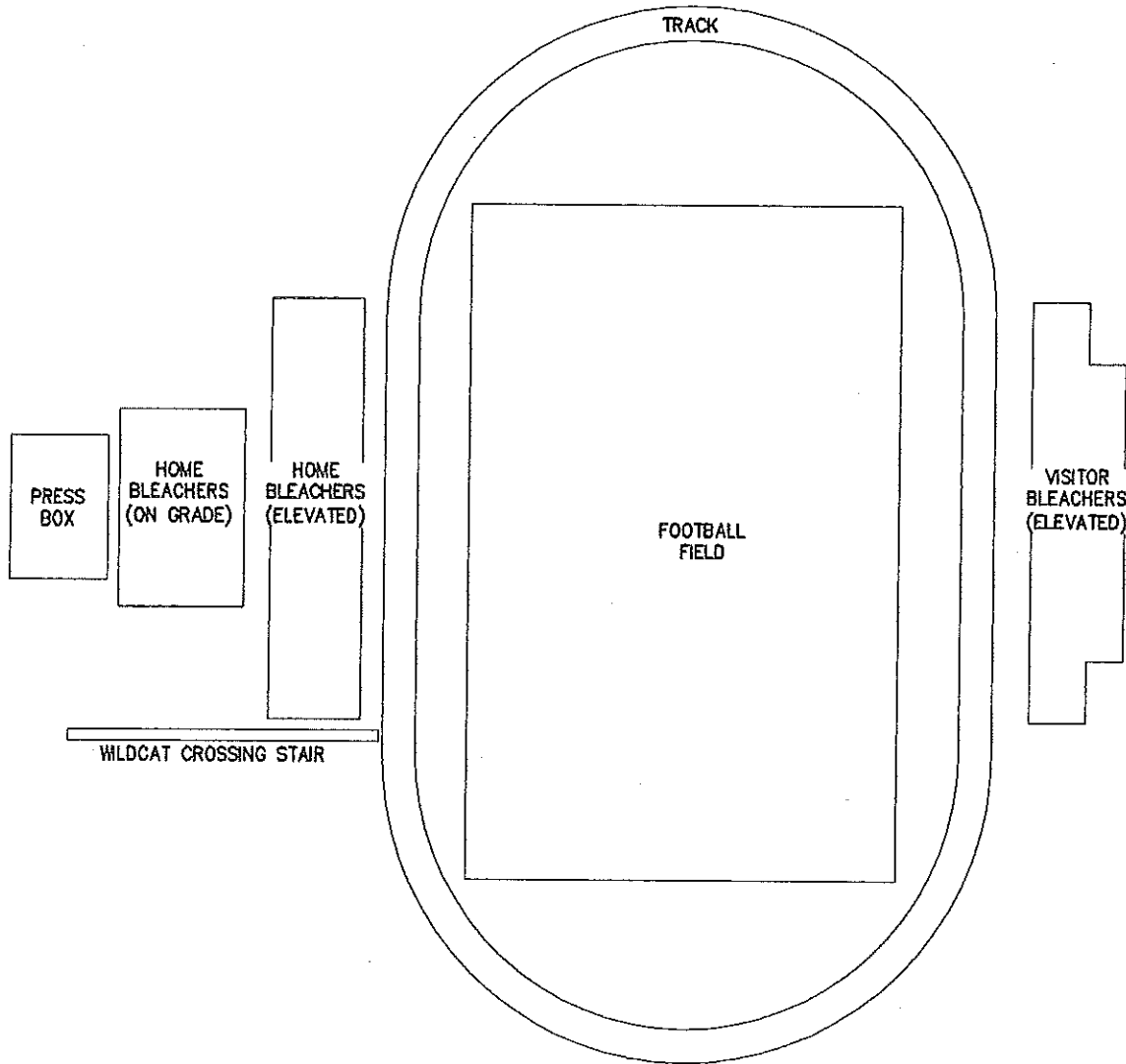



Photo 26: Wildcat Stair – Concrete Spalling/Exposed Rebar

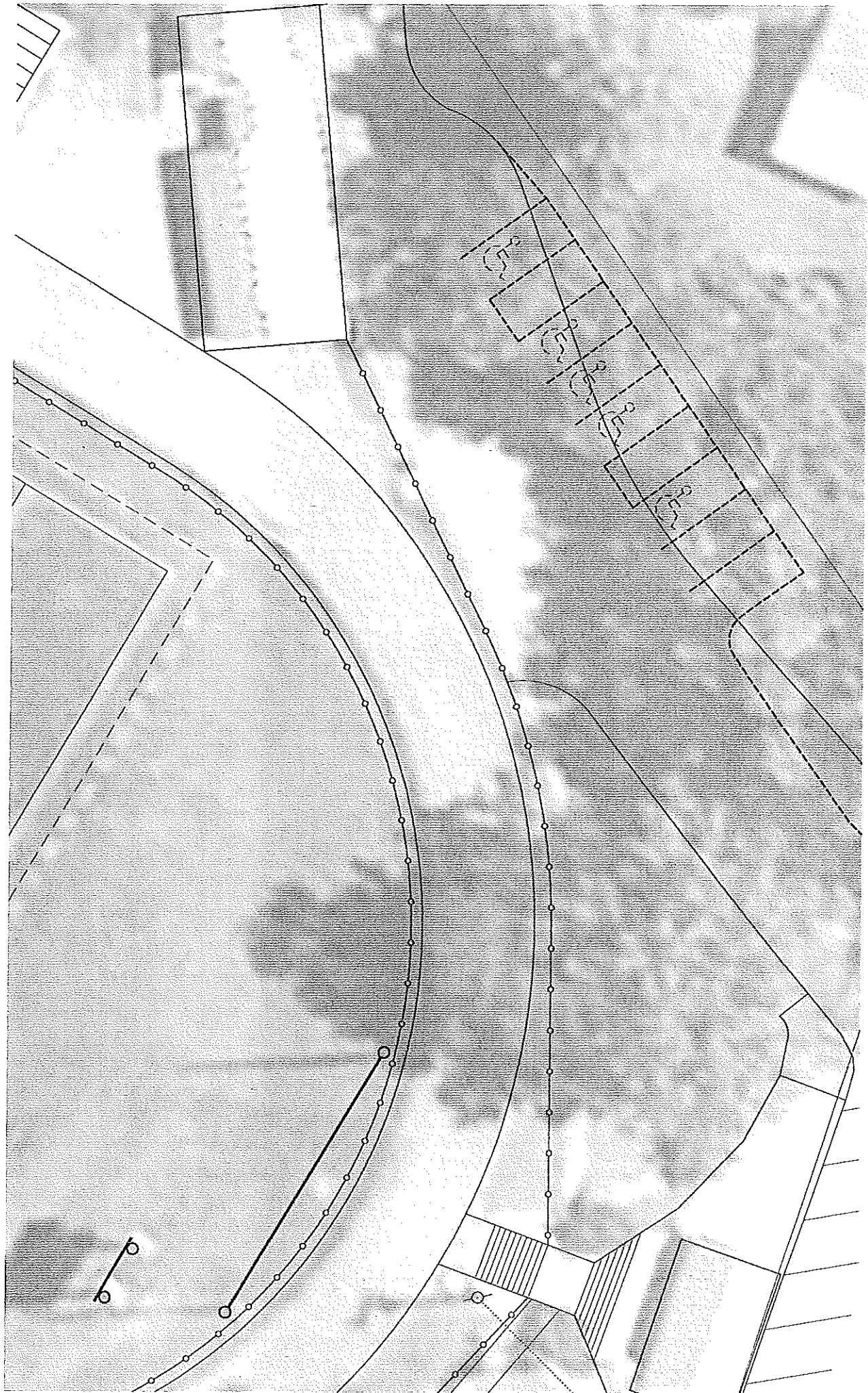


Photo 27: Wildcat Stair – Long Span between Handrail Posts



BLANKENSHIP FIELD/JACK ARMSTRONG STADIUM
 NOT TO SCALE

Carpenter Wright Engineers  Structural Consultants	PROJECT: BLEACHER FRAMING REVIEW BLANKENSHIP FIELD/JACK ARMSTRONG STADIUM OAK RIDGE, TN	DATE: 10-25-2013
	GENERAL ARRANGEMENT	CWE PROJECT #: 2013187.00
		SHEET #: SI



SECTION 1028 ASSEMBLY

1028.1 General. A room or space used for assembly purposes which contains seats, tables, displays, equipment or other material shall comply with this section.

1028.1.1 Bleachers. *Bleachers, grandstands and folding and telescopic seating*, that are not building elements, shall comply with ICC 300.

1028.1.1.1 Spaces under grandstands and bleachers.

When spaces under *grandstands* or *bleachers* are used for purposes other than ticket booths less than 100 square feet (9.29 m²) and toilet rooms, such spaces shall be separated by *fire barriers* complying with Section 707 and *horizontal assemblies* complying with Section 711 with not less than 1-hour fire-resistance-rated construction.

