WAUNAKEE COMMUNITY SCHOOL DISTRICT

WAUNAKEE COMMUNITY MIDDLE SCHOOL TRACK PAVEMENT CONDITION REPORT

Prepared for:
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INTRODUCTION

An existing condition review was performed to provide information and assist in planning the maintenance or reconstruction of the running track at Waunakee Community Middle School, located at 501 South Street, Waunakee, Wisconsin 53597. This report includes background information available at the time of this report, an engineering discussion to aid in understanding the review, site observations, photos of the project, conclusions and recommendations for future options regarding the running track.

BACKGROUND INFORMATION

No formal background information was provided for our work. The existing track is a 6-lane 302 meter Running Track. The original date of construction is not known but appears in historic aerial photography as early as 1962. The track infield and adjacent field to the west was completed in 2026 with the Middle School reconstruction project.

ENGINEERING DISCUSSION

Pavement deterioration is caused by two primary factors: weathering & aging caused by the environment, and structural damage caused by repeated use or the consequences of limitations during original construction. It's important to determine which factor has primary influence over each type of distress in order to select the most applicable rehabilitation technique.

The rate or speed of pavement deterioration depends on the environment (soils, moisture, temperature fluctuation, etc.), the type and frequency of use (loading, abrasion, etc.), the quality of the original construction, and maintenance procedures. Documenting why the pavement is deteriorating in various locations of distress provides information valuable for selecting a cost-effective repair or deciding to do full replacement.

DEFINITIONS

Surface Defects:

Raveling – loss of asphalt in the surface of a pavement from the surface downward, caused by: eroding of the bituminous oil from the aggregate, asphalt hardening due to the evaporation of solvents, poor compaction during original construction, or inadequate asphalt content.

Surface Deformation:

Rutting – displacement of pavement surface creating channels in wheel paths. Traffic loading causes compaction or displacement of unstable material. Severe rutting (over 2”) may be caused by failure of base course or subgrade due to consolidation.

Distortion – rippling and/or shoving (washboard) of a pavement surface in a direction perpendicular to vehicle movement. Inadequate asphalt mixtures cause unstable pavement resulting in the distress. It may also result from settling or frost heaving of underlying subgrade soils.

Cracks:
Transverse – a crack that is approximately perpendicular to the center line of the pavement. They often occur at regularly spaced intervals. These cracks are the result of shrinkage and expansion due to temperature changes combined with aging that causes the asphalt to become brittle and hard. They start as hairline cracks that widen with age. Aging also causes additional cracks to form at closer spacing. If transverse or any type of cracks are not properly sealed, they will deteriorate quickly from moisture penetration that contributes to freeze-thaw damage of the pavement on each side of crack and frost heaving of the underlying soils. Cracks should be sealed when they become ¼" or more wide.

Longitudinal – cracks run parallel to the centerline of the pavement in the direction of traffic. Center line cracks often occur at the edge of the asphalt mats laid down during the original paving passes. They are caused by inadequate bonding between the vertical edges of each pass of the paver during construction. Or they might be reflection cracks from the underlying pavement. Longitudinal cracks in the wheel path indicate fatigue failure from heavy vehicle loads. Cracks within one foot of the edge are caused by insufficient shoulder support, poor drainage, or frost action. Like Transverse cracks, they usually start as hairline or vary narrow cracks and widen with age. Any cracks should be sealed when they become ¼" or more wide.

Reflection – cracks in overlays located directly over cracks in the underlying pavement. Movement in the underlying pavement is concentrated at crack locations stressing the overlay causing a reflection of the crack pattern in the pavement underneath. They are difficult to prevent and correct. Thick overlays might work, however, reconstruction is the only sure solution.

Block – a crack pattern that is interconnected forming large blocks. The cracks usually intersect at approximately right angles. The blocks range from one foot to approximately 10’ or more across. The smaller the blocks are indicates more advanced aging caused by shrinking and brittle asphalt over time.

Alligator – cracks forming small pieces ranging in size from about 1” to 6” resembling alligator skin or the roads on a state highway map. This is caused by failure of the flexing of pavement due to traffic loading (fatigue) and an inadequate base course thickness or insufficient subgrade stability.

Patches and Potholes:
Patches – the surface repair of an original asphalt surface due to pavement defect or utility construction. Often the original cause of the pavement defect is still present.

Potholes – loss of asphalt and base course materials usually in a relatively small localized area. They can be the result of a number of causes initiated by traffic loading such as inadequate pavement cross section, unstable subgrade, poor original asphalt mixture, and quite often poor drainage.

