YOUR GOALS. OUR MISSION.

TURF ADDENDUM – CROYDON HALL FIELD IMPROVEMENTS

1a. Synthetic turf requires compaction of the underlying soil, thus creating an impervious surface. To compensate for the fact that water can no longer filter into the soil, drainage systems must be well designed and properly maintained to avoid increased run-off.

i. **Is the proposed synthetic turf project in or near a floodzone?** The property is not located within the 100 year floodzone as shown on Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) map number 34025C0066F panel containing the project site (effective date September 25, 2009) indicates that the project site falls within Flood Zone X, defined by FEMA as an area determined to be outside the 0.2% annual chance floodplain.

ii. **Successful applicants whose projects include synthetic turf will be required to design their projects in conformance with the requirements of the NJDEP Stormwater Management rules, even if the project is otherwise exempt. Confirmation that the requirements of the Stormwater Management rules have been met will need to be submitted to Green Acres if the project is funded. Please make sure that this requirement is included on the list of required permits and administrative approvals.** Per the Concept Plan provided with the application, as the overall area of disturbance is greater than 1 acre and results in an increase of more than ¼ acre of regulated impervious surface the project is considered a Major Development. Therefore, the project will be designed to comply with the NJDEP Stormwater Management Rules under NJAC 7:8, last amended March 2, 2020.

iii. **Synthetic turf backing materials must contain sufficient holes to permit water to drain through, with more holes providing better drainage. Please indicate how backing materials were evaluated and the specifications of the selected material: Backing material will be selected based on the synthetic turf system purchased.** The Township intends to seek quotes from multiple turf vendors. The backing system selection will be made in conjunction with the stormwater design of the fields and comply with the NJDEP Stormwater Management Rules.

iv. **To prevent stormwater from running offsite, synthetic turf projects must be designed to store and slowly release stormwater. Please see response to item ii above, the project will be designed in accordance with the NJDEP Stormwater Management Rules.** The holding capacity of the storage area will comply with the NJDEP Stormwater Management Rules with a stone storage bed 24" in depth with a HDPE drainage system controlled by an outlet control structure. Additionally, the proposed improvements are located next to an existing synthetic turf field constructed in 2017 which has not adversely impacted the stormwater within the area.

v. **Site grading improvements can also promote effective stormwater management. How will the site be graded to reduce runoff?** As the proposed improvements are already located within a previously disturbed area consisting of a ball field, the overall grading of the site will not be significantly impacted. The site will be graded so that the synthetic turf does not direct stormwater off the field but is captured within the stormwater system. Conversely, the area surrounding the field will not be graded to direct stormwater onto the field.

vi. **Long-term effectiveness of the drainage system is contingent upon proper maintenance. (a) what specific maintenance activities and equipment will be employed to ensure optimum functioning of the drainage system? (b) will conduct the drainage system maintenance activities? (c) How often will the drainage system maintenance activities take place?** The Township is aware of the need for proper maintenance and has been maintaining an adjacent synthetic turf field on the site since 2017 along with other synthetic turf fields within the Township. The Township has a fully staffed recreation, public works and engineering department who are responsible for maintenance of the fields. The drainage system is inspected on a quarterly basis and before and after major storm events to determine any maintenance needs which are handled by Township staff or contracted out to a local contractor.

1b. **Turf fibers and infill type must be evaluated with regard to potential impacts to human health and the environment. (i.) List the specific turf fiber that will be used: (ii.) List the specific infill type that will be used: (iii.) Why were these types of turf fibers and infill chosen? What are the specific benefits and risks for each?** The Township anticipates seeking competitive price quotes from several synthetic turf manufacturers as part of the project and evaluated Township in terms of cost, quality of product, expected lifespan, ease of maintenance, safety, environmental impacts.

The turf fibers are anticipated to be a monofilament/slit film with a sand and sbr rubber infill along with a cooling topcoat system. Alternative infill options such as Cryogenic Crumb Rubber, Colored Man-Made Crumb Rubber, Coated Crumb Rubber, Recycled Shoe Rubber, EPDM Rubber, TPE infill, as well as other organic infill options such as cork, olive cores, and coconut husks will also be explored. As stated in NJDEP's Study "Synthetic Turf – A Review of the Current Science" dated October 23, 2025, "overall, the current body of evidence remains limited and inconclusive across many of the reviewed topics, making it difficult to establish definitive causal relationships or quantitative risk estimates" with the installation of synthetic turf and the benefits and risks are explained in this document. The Township has reviewed the study and understands the uncertainty with regard to synthetic turf and finds a benefit for its inclusion in its recreational options.

