ATHLETIC FACILITIES CONDITION ASSESSMENT

Roanoke County Public Schools
Roanoke, Virginia

PREPARED FOR:

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Construction Coordinator

Roanoke County Public Schools

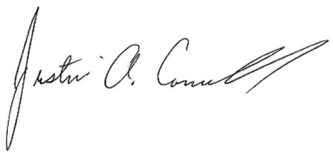
July 30, 2018

Draper Aden Associates
Engineering • Surveying • Environmental Services

DAA Project Number: 17020929-010202

3RD PARTY REVIEW

This Report has been subjected to quality reviews by:



7/30/18

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1.0 EXECUTIVE SUMMARY

The purpose of this study is to assess existing high school outdoor athletic facilities commissioned by Roanoke County Public Schools and review playability, conformance, usage, maintenance needs and safety issues. The following study formalizes the concepts and options presented in the assessment and defines each facilities compliance with NFHS standards and short term and long term recommendations for improving the facilities. The study provides information related to the improvements and/or construction of football, soccer, baseball, softball and practice fields, track oval and field event facilities, improvements to tennis courts and improvements to the existing site infrastructure at Cave Spring High School, Hidden Valley High School, Glenvar High School, Northside High School & Middle School, and William Byrd High School and Middle School. Each site presents unique challenges and opportunities to improve the athletic venues and each surrounding site for the continued success and enjoyment of the students, coaches, administration and supporters of each high school/middle school.

The following exhibits provide an overview of existing facility conditions and potential improvements at each on-campus venue that has been completed through the collaborative efforts of Roanoke County Public Schools, Draper Aden Associates and CHA Consulting, Inc.

The ability to plan the development and improvements to standardize the facilities and provide a premier athletic venue for each high school/middle school is a major goal of this study. Each of the short term and long term recommendations are captured on the following pages.

2.0 AUTHORIZATION

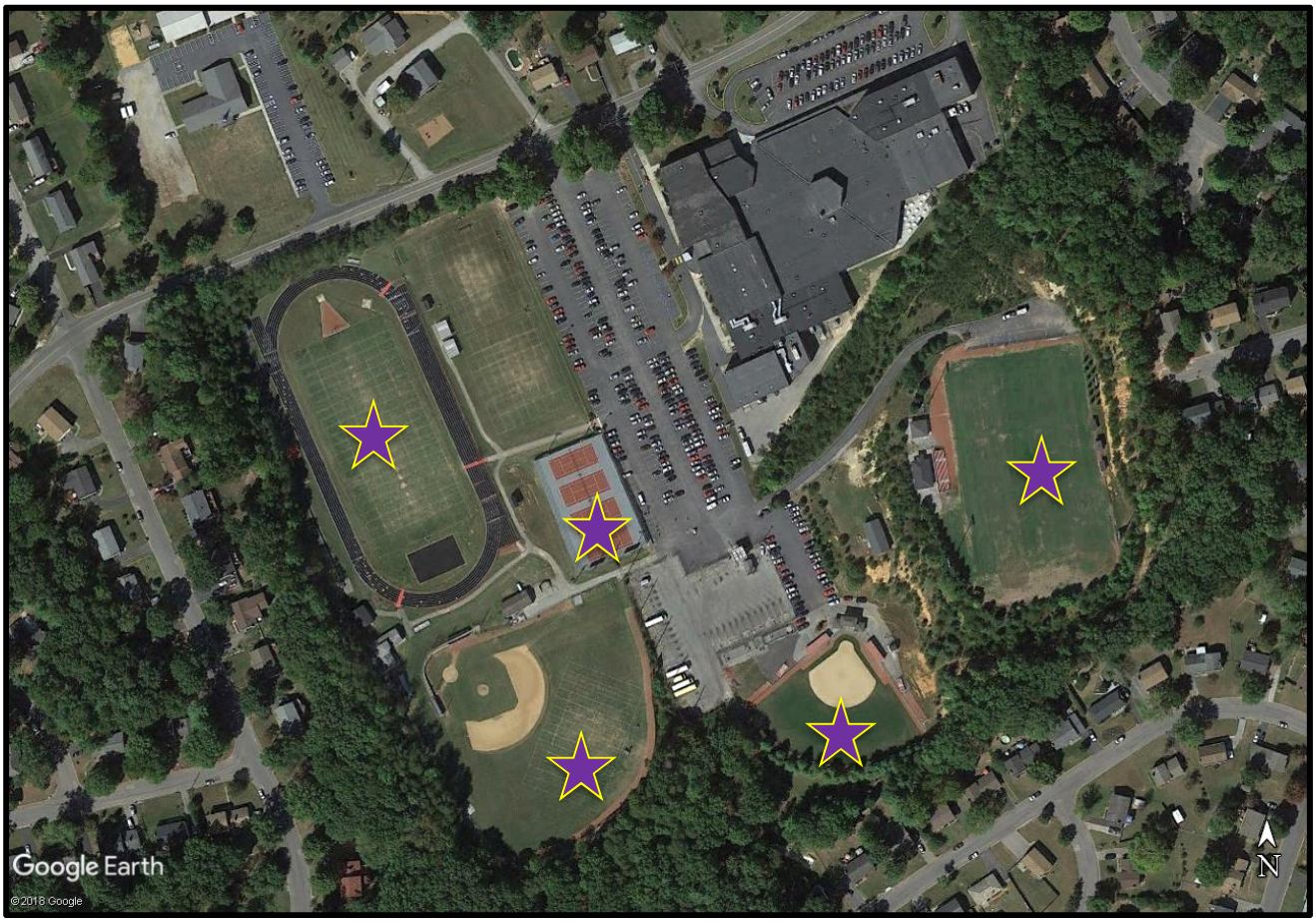
Draper Aden Associates is pleased to present our report of the athletic field assessment completed for the Roanoke County Public School system. This assessment was completed in general accordance with Draper Aden Associates' letter proposal, dated February 13, 2018.