SITE OBSERVATIONS

Observations of the Waunakee Middle School running track were performed by John Kneer, PLA, on September 23, 2026. The pavement onsite was observed for the possible presence of various distress conditions such as surface defects, surface deformations, cracks, and patches or potholes. Not all of these distresses were present at this running track. An overview of our site observations follows below.

SURFACE DEFECTS

The running track is bare asphalt with extremely faded track lane striping. There is no rubberized surfacing.

Photo 1: Worn Track Surfacing

1. No major asphalt surface defects were observed.
2. No rubberized track surfacing and running on bare asphalt is very hard on student athlete lower extremities and is highly recommended.
3. The useful life of the asphalt surface appears to be near with the presence of nearly all surface oils .
4. Vegetation has overtaken significant portions of lanes 1 and 6. In their current condition, they are unusable.

SURFACE DEFORMATION

Settlement of the track was observed most severely along the north curve. There is no apparent rutting however distortion of the surface was observed in these locations. Because the underlying subgrade soils are frost-susceptible, and no apparent sub-surface drainage is present, it is possible some heaving occurs in the freeze / thaw portions of the year.

Photo 2: Surface Deformation – North Curve

CRACKS

Some major traverse cracking was observed. Minor transverse and longitudinal cracking has also been documented. It appears no regular maintenance such as crack filling in the past and has proven successful.

Photo 3: Longitudinal and Transverse Cracking

PATCHES AND POTHOLES

No potholes were observed in the pavement however several patches were completed over time.

MISCELLANEOUS DISCUSSION

The running track surface drains relatively poorly with the infield area and the west field swales infiltrating water in swales immediately adjacent to the track. These swales hold water with no apparent underdrain system is present inside or outside the track perimeter. This can potentially cause a saturated base that would be affected by freeze / thaw cycles.

CONCLUSIONS

Our opinions are based on available background information, our site survey work, and our observations of the running track. If this information is found to be inaccurate or should additional information become available, please contact us to see if our opinions change.

Environmental:

Typical weathering and aging have caused the track asphalt surfacing to become brittle and cracks present allow for infiltration of water. The presence of frost susceptible soils, subsurface moisture, and freeze / thaw cycles have caused minor surface distortion, major and minor cracking of the asphalt surface.

Structural:

Structural issues were observed such as subgrade settlement, or frost heaving, potentially caused by a lack of drainage on the north, south, and west sides of the track. Additional underdrain is recommended outside of the track, particularly on the west side where higher elevations.

RECOMMENDATIONS

We have provided recommendations based on the preceding information and our review. Recommendations represent a balance between safety, performance, life cycle, and economic impacts. It is our opinion the following options are feasible for the track surface redevelopment and are listed in order of preference, highest to lowest recommendation.

OPTION A: NEW 400 METER 6-LANE ASPHALT & TRACK RUBBERIZED SURFACE

Replace the track in full at 400 Meters with a full synthetic turf competition infield.

- Most expensive option, but most use potential.
- Requires additional feasibility study and engineering design services.
- Impacts existing drives and turnaround space east of Middle School.
- Permitting required.
- Safest and most effective solution for student athletes and athlete development.
- Most flexibility for space utilization for all Middle School students.
- Budget range: $1,850,000 - $2,100,000
- (Subtract $480,000 for a natural turf in lieu of a synthetic competition infield.)

OPTION B: RECONSTRUCTION OF EXISTING TRACK & RUBBERIZED SURFACE

Demolish and rebuild existing track, new rubberized surface, and perimeter drainage.

- Most economical while preserving the balance of the site.
- Inadequate track for competition and training for high school development at 302 meters.
- Infield area for throwing venue only, inadequate for competition.
- Requires additional engineering design services.
- Permitting required.
- Budget range: $525,000 - $610,000

STANDARD OF CARE

The recommendations contained in this report represent our opinions arrived at in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. They are based on a limited scope of work and represent our professional opinions based on data, observations and background information which are assumed to be representative of the site observed. Variations may occur outside the sampling of data, or the areas of research reviewed. If variations were present, they were not apparent by visual observation, or a review of the data submitted to us. No other representation expressed or implied, and no warranty or guarantee is included or intended in this report.

The aforementioned constitutes our understanding of the issues. If the above items have been misinterpreted or if information has been omitted, please contact our office as soon as possible to update the report and judge how our conclusions and recommendations are influenced.