1028.2 Assembly main exit. In a building, room or space used for assembly purposes that has an *occupant load* of greater than 300 and is provided with a main *exit*, the main *exit* shall be of sufficient width to accommodate not less than one-half of the *occupant load*, but such width shall not be less than the total required width of all *means of egress* leading to the *exit*. Where the building is classified as a Group A occupancy, the main *exit* shall front on at least one street or an unoccupied space of not less than 10 feet (3048 mm) in width that adjoins a street or *public way*. In a building, room or space used for assembly purposes where there is no well-defined main *exit* or where multiple main *exits* are provided, *exits* shall be permitted to be distributed around the perimeter of the building provided that the total width of egress is not less than 100 percent of the required width.

1028.3 Assembly other exits. In addition to having access to a main *exit*, each level in a building used for assembly purposes having an *occupant load* greater than 300 and provided with a main *exit*, shall be provided with additional *means of egress* that shall provide an egress capacity for at least one-half of the total *occupant load* served by that level and shall comply with Section 1015.2. In a building used for assembly purposes where there is no well-defined main *exit* or where multiple main *exits* are provided, *exits* for each level shall be permitted to be distributed around the perimeter of the building, provided that the total width of egress is not less than 100 percent of the required width.

1028.4 Foyers and lobbies. In Group A-1 occupancies, where persons are admitted to the building at times when seats are not available, such persons shall be allowed to wait in a lobby or similar space, provided such lobby or similar space shall not encroach upon the required clear width of the *means of egress*. Such foyer, if not directly connected to a public street by all the main entrances or *exits*, shall have a straight and unobstructed *corridor* or path of travel to every such main entrance or *exit*.

1028.5 Interior balcony and gallery means of egress. For balconies, galleries or press boxes having a seating capacity of 50 or more located in a building, room or space used for assembly purposes, at least two *means of egress* shall be pro-

vided, with one from each side of every balcony, gallery or press box and at least one leading directly to an *exit*.

1028.6 Width of means of egress for assembly. The clear width of *aisles* and other *means of egress* shall comply with Section 1028.6.1 where smoke-protected seating is not provided and with Section 1028.6.2 or 1028.6.3 where smoke-protected seating is provided. The clear width shall be measured to walls, edges of seating and tread edges except for permitted projections.

1028.6.1 Without smoke protection. The clear width of the *means of egress* shall provide sufficient capacity in accordance with all of the following, as applicable:

1. At least 0.3 inch (7.6 mm) of width for each occupant served shall be provided on *stairs* having riser heights 7 inches (178 mm) or less and tread depths 11 inches (279 mm) or greater, measured horizontally between tread *nosings*.
2. At least 0.005 inch (0.127 mm) of additional *stair* width for each occupant shall be provided for each 0.10 inch (2.5 mm) of riser height above 7 inches (178 mm).
3. Where egress requires *stair* descent, at least 0.075 inch (1.9 mm) of additional width for each occupant shall be provided on those portions of *stair* width having no *handrail* within a horizontal distance of 30 inches (762 mm).
4. Ramped *means of egress*, where slopes are steeper than one unit vertical in 12 units horizontal (8-percent slope), shall have at least 0.22 inch (5.6 mm) of clear width for each occupant served. Level or ramped *means of egress*, where slopes are not steeper than one unit vertical in 12 units horizontal (8-percent slope), shall have at least 0.20 inch (5.1 mm) of clear width for each occupant served.

1028.6.2 Smoke-protected seating. The clear width of the *means of egress* for *smoke-protected assembly seating* shall not be less than the *occupant load* served by the egress element multiplied by the appropriate factor in Table 1028.6.2. The total number of seats specified shall be those within the space exposed to the same smoke-protected environment. Interpolation is permitted between the specific values shown. A life safety evaluation, complying with NFPA 101, shall be done for a facility utilizing the reduced width requirements of Table 1028.6.2 for *smoke-protected assembly seating*.

Exception: For an outdoor *smoke-protected assembly seating* with an *occupant load* not greater than 18,000, the clear width shall be determined using the factors in Section 1028.6.3.

1028.6.2.1 Smoke control. *Means of egress* serving a *smoke-protected assembly seating* area shall be provided with a smoke control system complying with Section 909 or natural ventilation designed to maintain the smoke level at least 6 feet (1829 mm) above the floor of the *means of egress*.