3.0 OBJECTIVE AND SCOPE OF SERVICES

The objective of this study was to generally assess the outdoor athletic facilities at the following schools: Cave Spring High and Middle Schools, Hidden Valley High School, Glenvar High School, Northside High and Middle Schools, and William Byrd High and Middle Schools. Our scope of services included:

- Conducting a site visit at each location documenting field observations as they relate to playability, recommended usage, maintenance condition, and recommended future maintenance activities.
- Perform ASTM F1936-10, Standard Specification for Impact Attenuation of Turf Playing System as Measured in the Field (GMAX Test) for each football, soccer and practice field.
- Compile a final report which summarizes our assessment for each school location.

4.0 CAVE SPRING HIGH SCHOOL



4.1 Soccer Field

- Existing Condition
  - Natural grass field that is mostly covered, however there are some areas where the grass is sparse or barren. These barren areas are located in high wear areas such as, front of goals, penalty kick, center field, and sidelines.
  - The field is crowned in the center but there are some subtle planarity changes across the field. There is evidence that water ponds in these areas.
  - Bleachers seem to be in good condition. DAA recommends an evaluation by a structural engineer
  - End netting behind each goal is sagging.
  - The field average G-MAX tests result was 123 which falls within ASTM maximum allowed of 200.

- Maintenance Needs
  - Repair end netting behind each goal.
  - Aerate, seed, and fertilize the field regularly to provide a good stand of grass and even playing surface.
- Safety Concerns
  - Planarity issues and barren areas could pose tripping or slipping hazards for athletes.
  - Although the G-MAX value of the field was satisfactory, the soil was wet due to significant amount of rain in the area recently. As the field becomes hard and dry during the summer, care should be taken to keep the field subsoil moist in order to maintain a safe G-MAX value.
- Recommendations
  - Short Term:
    - Sand dress the low areas causing planarity issues to create a smooth surface. This will also temporarily help drainage.
  - Long Term:
    - Install perimeter drains around the field to collect storm water and move it off site.
    - Regrade the field with laser grading equipment to ensure acceptable planarity.
    - Install sand based or sand cap system with new sod or install a synthetic turf surface. Both of these options will provide a sustainable high quality playing surface.