1c. **Turf fibers and infill particles migrate offsite through different mechanisms, including wind dispersal; offsite tracking on shoes, clothes, and equipment; stormwater runoff; and maintenance activities such as leaf and snow blowing. There are a variety of mitigation methods that can be employed to reduce the migration of infill and turf fibers. Failure to identify and incorporate effective migration mitigation strategies into the project description, concept plan, and cost estimate will disqualify the project. Applicants must do their due diligence and may find helpful information in The Kimo-Fidra Pitch In Guides* Although Green Acres is not endorsing these guides, they provide examples of how these issues are being addressed.** The Township is aware of the need to reduce migration of infill and turf fibers. The synthetic turf will be designed to limit runoff from the fields onto adjacent areas to limit migration of infill. Additionally, brush off zones will be provided at all access points to the field to limit migration. As previously stated, the Township has a fully staffed recreational, public works and engineering departments which provide maintenance. Education is a necessary component of the migration mitigation strategy and staff and players will be educated on the need to limit migration of the synthetic turf components from the field and potential negative impacts which could occur as a result.

1d. **Synthetic turf can increase the ambient temperatures of the neighborhood, especially in highly developed areas. Synthetic turf also has been shown to have significantly elevated surface temperatures, which can increase the risk of heat-related injuries such as contact burns and heat exhaustion or heat stroke, especially in children. Applicants must design their project to mitigate these concerns, for example by ensuring that shade trees are preserved whenever possible and/or providing shade structures. Additional shade trees can be planted for the future, but the Green Acres project must provide sufficient onsite shade at the time of completion. The impact of infill type on surface temperature must be reviewed.** No trees will be removed as part of the improvements and consideration of additional landscaping and shade tree improvements will be reviewed during the design. As previously stated, a cooling system will be installed which will result in a reduction in the field surface temperatures. Also, the dugouts for the baseball field will be covered and provide shade for participants. The Township has existing protocols for the use of synthetic turf fields during days of a heat advisory and the use of portable shade structures as necessary.

1e. **Synthetic turf can cause an increase in sports injuries due to increased joint stress and concussion risks. Bacterial infections can result from bacterial growth on synthetic turf. (i.) What specific steps will be taken to minimize the risk to facility users of injuries? (ii.) What specific steps will be taken to minimize the risk to facility users of bacterial infections?** As stated in the NDJEP's Study "Synthetic Turf – A review of the Current Science", "recent studies, which are more likely to have examined third generation synthetic turf fields, have not provided any definite conclusions on whether more injuries occur on synthetic turf than natural grass." Knowing this, the Township understands that all sports pose a risk to participants and seeks to educate all sports participants on how to safely engage in all sports and field types. The Township will follow the manufacturers' guidance on the best strategies to limit bacterial infections.

1f. **The industry standard for synthetic turf warranties is eight to ten years, though well-maintained turf may last up to 12 years. Applicants must ensure that maintenance is conducted using best management practices to maximize the life of the facility. (i) Describe how the synthetic turf will be maintained. (ii) What is the estimate up-front equipment cost of planned maintenance activities including specialized equipment to minimize infill and fiber migration. (iii) What is the estimated annual cost of maintenance activities, including: brushing, aerating, raking, sweeping, static control and disinfection, field line erasing and repainting, organic matter removal, and infill topping up.** As the Township already has a turf field at this location and multiple turf fields within the town, the anticipated upfront equipment cost is estimated at $25,000 and estimate yearly maintenance cost of $33,000 for deep grooming, infill replenishment, gmax testing, magnet sweeping, surface brushing, and field inspection & repairs as necessary.

1g. **When budgeting for synthetic turf, applicants must keep in mind the anticipated life of the facility, the cost of disposal, and the cost and frequency of replacement. Applicants must also consider Green Acres' policy to not re-fund facilities for at least 20 years and the possibility that Green Acres may not fund synthetic turf in the future.** The Township is aware of the life cycle for the synthetic turf field and has estimated the replacement cost for this field between $450,000-$500,000 at this time. The Township understands that Green Acres will not fund the replacement of synthetic turf field before 20 years has passed and would need to find alternate funding for the replacement. The Township would seek to have the waste from the turf replacement recycled as much as possible.

2. **Cost Comparison: Please prepare and attach to this Addendum an itemized 20-year horizon cost comparison between the proposed new or rehabilitated synthetic turf project, and a facility constructed or reconstructed with natural turf. Please name the source of each cost figure.** Attached please find an estimate for the project using natural turf in lieu of synthetic turf along with a usage schedule, estimated annual maintenance costs and a 20 year horizon cost comparison. As estimated, the synthetic turf has a lower cost overall for the 20 year horizon.

The life cycle analysis above is based upon the following assumptions:

- The "Average" annual maintenance cost has been utilized for both natural grass and synthetic turf.
- An inflation rate of 1.5% has been applied to the "Average" annual maintenance costs for both natural grass and synthetic turf.
- Full replacement of the synthetic turf and infill system is to occur every eight (8) years after initial installation. To simplify the analysis, the cost of same has been held constant, but in reality, it will vary with inflation and depending on construction market conditions.
- Full re-sodding of the natural grass fields is to occur every eight (8) years after initial installation. To simplify the analysis, the cost of same has been held constant, but in reality, it will vary with inflation and depending on construction market conditions.
- The Cost Per Usable Hours for a natural grass rehabilitation is based upon 1,330 hours of use per year (38 hours/week for 35 weeks).
- The Cost Per Usable Hours for a synthetic turf construction is based upon 2,408 hours of use per year (56 hours/week for 43 weeks).