3. In a building, room or space used for assembly purposes or portions thereof without ramped or tiered floors for seating and with greater than 200 seats, the seats shall be fastened together in groups of not less than three or the seats shall be securely fastened to the floor.
4. In a building, room or space used for assembly purposes where flexibility of the seating arrangement is an integral part of the design and function of the space and seating is on tiered levels, a maximum of 200 seats shall not be required to be fastened to the floor. Plans showing seating, tiers and aisles shall be submitted for approval.
5. Groups of seats within a building, room or space used for assembly purposes separated from other seating by railings, guards, partial height walls or similar barriers with level floors and having no more than 14 seats per group shall not be required to be fastened to the floor.
6. Seats intended for musicians or other performers and separated by railings, guards, partial height walls or similar barriers shall not be required to be fastened to the floor.

1028.13 Handrails. Ramped aisles having a slope exceeding one unit vertical in 15 units horizontal (6.7-percent slope) and aisle stairs shall be provided with handrails in compliance with Section 1012 located either at one or both sides of the aisle or within the aisle width.

Exceptions:

1. Handrails are not required for ramped aisles having a gradient no greater than one unit vertical in eight units horizontal (12.5-percent slope) and seating on both sides.
2. Handrails are not required if, at the side of the aisle, there is a guard that complies with the graspability requirements of handrails.
3. Handrail extensions are not required at the top and bottom of aisle stair and aisle ramp runs to permit crossovers within the aisles.

1028.13.1 Discontinuous handrails. Where there is seating on both sides of the aisle, the handrails shall be discontinuous with gaps or breaks at intervals not exceeding five rows to facilitate access to seating and to permit crossing from one side of the aisle to the other. These gaps or breaks shall have a clear width of at least 22 inches (559 mm) and not greater than 36 inches (914 mm), measured horizontally, and the handrail shall have rounded terminations or bends.

1028.13.2 Intermediate handrails. Where handrails are provided in the middle of aisle stairs, there shall be an additional intermediate handrail located approximately 12 inches (305 mm) below the main handrail.

1028.14 Assembly guards. Guards adjacent to seating in a building, room or space used for assembly purposes shall comply with Sections 1028.14.1 through 1028.14.3.

1028.14.1 Cross aisles. Cross aisles located more than 30 inches (762 mm) above the floor or grade below shall have guards in accordance with Section 1013.

Where an elevation change of 30 inches (762 mm) or less occurs between a cross aisle and the adjacent floor or grade below, guards not less than 26 inches (660 mm) above the aisle floor shall be provided.

Exception: Where the backs of seats on the front of the cross aisle project 24 inches (610 mm) or more above the adjacent floor of the aisle, a guard need not be provided.

1028.14.2 Sightline-constrained guard heights. Unless subject to the requirements of Section 1028.14.3, a fascia or railing system in accordance with the guard requirements of Section 1013 and having a minimum height of 26 inches (660 mm) shall be provided where the floor or foot-board elevation is more than 30 inches (762 mm) above the floor or grade below and the fascia or railing would otherwise interfere with the sightlines of immediately adjacent seating. At bleachers, a guard must be provided where required by ICC 300.

Exception: The height of the guard in front of seating shall be measured from the adjacent walking surface.

1028.14.3 Guards at the end of aisles. A fascia or railing system complying with the guard requirements of Section 1013 shall be provided for the full width of the aisle where the foot of the aisle is more than 30 inches (762 mm) above the floor or grade below. The fascia or railing shall be a minimum of 36 inches (914 mm) high and shall provide a minimum 42 inches (1067 mm) measured diagonally between the top of the rail and the nosing of the nearest tread.

SECTION 1029 EMERGENCY ESCAPE AND RESCUE

1029.1 General. In addition to the means of egress required by this chapter, provisions shall be made for emergency escape and rescue openings in Group R-2 occupancies in accordance with Tables 1021.2(1) and 1021.2(2) and Group R-3 occupancies. Basements and sleeping rooms below the fourth story above grade plane shall have at least one exterior emergency escape and rescue opening in accordance with this section. Where basements contain one or more sleeping rooms, emergency escape and rescue openings shall be required in each sleeping room, but shall not be required in adjoining areas of the basement. Such openings shall open directly into a public way or to a yard or court that opens to a public way.

Exceptions:

1. Basements with a ceiling height of less than 80 inches (2032 mm) shall not be required to have emergency escape and rescue openings.
2. Emergency escape and rescue openings are not required from basements or sleeping rooms that have an exit door or exit access door that opens

FROM 2012 IBC

TABLE 1607.1—continued
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_u , AND
MINIMUM CONCENTRATED LIVE LOADS^a

