

**Playing Field Assessment,
Recommendations for Future Field Renovations
and
On-going Maintenance**

*Toronto District School Board
Earl Beatty Junior and Senior Public School
School Community Summary Report
October 21, 2014*

I. Current Field and Site Conditions

The current conditions at Earl Beatty Junior and Senior School were assessed during a visit to the property on May 16, 2014. The following observations were made:

- Dark organic material evident in surface 2-3 cm possibly from past topdressing.
- Topsoil depth of 100-150 mm.
- High level of soil compaction in both the 0-100 mm and 100-300 mm profiles.
- Sports field had a high level of wear and was mostly devoid of vegetation – turf cover was estimated at 15-20%.
- Predominant weed species were prostrate knotweed and plantain – common species found in poorly drained, highly compacted soils.
- No evidence of installed drainage system.
- Existing irrigation system adjusted seasonally.
- Shade impact from trees south of playground.
- Surface soil erosion is collecting in catch basins.
- Small sports field and playground area for school student population.

Table 1. Earl Beatty Soil Physical Analysis

| Soil Component | Percentage |
|----------------------------------|-------------------|
| Clay | 11.3 |
| Silt | 39.2 |
| Total Silt + Clay | 50.5 |
| Sand | 48.6 |
| Organic Matter | 4.5 |
| Fine Gravel - 2 mm | 0.9 |
| Very Coarse Sand - 1 mm | 3.4 |
| Coarse Sand - 0.5 mm | 4.8 |
| Medium Sand - 0.25 mm | 10.0 |
| Fine Sand - 0.15 mm | 10.2 |
| Very Fine Sand - 0.106 mm | 7.5 |
| Very Fine Sand - 0.053 mm | 12.7 |
| Total Fine Sand | 30.4 |

II. Recommendations

The following recommendations have been developed to provide insight into what would be required to develop and maintain a strong, healthy and sustainable natural turf surface on the playing field at Earl Beatty Junior and Senior Public School.

Sports Turf Canada has developed designated athletic field categories, construction specifications and suggested guidelines for permitted use of each category of athletic field. Tables 2 and 3 summarize the field classification system and guidelines for permitted hours of use.

Table 2. Sports Turf Canada Field Classification System

| Design Requirement | Category 1 | Category 2 | Category 3 | Category 4 | Category 5 |
|----------------------|------------|------------|------------|------------|------------|
| Soil (% silt + clay) | < 8.0 | <25 | 25-35 | > 35 | All Soils |
| Sub-surface Drainage | Yes | Yes | Yes | Yes | No |
| Irrigation | Yes | Yes | Optional | Optional | No |
| Light | Yes | Yes | Optional | Optional | No |

Table 3. Sports Turf Canada Field Permitted Use Guidelines

| Category | Permitted Days | Permitted Hrs. Per Day | Consecutive Days of Use | Permitted Hrs. Per Season |
|----------|----------------|------------------------|-------------------------|---------------------------|
| 1* | 90 | 5 | 2 | 450 |
| 2 | 110 | 5 | 3 | 550 |
| 3 | 140 | 5 | 4 | 700 |
| 4 | 180 | 2.5 | 4 | 450 |
| 5 | 180 | 2.5 | 5 | 450 |

**Category 1 fields:*

- *May have significant down time for restoration during the playing season.*
- *Require a high level of on-site supervision and technical knowledge.*
- *Shall have controlled access.*

Factors such as maintenance practices, precipitation, drought, hours of use, time of year, sport and the ages of field users may have a significant impact on field resilience to wear and damage.

The success of any athletic field relies as much on after care (maintenance program) as on the method of construction. The recommendations for field management outlined in this report have been developed to optimize field conditions.

As outlined in Tables 1 and 2, a Category 3 field best meets the requirements of a field that will receive a significant amount of use. The existing topsoil material at Earl Beatty does not meet the requirements for construction of a Category 3 athletic field if used alone. The topsoil will require the addition of sand to meet the soil textural requirements of a Category 3 athletic field.

Given the high values for silt plus clay in the existing topsoil, blending sand with the topsoil will be difficult and require specialized blending equipment.

The following general recommendations are for the renovation and management of the existing field to provide an athletic field that will provide the best possible playing conditions with minimal agronomic inputs. Detailed specifications would be required prior to beginning construction.

A. Recommendations for Construction

1. **Rootzone Material:** Blend the on-site topsoil with an approved coarse sand at a ratio of 60% on-site topsoil and 40% approved coarse sand. The final product shall have a combined value for silt plus clay near 35% and a value for fine plus very fine sand less than 25%. Install the growing medium to a consistent depth of 300 mm.
2. **Drainage:** Install a sub-surface drainage system of corrugated drain tile covered with coarse construction sand.
3. **Irrigation:** Install an automated sub-surface irrigation system with pop-up sprinklers appropriate for use on athletic fields.
4. **Natural Turf Playing Surface:** Sod with a NSGA Number One Grade Kentucky bluegrass sod. The sod should be harvested with an intact growing medium with values for silt plus clay and fine sand the same as, or less than, values reported for the developed rootzone material. If growing conditions are optimal, restrict traffic for a minimum of 6-8 weeks to allow the sod to establish. A longer period of traffic restriction may be required depending upon the time of sodding.

B. Recommendations for On-Going Field Management and Maintenance

1. **Controlled Field Use:**
 - a. Install fencing and locked gates so that the field does not receive greater than 5 hours of play per day for a maximum of 4 consecutive days per week. The recommended annual total for permitted hours of use should not exceed 700 hours.
 - b. Restrict field access under saturated soil conditions to prevent excessive compaction and wear damage.
 - c. Restrict field access in winter months to prevent surface ice formation.

2. **Aeration:** Commencing one year after field renovation.
 - a. Deep tine aeration in May and October.
 - b. Core Aeration in June and September.
 - c. Shatter tine aeration in July and August.

3. **Overseeding:** Following core aeration in June and September, overseed with perennial ryegrass at a rate of 500-600 kg/ha.

4. **Fertility:** Minimum of five applications of fertilizer per growing season.

5. **Topdressing:** Topdressing at the time of core aerating/overseeding as necessary to correct slight depressions, or areas damaged during use. It is essential to use a soil material with similar physical characteristics as the root zone material.

6. **Irrigation:** Irrigate based on observed weather conditions to support germination of overseeded perennial ryegrass and maintain turf growth through periods of drought.

7. **Mowing:** Mow with lightweight equipment at a 5 – 7.5 cm mowing height removing no more than 1/3 of the turf height at each mowing.

Report prepared by:

*Rob Witherspoon, B.Sc.(Agr), M.Sc.
Guelph Turfgrass Institute
University of Guelph
Guelph, Ontario*

*David C. Smith P.Ag, CGCS
DCS Agronomic Services
Gravenhurst, Ontario*