- The Cost Per Usable Hours for a given year of the Life Cycle, is the cumulative "Total Cost" divided by the cumulative usable hours to date for the given year.

3. **Justification: Based on the due diligence and cost comparison performed, as detailed above, and the public engagement and feedback received, please provide a detailed and compelling summary of why synthetic turf (new or replacement) was chosen over natural turf (new, rehabilitation, or conversion back from synthetic turf) for this project. The justification discussion must specifically reference each of the due diligence considerations noted above in 1.a. through g., as well as the 20-year cost comparison findings in 2.**

   The Township believes the installation of synthetic turf is a necessary alternative to natural turf, for the following reasons:

   - The existing fields at the park can become saturated after rainfall events, partially due to limited infiltration capacity of the underlying site soils. As a result, the topsoil layer of the field remains saturated for extended periods of time, which in order to avoid damage/impact to the natural grass surface condition and to field planarity, can render the fields unusable in the day(s) following these rainfall events. As a result, the Township recreation department and recreation users must continually delay, reschedule and/or cancel practices and games, around these rainfall events. This can also include the significant cost expenditure to rent available public and/or private facilities in neighboring municipalities. The installation of a baseball/multi-sport synthetic turf field will allow for a more weather resilient field surface, to significantly reduce the occurrences of delay, rescheduling or cancellation of these sports and recreation activities.

   - Also, regarding stormwater runoff for the existing natural grass fields, in times of significant, severe and frequent rainfall events, because the topsoil may already be saturated and the underlying soils have a limiting infiltration capacity, more runoff is then directed to downstream water bodies as a result. The installation of a freely draining synthetic turf surface, with a designed underlying stormwater management system, will provide enhanced stormwater runoff attenuation during these events. In addition, this also reduces any overland flow of runoff within the field of play, as all rain that falls directly onto the field surface drains/flows directly into the underlying field stone base stormwater management system. As such, the field surface can be constructed at much lower slopes when compared to a natural grass field, which results in a superior and more desirable surface from a playability perspective.

   - The Township and the recreation users expend a great deal of time, effort and financial resources on frequent maintenance so that the fields are usable throughout the year. This includes regular mowing, fertilizing, weed treatments, pesticides, topdressing, line striping, etc. – all of which must be expertly coordinated after and around rainfall events. While the installation of a synthetic turf surface is not itself maintenance free, it is anticipated to be significantly less taxing on the Township and recreation users in this regard. In addition, reducing the need to

perform regular fertilizing, weed treatment and pesticides – will eliminate the potential detrimental impact of these treatments to the water quality of downstream water bodies.

- During winter months, synthetic turf may allow for regular snow removal with proper equipment as recommended by the turf manufacturer. One advantage of the heat retention of synthetic turf is it will warm up faster in cold weather compared to natural grass. Typically, in frost/freezing/snow conditions, if the Township or recreation users remove the snow and allows the turf to absorb the sun's rays, it will be playable well before a natural grass field. This can be beneficial in the event that a snowstorm occurs late in the Fall Sports Season or early in the Spring Sports Season, potentially reducing the need to delay, reschedule and/or cancel recreation activities.

- While the existing fields have sports field lighting, the Township and recreation users are not fully able to realize the benefit of these infrastructure during the late Fall Sports Season and Early Spring Sports Season when they are most needed during limited daylight hours, due to the limiting impact of adverse weather conditions on natural turf. Synthetic turf is more resilient to these adverse weather conditions, which will allow the Township to more fully realize the benefit of its existing sports field lighting infrastructure.

4. **Communication: Please describe how the environmental impacts and potential benefits and risks, including the information presented in this Addendum and the rest of the Environmental Impact Assessment, were shared with the public, particularly during public engagement and also at the required public hearing for the project application. Summarize feedback received specifically on the synthetic turf component of the proposed project, how suggestions were evaluated, and how the project incorporated public feedback.**

   The Township has posted the Synthetic Turf Addendum to its project page to ensure all residents are educated and aware of all environmental and other related factors in regard to the synthetic turf project. The Township conducted a survey and received hundreds of responses regarding the project, making it transparent and clear that the project would be a turf field. Most responses were in favor of the turf and were pleased with its lifetime and flexibility of use. To that end the Township is cognizant of all responses and hopes to address any concerns and take any questions however needed. The Synthetic Turf Addendum and related documents will be presented at the Township's public hearing and the Township will update documentation for all responses and address all comments accordingly.