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
23. Penal institutions Cell blocks Corridors	40 100	—
24. Recreational uses: Bowling alleys, poolrooms and similar uses Dance halls and ballrooms Gymnasiums Reviewing stands, grandstands and bleachers Stadiums and arenas with fixed seats (fastened to floor)	75 ^{aa} 100 ^{aa} 100 ^{aa} 100 ^{aa} 60 ^{aa,bb}	—
25 Residential One- and two family dwellings Uninhabitable attics without storage ^c Uninhabitable attics with storage ^{d, e, f, g} Habitable attics and sleeping areas ^h All other areas Hotels and multifamily dwellings Private rooms and corridors serving them Public rooms ^{aa} and corridors serving them	10 20 30 40 40 100	—
26. Roofs All roof surfaces subject to maintenance workers Awnings and canopies: Fabric construction supported by a skeleton structure All other construction Ordinary flat, pitched, and curved roofs (that are not occupiable) Where primary roof members are exposed to a work floor, at single panel point of lower chord of roof trusses or any point along primary structural members supporting roofs: Over manufacturing, storage warehouses, and repair garages All other primary roof members Occupiable roofs: Roof gardens Assembly areas All other similar areas	5 nonreducible 20 20 100 100 ^{aa} Note 1	300 2,000 300 Note 1
27. Schools Classrooms Corridors above first floor First-floor corridors	40 80 100	1,000 1,000 1,000
28. Scuttles, skylight ribs and accessible ceilings	—	200
29. Sidewalks, vehicular drive ways and yards, subject to trucking	250 ^{a, aa}	8,000 ^a

(continued)

TABLE 1607.1—continued
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_u , AND
MINIMUM CONCENTRATED LIVE LOADS^a

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
30. Stairs and exits One- and two-family dwellings All other	40 100	300 ^a 300 ^a
31. Storage warehouses (shall be designed for heavier loads if required for anticipated storage) Heavy Light	250 ^{aa} 125 ^{aa}	—
32. Stores Retail First floor Upper floors Wholesale, all floors	100 75 125 ^{aa}	1,000 1,000 1,000
33. Vehicle barriers	See Section 1607.8.3	
34. Walkways and elevated platforms (other than exitways)	60	—
35. Yards and terraces, pedestrians	100 ^{aa}	—

For SI: 1 inch = 25.4 mm, 1 square inch = 645.16 mm²,
1 square foot = 0.0929 m²,
1 pound per square foot = 0.0479 kN/m², 1 pound = 0.004448 kN,
1 pound per cubic foot = 16 kg/m³.

- a. Floors in garages or portions of buildings used for the storage of motor vehicles shall be designed for the uniformly distributed live loads of Table 1607.1 or the following concentrated loads: (1) for garages restricted to passenger vehicles accommodating not more than nine passengers, 3,000 pounds acting on an area of 4.5 inches by 4.5 inches; (2) for mechanical parking structures without slab or deck that are used for storing passenger vehicles only, 2,250 pounds per wheel.
- b. The loading applies to stack room floors that support nonmobile, double-faced library book stacks, subject to the following limitations:
 1. The nominal bookstack unit height shall not exceed 90 inches;
 2. The nominal shelf depth shall not exceed 12 inches for each face; and
 3. Parallel rows of double-faced book stacks shall be separated by aisles not less than 36 inches wide.
- c. Design in accordance with ICC 300.
- d. Other uniform loads in accordance with an approved method containing provisions for truck loadings shall also be considered where appropriate.
- e. The concentrated wheel load shall be applied on an area of 4.5 inches by 4.5 inches.
- f. The minimum concentrated load on stair treads shall be applied on an area of 2 inches by 2 inches. This load need not be assumed to act concurrently with the uniform load.
- g. Where snow loads occur that are in excess of the design conditions, the structure shall be designed to support the loads due to the increased loads caused by drift buildup or a greater snow design determined by the building official (see Section 1608).
- h. See Section 1604.8.3 for decks attached to exterior walls.
- i. Uninhabitable attics without storage are those where the maximum clear height between the joists and rafters is less than 42 inches, or where there are not two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 inches in height by 24 inches in width, or greater, within the plane of the trusses. This live load need not be assumed to act concurrently with any other live load requirements.

(continued)

CHAPTER 34

EXISTING STRUCTURES

SECTION 3401
GENERAL

3401.1 Scope. The provisions of this chapter shall control the *alteration, repair, addition* and change of occupancy of existing buildings and structures.

Exception: Existing *bleachers, grandstands* and folding and telescopic seating shall comply with ICC 300.

3401.2 Maintenance. Buildings and structures, and parts thereof, shall be maintained in a safe and sanitary condition. Devices or safeguards which are required by this code shall be maintained in conformance with the code edition under which installed. The owner or the owner's designated agent shall be responsible for the maintenance of buildings and structures. To determine compliance with this subsection, the *building official* shall have the authority to require a building or structure to be reinspected. The requirements of this chapter shall not provide the basis for removal or abrogation of fire protection and safety systems and devices in existing structures.

