



IPA Systems Inc.

**UNIVERSITY OF MICHIGAN STADIUM
IPANEX MODIFIED REPAIR MORTAR**

1972 – 2001

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In the spring of 1972 a program was started to rehabilitate the entire interior concrete surface of the University of Michigan Stadium. The risers and tread surface were severely deteriorated or spalled in much of the 460,000 square feet of concrete surface.

The method of repair was specified using an Ipanex Modified Repair System. Between 1972 and 1979 contracts were let each summer. By 1979 the entire interior rehabilitation project was completed.

The repair method was as follows:

1. Removal of all loose and deteriorating concrete.
2. Power washing to clean surfaces.
3. Application of Duripal to condition and stabilize the substrate.
4. IPANEX modified slurry coat.
5. IPANEX modified mortar.

Additional information is contained in the "Stadium Steps Repaired With Zero Slump Mortar" article from *Concrete International* magazine, September 1980, which is attached.

Photographs of the stadium from various times and stages follow with explanatory notes – pages 2 – 9.

Summary and Conclusion – page 10.

For Orientation Purposes



1998 project, 5000 new seats added at the top

Metal seats

IPANEX modified mortar repairs
1972 - 79

1990 project
Field lowered 3½ feet
First 6 rows of seats and brick wall are new

IPANEX modified mortar repairs
1972 - 79



March 13, 2001



Circa 1972, fifty-yard line (after seats had been removed on the first three rows).



Photograph taken circa 1989.
Same location after repair completed.



Photograph taken April 1990.

The repairs were made circa 1972 – 1973.
Note that stanchions are exposed on front face of riser.



Photograph taken circa 1973 - 1974 concurrent with construction. Forming changed so that stanchions are embedded.



Photograph taken April 1990.
Note embedded stanchions. This method was used after 1972 for the balance of the project.



March 13, 2001 – View of North end zone.



March 13, 2001 – South end zone – spring snow still melting.



March 13, 2001 – View of east side, showing current condition of repairs done in 1970's with IPANEX Modified repair mortar.



Metal seats

Repair mortar placed circa
1972 – 1979, Rows 1 - 70

New concrete section on East
side (approximately three
sections). These sections
were replaced as part of a
structural rehabilitation of
exterior columns and
beams. Completed in the
1990's.

Repairs

March 13, 2001 – New and old as indicated.



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March 13, 2001

Since completion of the repairs in 1979, this photograph clearly shows results of two major projects completed in 1990 and 1998. In 1990 the playing field surface was lowered by 3½ feet and six rows of seats were added. The 1998 project added seating at the top of the stadium, approximately 5,000 additional seats. Seating capacity 1979 - 101,500; 1990 - 102,500; currently - 107,000.



Summary

The seven year repair project using IPANEX modified mortar provided 20 – 25 years to date of durable surface permitting the University of Michigan to complete other necessary stadium enhancement projects between the years 1980 and 2001.

Conclusion

The IPANEX modified repair system is still functioning and will likely continue to do so for a good number of years into the future.