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26 March 2019

**Mr. David Twombly**  
Director of School Operations  
Easton Public Schools  
50 Oliver Street  
North Easton, MA 02356

**Re: Oliver Ames High School – Turf Replacement  
Crumb Rubber Infill**

Dear **Mr. Twombly**:

Activitas is an independent landscape architecture and civil engineering firm that provides outdoor athletic facility consulting services for municipal, collegiate and professional sports clients throughout the United States. We are strictly a “client side” design firm representing only the interests of our clients. We do not sell, construct or otherwise profit from the installation of synthetic turf, or other playing field systems, or any associated products and equipment.

We were engaged by the Easton Public Schools in January of 2018 to assist you in evaluating your existing playing surface and providing recommendations for its much-needed renovation. Based upon our review of the existing 10+ year old field and the various commercially available synthetic turf systems, we are of the opinion that the best and most cost effective option for the Oliver Ames High School is to reuse the existing crumb rubber and sand infill, augmented as necessary with new crumb rubber infill, and re-install it in a new dual fiber synthetic turf carpet over resilient padding for additional player safety. This is similar to systems we have recently specified for the New England Patriots, Boston College, Dartmouth College, Harvard University, the Massachusetts Institute of Technology and UMass Amherst. It is also similar to systems we have recently specified for the following Massachusetts municipalities: the Towns of Dedham, Carver, Lexington, Weymouth and Weston, and the Cities of Lynn, Malden and Marlborough.

In all of these cases, the topic of health and human safety has been raised and carefully considered by these clients. As you are aware health concerns related to crumb rubber were reignited in 2014 at the University of Washington as a result of a national news story which first appeared on NBC and was later picked up by other outlets. The Women's Associate Head Soccer Coach became concerned that there was a link between crumb rubber and soccer players (specifically goalkeepers) that she had identified as having developed a variety of cancers within the recent past.

Because of concerns raised from that article, the Washington State Department of Health, responded to the issues raised at the University of Washington by conducting an

epidemiological study of soccer players in the State of Washington and “concluded the number of cancer cases among soccer players is less than expected based on rates of cancer among Washington residents of the same ages”. There was no correlation found between players playing on synthetic turf fields and developing cancer.

Obviously, anytime the word “cancer” is written or spoken about, it leads to an emotional discussion because everybody has been affected by this terrible disease in one way or another. Clearly, we take this issue very seriously and have reviewed volumes of information on the subject. We have also consulted with Ph.D.'s and toxicologists specializing in environmental and human health and safety and will have Marie Rudiman, Senior Toxicologist with EnviroRisk Solutions available to answer questions at our upcoming meeting with the School Committee.

To date, approximately 100 scientific, peer-reviewed, published studies have been performed worldwide on the potential health risk of using crumb rubber in general; with some specifically applied to its use in synthetic turf. As a result of these studies the following state, national and international agencies, governing bodies and academic institutions have concluded that the use of crumb rubber in athletic fields does not pose a significant human health risk, including (among others) the following:

Dutch National Institute for Public Health and Environment, Norwegian Institute of Public Health, EU - European Chemical Agency (ECHA), Connecticut Department of Public Health, New York City Department of Health, New York State Department of Health, The Washington State Department of Health and researchers from the University of Washington School of Public Health.

Additionally, Attachment A provides a partial list of the scientific literature that have found that artificial turf fields do not cause an adverse health risk in humans and are safe for use. Though there is considerable internet speculation regarding the safety of crumb rubber in synthetic turf, we are not aware of any peer-reviewed scientific study which demonstrates a link to cancer, or even an elevated health risk. The available peer reviewed studies noted above have found that chemicals of potential concern (COPCs) within the crumb rubber particle are chemically bound to the particle and are not bio-available through dermal contact, ingestion or inhalation. In non-scientific studies often cited in articles on the internet, COPCs are only released from the particle via the use of an industrial solvent that is many, many times more corrosive than human sweat or even stomach acid. The same can be said for off-gassing of SVOCs and PAHs.

There are over 12,000 crumb rubber infilled synthetic turf fields in the United States. Virtually every municipality in Massachusetts that has installed a crumb rubber field has come to the same conclusion as the following notable academic institutions: Amherst College, Boston College, Boston University, Harvard University, The Massachusetts Institute of Technology, Northeastern

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University, Tufts University, and more locally to Easton at Stonehill College, Bridgewater State University and Wheaton College. They have determined that crumb rubber fields do not pose a health risk for their athletes.