3401.3 Compliance. *Alterations, repairs, additions* and changes of occupancy to, or relocation of, existing buildings and structures shall comply with the provisions for *alterations, repairs, additions* and changes of occupancy or relocation, respectively, in the *International Energy Conservation Code, International Fire Code, International Fuel Gas Code, International Mechanical Code, International Plumbing Code, International Property Maintenance Code, International Private Sewage Disposal Code, International Residential Code* and NFPA 70. Where provisions of the other codes conflict with provisions of this chapter, the provisions of this chapter shall take precedence.

3401.4 Building materials and systems. Building materials and systems shall comply with the requirements of this section.

3401.4.1 Existing materials. Materials already in use in a building in compliance with requirements or approvals in effect at the time of their erection or installation shall be permitted to remain in use unless determined by the *building official* to be unsafe per Section 116.

3401.4.2 New and replacement materials. Except as otherwise required or permitted by this code, materials permitted by the applicable code for new construction shall be used. Like materials shall be permitted for repairs and alterations, provided no hazard to life, health or property is created. Hazardous materials shall not be used where the code for new construction would not *permit* their use in buildings of similar occupancy, purpose and location.

3401.4.3 Existing seismic force-resisting systems. Where the existing seismic force-resisting system is a type that can be designated ordinary, values of R , Ω_w , and C_d for

the existing seismic force-resisting system shall be those specified by this code for an ordinary system unless it is demonstrated that the existing system will provide performance equivalent to that of a detailed, intermediate or special system.

3401.6 Alternative compliance. Work performed in accordance with the *International Existing Building Code* shall be deemed to comply with the provisions of this chapter.

3401.5 Dangerous conditions. The *building official* shall have the authority to require the elimination of conditions deemed *dangerous*.

SECTION 3402
DEFINITIONS

3402.1 Definitions. The following terms are defined in Chapter 2:

DANGEROUS.

EXISTING STRUCTURE.

PRIMARY FUNCTION.

SUBSTANTIAL STRUCTURAL DAMAGE.

TECHNICALLY INFEASIBLE.

SECTION 3403
ADDITIONS

3403.1 General. *Additions* to any building or structure shall comply with the requirements of this code for new construction. *Alterations* to the existing building or structure shall be made to ensure that the existing building or structure together with the *addition* are no less conforming with the provisions of this code than the existing building or structure was prior to the *addition*. An existing building together with its *additions* shall comply with the height and area provisions of Chapter 5.

3403.2 Flood hazard areas. For buildings and structures in *flood hazard areas* established in Section 1612.3, any *addition* that constitutes substantial improvement of the existing structure, as defined in Section 1612.2, shall comply with the flood design requirements for new construction, and all aspects of the existing structure shall be brought into compliance with the requirements for new construction for flood design.

For buildings and structures in *flood hazard areas* established in Section 1612.3, any additions that do not constitute substantial improvement of the existing structure, as defined in Section 1612.2, are not required to comply with the flood design requirements for new construction.

FM—continued

4474 (04)	Evaluating the Simulated Wind Uplift Resistance of Roof Assemblies Using Static Positive and/or Negative Differential Pressures	1504.3.1
4880 (2005)	American National Standard for Evaluating Insulated Wall or Wall and Roof/Ceiling Assemblies, Plastic Interior Finish Materials, Plastic Exterior Building Panels, Wall/Ceiling Coating Systems, Interior and Exterior Finish Systems	2603.4, 2603.10

GA

Gypsum Association
810 First Street N.E #510
Washington, DC 20002-4268

Standard reference number	Title	Referenced in code section number
GA 216—07	Application and Finishing of Gypsum Panel Products	Table 2508.1, 2509.2
GA 600—09	Fire-Resistance Design Manual, 18th Edition	Table 721.1(1), Table 721.1(2), Table 721.1(3)

HPVA

Hardwood Plywood Veneer Association
1825 Michael Faraday Drive
Reston, VA 20190

Standard reference number	Title	Referenced in code section number
HP-1—2009	Standard for Hardwood and Decorative Plywood	2303.3, 2304.6.2

HUD

U.S. Department of Housing and Urban Development
451 7th Street, SW
Washington, DC 20410

Standard reference number	Title	Referenced in code section number
HUD 24 CFR Part 3280 (2008)	Manufactured Home Construction and Safety Standards	G201

ICC

International Code Council Inc.
500 New Jersey Ave, NW
6th Floor
Washington, DC 20001