4.2 Practice Field (Inside Track)

- Existing Condition
  - Natural grass field that is mostly covered, however there are a few areas where the grass is sparse or barren. These barren areas are located in high wear areas such as, front of goals, penalty kick, center field, and sidelines.
  - The field is crowned in the center with a large drainage ditch around the perimeter of the field.
  - At the south east corner of the field there is a large drainage swale within the field of play.
  - Perimeter fence requires repair in some locations.

- The field average G-MAX tests result was 69 which falls within ASTM maximum allowed of 200.
- A net sleeve is installed at edge of field.

- Maintenance Needs
  - Make repairs to perimeter fence
  - Aerate, seed, and fertilize the field regularly to provide a good stand of grass and even playing surface.
- Safety Concerns
  - Net sleeve location could be a safety hazard if a player fell on it.
  - Although the G-MAX value of the field was satisfactory, the soil was wet due to significant amount of rain in the area recently. As the field becomes hard and dry during the summer, care should be taken to keep the field subsoil moist in order to maintain a safe G-MAX value.
- Recommendations
  - **Short Term:**
    - Sand dress the low areas causing planarity issues to create a smooth surface. This will also temporarily help drainage.
  - **Long Term:**
    - Install perimeter drains around the field to collect storm water and move it off site. This will alleviate the large drainage ditch around the perimeter of the field.

4.3 Softball Field

- Existing Condition
  - Field, fence, and bleachers appear to be in very good condition. DAA recommends an evaluation of the bleachers by a structural engineer.
  - Maintenance staff mentioned some drainage issues outside of the field behind the third base dugout and also in parking lot behind first base dugout.
- Maintenance Needs
  - No maintenance needs at this time.
- Safety Concerns
  - No safety concerns at this time.
- Recommendations

- **Short Term:**
  - Perform a storm water analysis to address drainage issues outside of the field.
- **Long Term:**
  - Implement recommendations from the storm water analysis

4.4 Baseball Field

- Existing Condition
  - Natural grass field in good condition.
  - Standing water in each dugout
  - Set of bleachers on left field side of home plate require repair.
- Maintenance Needs
  - Repair set of bleachers on left field side of home plate.
  - Aerate, seed, and fertilize the field regularly to provide a good stand of grass and even playing surface.
- Safety Concerns
  - Steep slope along foul/fair line on right side.
  - Hole in backstop netting at corner of right field dugout.
  - No fence in front of either dugout.
- Recommendations
  - **Short Term:**
    - Address the drainage issues at each dugout utilizing a French drain system.
    - Repair backstop netting at corner of right field dugout.
  - **Long Term:**
    - Install a fence in front of each dugout. Height of the fence based on coach's preference.
    - Install a fence at the toe of the slope along right field foul line.

4.5 Track (6 Lane Oval, 8 Lane Straight)

- Existing Condition
  - Surface
    - 3/8" latex surfacing, good condition, 8 years old

- Lane striping in good condition
- Surfacing at long/triple jump runways in good condition
- Surfacing at pole vault and high jump in good condition

- Asphalt
  - Asphalt slopes from the outside to inside
  - An asphalt overlay appears to have been installed within the last 5 years
  - Very thick pavement section on outside edge
  - Asphalt at long/triple jump in good condition
  - Asphalt at pole vault and high jump in good condition
- Perimeter
  - No curbs, stone/dirt edge around outside and inside perimeter
  - 4-6" high lawn/soil on both outside and inside
  - No drain at inside perimeter, this could cause ponding inside Lane 1 and at field edge.
- Oval and field Event conformance with NFHS standards
  - We attempted to determine the actual measure line length of the track oval by overlaying an aerial image with an AutoCAD drawing of a best fit track oval and believes it to be a 400m oval with a 104.43' radius. Without record drawings or a digital survey, we can't verify this with 100% certainty and recommends that the school verify the measure line distance with record documents or by hiring a surveyor with track and field experience.
  - The track only has 6 lanes which may limit the potential to host meets.
  - Shot put pad & circle and discus cage & netting in good condition.
  - Shot put landing area stone is lower than circle elevation.
  - Football goal post is likely obstructing possible shot put throwing records

- Maintenance Needs
  - Debris including but not limited to grass/grass clippings, dirt and tree litter must be kept clear from the track and field events to extend longevity.
- Safety Concerns
  - Inside edge elevation difference could be a safety issue, especially at common finish line.