As noted, we take this issue very seriously. The project specifications have been written to require that the existing rubber infill as well as any new rubber provided, be tested per the Consumer Products Safety Commission's most stringent requirement for lead content in children's toys (below 100 ppm) and is safe for the environment and for use by people of all ages.

We look forward to reviewing this information with you later this week.

Respectfully:

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**Patrick Maguire**, RLA  
Managing Principal

Attachment A: Review of Scientific Literature

## Attachment A

### Review of Scientific Literature

Below is a partial list of the scientific literature that have found that artificial turf fields do not cause an adverse health risk in humans and are safe for use:

- "...it appears that the health risks for players who use artificial turf are not significant and that it is completely safe to engage in sports activities on this type of outdoor field." Beausoleil, et al (2009).
- Researchers "designed a comprehensive hazard assessment to evaluate and address potential human health and environmental concerns associated with the use of tire crumb in playgrounds. Human health concerns were addressed using conventional hazard analyses, mutagenicity assays, and aquatic toxicity tests of extracted tire crumb. Hazard to children appears to be minimal. We conclude that the use of tire crumb in playgrounds results in minimal hazard to children and the receiving environment." Birkholz, et al (2003).
- "PM2.5 and associated elements (including lead and other heavy metals) were either below the level of detection or at similar concentrations above artificial turf athletic fields and upwind of the fields." "The large majority of air samples collected from above artificial turf had VOC concentrations that were below the limit of detection. "Fewer bacteria were detected on artificial turf compared to natural turf." California Office of Environmental Health Hazard Assessment, (2010).
- "Health risk assessment studies suggested that users of artificial turf fields, even professional athletes, were not exposed to elevated risks. Preliminary life cycle assessment suggested that the environmental impacts of artificial turf fields were lower than equivalent grass fields." Cheng, et al. (2014).
- "In spite of the conservative nature of the assessment, cancer risks were only slightly above de minimis levels for all scenarios evaluated including children playing at the indoor facility, the scenario with the highest exposure. The calculated risks are well within typical risk levels in the community from ambient pollution sources and are below target risks associated with many air toxics regulatory programs. Chronic non-cancer risks were not elevated above a Hazard Index of 1." "Cancer risks are slightly above de minimis in all scenarios." Connecticut Department of Public Health (CDPH), (2010).
- "Based on the information reviewed none of the risk assessments showed concentrations of contaminants that would be at a level of concern, even under conservative assumptions and thus it does not appear that the ingestion of tire crumb would pose a significant health risk for children or adults." Denly, et al. (2008).
- "Cancer and noncancer risk levels were at or below de minimis levels of concern. The scenario with the highest exposure was children playing on the indoor field. Based upon these findings, outdoor and indoor synthetic turf fields are not associated with elevated adverse health risks." Ginsberg, et al. (2011).
- "Based on the available literature on exposure to rubber crumb by swallowing, inhalation and skin contact and our experimental investigations on skin contact we conclude, that

there is not a significant health risk due to the presence of rubber infill for football players on an artificial turf pitch with rubber infill from used car tyres." Hofstra, U. (2007a).

- "On the basis of estimated exposure values and the doses/concentrations which can cause harmful effects in humans or in animal experiments, it is concluded that the use of artificial turf halls does not cause any elevated health risk. This applies to children, older children, juniors and adults. The estimated Margins of Safety (MOS) also give no cause for concern." Norwegian Institute of Public Health and the Radium Hospital. (2006).
- "...crumb rubber may be used as an infill without significant impact on groundwater quality...Analysis of crumb rubber samples digested in acid revealed that the lead concentration in the crumb rubber samples were well below the federal hazard standard for lead in soil...A risk assessment for aquatic life protection...found that for the three types of crumb rubber, aquatic toxicity was found to be unlikely...A public health evaluation was conducted on the results from the ambient air sampling and concluded that the measured levels of chemicals in air at the Thomas Jefferson and John Mullaly Fields do not raise a concern for non-cancer or cancer health effects for people who use or visit the fields...the findings do not indicate that these fields are a significant source of exposure to respirable particulate matter" New York Department of Environmental Conservation (NYDEC). (2009).