Standard reference number	Title	Referenced in code section number
ICC A117.1—09	Accessible and Usable Buildings and Facilities	202, 907.5.2.3.4, 1007.9, 1010.1, 1010.7.5, 1010.10, 1011.4, 1022.9, 1101.2, 1107.2, 1109.1, 1109.2, 1109.5.1, 1109.5.2, 1110.3, 1110.4, 1110.4.2, 3008.7.7.1, 3008.7.7.2, 3411.8.2, 3411.8.3, E101.2, E104.2, E104.2.1, E104.3.4, E106.4.9, E107.3, E108.3, E108.4, E109.2.2.2, E109.2.2.3, E109.2.3, E109.2.5, E110.2
ICC 300—12	ICC Standard on Bleachers, Folding and Telescopic Seating and Grandstands.	1028.1.1, 1028.14.2, Table 1607.1, 3401.1
ICC 400—12	Standard on Design and Construction of Log Structures	2301.2
ICC 500—08	ICC/NSSA Standard on the Design and Construction of Storm Shelters.	202, 423.1
ICC 600—08	Standard for Residential Construction in High-wind Regions	1609.1.1, 1609.1.1.1, 2308.2.1
IEBC—12	International Existing Building Code*	3401.5
IECC—12	International Energy Conservation Code*	101.4.6, 201.3, 1203.1, 1203.3.2, 1301.1.1, 1405.3, 3401.3

CHAPTER 5

EXISTING BLEACHERS, FOLDING AND TELESCOPIC SEATING,
AND GRANDSTANDS

SECTION 501

APPLICATION AND ADMINISTRATION

501.1 General. Existing bleachers, folding and telescopic seating, and grandstands that exist prior to the adoption of this standard shall comply with this chapter and the applicable provisions of Chapter 1.

Exception: Tiered seating where the top of footboards, seatboards, aisles and cross aisles are not more than 30 inches (762 mm) above the floor or grade below, unless judged by the code official to represent a distinct hazard.

501.2 Inspection. All existing tiered seating shall be inspected and evaluated at least once a year by a qualified person for compliance with the provisions of this chapter. All folding and telescopic seating shall be inspected to evaluate compliance with the manufacturer's installation and operational instructions, including an inspection during the opening and closing of such seating.

501.3 Violations. Where deficiencies are identified, the owner shall have until [DATE TO BE INSERTED BY JURISDICTION] to abate the unsafe condition as deemed necessary by the code official.

501.4 Alterations. Alterations to any tiered seating shall conform with the requirements of this standard for new construction. Portions of the structure not altered and not affected by the alteration are not required to comply with the requirements in this standard for a new structure.

SECTION 502
MAINTENANCE AND REPAIRS

502.1 Structural. Existing tiered seating shall be maintained structurally sound as follows.

1. Components or fasteners shall not be broken, damaged, badly deteriorated or missing.
2. Adequate bearing shall be provided. The structure shall bear uniformly on the floor or ground in a manner so as to safely support the structure.
3. All components and systems shall be in proper working condition.

502.2 Durability. Materials used in the construction of outdoor installations shall be weather resistant. Where wood is used, it shall be naturally durable or preservative-treated wood as defined in the building code or other approved material. Where ferrous metal is used, it shall be protected from corrosion. Fasteners shall consist of aluminum or other approved corrosion-resistant materials or shall be provided with approved corrosion-resistant coatings such as copper or zinc.

502.2.1 Application. Bleachers, folding and telescopic seating and grandstand systems included in this standard

must be maintained in good repair and structurally sound so not to pose a threat to the public health, safety or welfare.

502.2.2 Unsafe conditions. Seating shall comply with Chapter 5 and the applicable sections of the *International Property Maintenance Code*, Sections 304 and 305. In seating areas affected by damage, unsafe operation or defects that interfere with safe use shall not be used or operated until satisfactory repairs restoring safe use is completed.

502.2.3 Notification. Written or oral notice shall be provided to the owner or owner's representative of the unsafe condition upon discovering the defective conditions.

502.3 Interior corrosive environment. Installations located in interior corrosive environments, such as those located in conjunction with indoor pools, shall be corrosion resistant.

502.4 Spaces beneath seats. Spaces beneath or adjacent to seating structures shall comply with the building code and fire code.

SECTION 503
GUARDS

503.1 Required guards. Guards shall be provided in the following areas.

1. Along open-sided walking surfaces, cross aisles, stepped aisles, ramps and landings of tiered seating areas which are located more than 30 inches (762 mm) above the floor or grade below. Such guards shall be not less than 36 inches (1067 mm) high, measured vertically above the leading edge of the tread, adjacent walking surface or center of adjacent bench seat.