- Shot put landing area extends into football goal post, could be very dangerous for football players to step onto different surface and/or trip over landing area border curbs.
- Football goal post only 50' from front of shot put circle
- Large swale in grass field at south east corner

- Recommendations
  - **Short Term:**
    - Keep debris/grass clippings/leaf litter etc. off track surfacing. (On-going maintenance)
    - Bring shot put landing area material up to flush with throwing circle to be in conformance with NFHS.
  - **Long Term:**
    - Install trench drain along sides of field at inside edge of track
    - Remove and replace synthetic surfacing within approximately 3-5 years
    - Relocate or reorient shot put landing area to avoid football goal post.
    - Regrade the field with laser grading equipment to ensure acceptable planarity.

4.6 Tennis Courts

- Existing Condition
  - Surface
    - Surfacing in good condition, above average
  - Asphalt
    - Asphalt contains approximately 1,000 linear feet of long linear cracks between ¼" – ½" wide. The cracks are mostly flat. This is a common condition for tennis courts.
  - Fence
    - Galvanized fencing 10' high in good condition
    - No bottom or mid rail, tension wire only
    - Perimeter fence post foundations starting to crack and heave slightly.
  - Net/Post
    - Good condition
    - Mid net anchor foundation heaving slightly

        - Net post foundations starting to crack, but is not an immediate concern.

- Maintenance Needs
    - Debris including but not limited to grass/grass clippings, dirt and tree litter must be kept clear from tennis court edges to extend longevity.
- Safety Concerns
    - No visible immediate safety concerns.
- Recommendations
    - **Short Term:**
        - Patch cracks with a layered crack repair system and resurface to extend the longevity of the courts. It is more cost effective to repair the cracks at their current state (<1/2" wide gap) before the cracks become larger and unrepairable. The layered crack repair system is typically effective for 3-5 years before cracks will reoccur.
    - **Long Term:**
        - Remove and replace the asphalt pavement in approximately 5-7 years. The extent of the removal will depend on the existing quality and depth of asphalt and stone. Core testing would be required to determine condition if record drawings don't exist.

5.0 CAVE SPRING MIDDLE SCHOOL (BOGLE STADIUM)

5.1 Football/Soccer Field

- Existing Condition
  - Synthetic turf surface (Field Turf Duraspine). The field was installed in 2007 making its age 11 years.
  - The infill material is a mixture sand and rubber. The depth of infill ranged from approximately 1.25" – 1.5" with pile height approximately 2.0".
  - Fibers are laying over and are starting to coil.
  - The penalty kick line on the south end of the field been replaced but is coming loose. This area needs to be repaired.
  - A repair was previously made on the north end of the field at approximately the 2 ½ yard line.
  - There were slight planarity changes near midfield.
  - Signs of weeds/grasses growing along the edge of the synthetic turf field.
  - The average G-MAX test result for the entire field was 140 which falls within the ASTM maximum allowed of 200.
  - Bleachers seem to be in good condition. DAA recommends an evaluation by a structural engineer.

- Fence is in good condition

- Maintenance Needs
  - Continue to groom the field as per manufacturer's instructions.
  - Spray weed killer along the edge of the synthetic turf.
  - Perform G-MAX testing on an annual basis.
- Safety Concerns
  - Although the G-MAX values were within the maximum allowed range, the values are on the higher end of the range. A lower G-MAX value will provide a higher level of safety for the athletes.
- Recommendations
  - **Short Term:**
    - Repair the penalty kick line on the south end of the field.
  - **Long Term:**
    - Plan to replace the synthetic turf field within the next 2 years. Contact Draper Aden Associates prior to replacing the existing turf to discuss school needs and product options.

6.0 NORTHSIDE HIGH SCHOOL & MIDDLE SCHOOL

6.1 Football Field (Stadium)

- Existing Condition
  - Natural grass field that is mostly covered, however there are a few areas where the grass is sparse or barren. These barren areas are located in high wear areas such as, front of goals, penalty kick, center field, and sidelines.
  - Perimeter fence requires repair in some locations.
  - The field average G-MAX tests result was 63 which falls within ASTM maximum allowed of 200.
  - The fence in front of the home side bleachers requires repair in some locations.
  - Asphalt in front on visitor side bleachers requires repair in one location.
  - Parking lot adjacent to tennis courts and the asphalt walk entering the stadium from this parking needs asphalt and subgrade repair.

- Maintenance Needs
  - Make repairs to perimeter fence and fence in front of home side bleachers.
  - Aerate, seed, and fertilize the field regularly to provide a good stand of grass and even playing surface.
- Safety Concerns
  - Home side bleacher fencing
  - Although the G-MAX value of the field was satisfactory, the soil was wet due to significant amount of rain in the area recently. As the field becomes hard and dry during the summer, care should be taken to keep the field subsoil moist in order to maintain a safe G-MAX value.
- Recommendations
  - **Short Term:**
    - Sand dress the low areas that are causing planarity issues to create a smooth surface. This will also temporarily help drainage.
  - **Long Term:**
    - Install perimeter drains around the field to collect storm water and take it off site.
    - Regrade field and install new Bermuda sod over a sand based system or install a new synthetic surface.

6.2 Baseball Field

- Existing Condition
  - The natural grass field is mostly covered and looks to be in good condition.
  - Safety netting along the right field line to protect spectators requires repair.
- Maintenance Needs
  - Make repairs to safety netting
  - Aerate, seed, and fertilize the field regularly to provide a good stand of grass and even playing surface.
- Safety Concerns
  - Safety netting along right field line
- Recommendations
  - **Short Term:**
    - Extend safety netting from right field dugout to the backstop.

- **Long Term:**
  - Upgrade the dugouts and bleachers for spectators.
  - Install sports lighting for the field.

6.3 Softball Field

- Existing Condition
  - Four natural grass fields in a clover leaf layout. Fields, fencing and surrounding areas are in great condition.
- Maintenance Needs
  - No immediate needs
- Safety Concerns
  - No immediate safety concerns
- Recommendations
  - **Short Term:**
    - Provide an outfield fence on the northern most field
  - **Long Term:**
    - Install sports lighting on all four fields

6.4 Practice Field/Soccer Field

- Existing Condition
  - Natural grass field that is mostly covered, however there are a few areas where the grass is sparse or barren. These barren areas are located in high wear areas such as, front of goals, penalty kick, center field, and sidelines.
  - There were signs of ponding water in low spots throughout the field as a results of numerous planarity changes across the field.
  - Perimeter fence requires repair in some locations.
  - The field average G-MAX tests result was 64 and 90 which falls within ASTM maximum allowed of 200.
  - Limited end netting behind goals on the south side of the field
- Maintenance Needs
  - Make repairs to perimeter fence.
  - Aerate, seed, and fertilize the field regularly to provide a good stand of grass and even playing surface.

- Safety Concerns
  - No immediate safety concerns
- Recommendations
  - **Short Term:**
    - Install sports netting along the entire southern side of the perimeter of the field.
    - Sand dress the low areas that are causing planarity issues to create a smooth surface. This will also temporarily help drainage.
  - **Long Term:**
    - Regrade field and install new Bermuda sod over a sand based system or install a new synthetic surface.