Exceptions:

1. Where the uppermost seat is located less than or equal to 55 inches (1397 mm) above the floor or ground below.
2. Where located adjacent to a wall and the space between the wall and the tiered seating is less than 4 inches (102 mm).
2. Unless subject to the requirements of Item 3, a guard with a minimum height of 26 inches (660 mm) shall be provided where the floor or footboard elevation is more than 30 inches (762 mm) above the floor or grade below and the guard would otherwise interfere with the sightlines of immediately adjacent seating.
3. A guard shall be provided for the full width of the aisle where the foot of the aisle is more than 30 inches (762 mm) above the floor or ground below. The guard shall be a minimum of 36 inches (914 mm) high.

CHAPTER 3 CONSTRUCTION

SECTION 301 GENERAL

301.1 General. The construction or installation of new bleachers, folding and telescopic seating, and grandstands and press boxes shall comply with the provisions of this chapter.

301.2 Location on lot. Outdoor installations shall be located at least 10 feet (3048 mm) from adjacent lot lines and from other buildings on the same lot unless the exterior walls and openings of the adjacent building are protected in accordance with the building code.

SECTION 302 PERMITTED MATERIALS

302.1 Combustibility and flame spread. Bleachers, folding and telescopic seating, and grandstands shall be permitted to be constructed of combustible or noncombustible materials. Such installations within a building shall not be considered interior finish relative to the application of the building code.

302.2 Durability. Materials used in the construction of outdoor installations shall be weather resistant. Where wood is used, it shall be naturally durable or preservative-treated wood as defined in the building code or other approved material. Where ferrous metal is used, it shall be protected from corrosion. Fasteners shall consist of aluminum or other approved corrosion-resistant materials or shall be provided with approved corrosion-resistant coatings such as copper or zinc.

302.3 Interior corrosive environment. Installations located in interior corrosive environments, such as those located in conjunction with indoor pools, shall be corrosion resistant.

SECTION 303 STRUCTURAL DESIGN

303.1 Design. The structural design shall be in accordance with the building code.

303.2 Loads. Bleachers, folding and telescopic seating, and grandstands shall be designed for a uniform live load of 100 pounds per square foot (psf) (4788 Pa). Press boxes shall be designed for a uniform live load of 50 psf (2394 Pa). The components of the installation shall be designed to support the loads listed in Table 303.2.

303.3 Other loads. Bleachers, folding and telescopic seating and grandstands, and press boxes and platforms attached to such installations, subject to wind, snow, seismic and other loads, shall be designed in accordance with the building code.

303.4 Horizontal Sway Loads. Bleachers, folding and telescopic seating, and grandstands shall be designed to resist lateral forces produced by the sudden and concerted motion of spectators.

303.4.1 Sway Parallel to Seating. A horizontal load of 24 pounds per linear foot shall be applied parallel to seating at the footboard level of each row of seating.

303.4.2 Sway Perpendicular to Seating. A horizontal load of 10 pounds per linear foot shall be applied perpendicular to seating at the footboard level of each row of seating.

303.5 Load Combinations. In addition to the load combinations required to be considered for design in accordance with the building code, the additional load combinations in Section 303.5.1 or in Section 303.5.2 shall be considered. Parallel and perpendicular sway loads need not be considered simultaneously. Also uniform, concentrated and infill loads need not be considered simultaneously.

TABLE 303.2
DESIGN LOADS

TIERED SEATING ELEMENT	LOAD TYPE	LOAD
Seats (vertical)	L	120 pounds per linear foot.
Treads	L	Stair treads and aisle stair treads shall be designed to resist a minimum concentrated load of 300 pounds on an area of 4 square inches.
Handrails and guards, uniform load	R ₁	Handrail assemblies and guards shall be designed to resist a load of 50 pounds per linear foot (pound per foot) applied in any direction at the top. The supporting elements shall transfer this load to the structure.
Handrails and guards, concentrated load	R ₁	Handrail assemblies and guards shall be able to resist a single concentrated load of 200 pounds, applied in any direction at any direction along the top. Attachment devices and supporting elements shall transfer this load to the structure.
Guards, infill components	R ₁	Intermediate rails (all those except the handrail), balusters, and panel fillers (including flexible infill components) shall be designed to withstand a horizontally applied normal load of 50 pounds on an area equal to 1 square foot, including openings and space between rails. Application of the loads shall not allow guard openings greater than that permitted by Sections 408.2 and 503.2.

For SI: 1 square inch = 645.16 mm². 1 square foot = 0.0929 m². 1 pound = 4.448 N, 1 pound per linear foot = 14.594 N/m.