6.5 Track (6 Lane)

- Existing Condition
  - Surface
    - 3/8" latex surfacing, good condition, no delamination of surfacing
    - Lane striping in good condition
    - High jump in good condition with a possible bird bath parallel to goal post.
    - Surfacing at pole vault in good condition. There were no lane striping and no border curbs.
  - Asphalt
    - Asphalt in good condition
    - Asphalt is very thick along outside perimeter edge. This edge is possibly from a large overlay or a correction of track slope.
  - Perimeter
    - No curbs along outside edge. Outside track edge is approximately 4"-6" higher than adjacent lawn.
    - 12" wide concrete curb on inside edge in good condition.
    - No drain at inside perimeter, this could cause ponding inside Lane 1 and at field edge.
    - Consistent dimensions off lane 1 and off lane 6 in most areas
    - Gate at north side and south side of visitor bleacher has poor accessibility due to the large change in elevation.

- Perimeter fence is 42" high, galvanized and in overall fair condition.

- Oval and field Event conformance with NFHS standards
  - We attempted to determine the actual measure line length of the track oval by overlaying an aerial image with an AutoCAD drawing of a best fit track oval and believes it to be a 400m oval with a 104.43' radius. Without record drawings or a digital survey, we can't verify this with 100% certainty and recommends that the school verify the measure line distance with record documents or by hiring a surveyor with track and field experience.
  - The track only has 6 lanes which may limit the potential to host meets.
  - Discus ring is very old and not attached to concrete pad.
  - Discuss sector has practice football goal post inside the landing sector.
  - Shot put landing area sits at a lower elevation and is not flush with the shot put circle.

- Maintenance Needs
  - Debris including but not limited to grass/grass clippings, dirt and tree litter must be kept clear from the track and field events to extend longevity.

- Safety Concerns
  - Limits outside of lane 6 diminish dramatically at start of sprint straight in southeast corner. The large elevation drop off could be potentially dangerous.
  - There is exposed concrete approximately 24" in size at the back of the pole vault landing area. Entire pad should be covered.
  - Discus cage netting has significant sag as much as 3 feet in some areas.
  - Large swale in grass field at south east corner

- Recommendations
  - **Short Term:**
    - Provide lane striping for pole vault runway 4' wide (2" wide white stripes)
    - Remove access to gates just north and south of visitor's bleachers
    - Poor fence sections should be repaired.
    - Shot put landing area should be supplemented with additional material, groomed and flush with shot put circle.
    - Cover back of the concrete pad at pole vault with additional padding

- Discus sector should be rotated to avoid goal post being in landing area.
- Discus ring should be replaced.
- Discus cage netting shall be raised to limit sag.
- Fill in depressed lawn area outside lane 6 in north turn at the intersection with sprint chute with stone or topsoil/seed to avoid large drop-off.

- **Long Term:**
  - Install trench drain along sides of field off inside edge of concrete curb
  - Remove and replace synthetic surfacing within approximately 2-5 years

6.6 Tennis Courts

- Existing Condition
  - Surface
    - Surfacing in very poor condition. Surfacing is mostly gone on tree-side of the courts
  - Asphalt
    - Asphalt in very poor condition. Large cracks greater than 2" in some areas. These present many tripping hazards, especially on west side and south end of the courts.
    - Previous patches have failed.
  - Fence
    - Fencing in fair condition
    - No bottom rail
    - Perimeter fence post foundations starting to crack and heave slightly.
  - Net/Post
    - 3 nets in fair condition, 1 net in poor condition and should be replaced.
    - Net posts in poor condition
    - Net post foundations are settling and heaving.
- Maintenance Needs
  - Debris including but not limited to grass/grass clippings, dirt and tree litter must be kept clear from tennis court edges to extend longevity.

- Trees overhanging the courts should be trimmed or removed to limit disturbance of tennis court surfacing.
- The shrub inside limits in southeast corner should be removed.

- Safety Concerns
  - A depressed gap approximately 12″ wide and 4″ deep on east side of court by surfacing limits and fence.
  - Some cracks in court surfacing could be potential tripping hazards.
- Recommendations
  - **Short Term:**
    - Trim or remove trees overhanging the courts on the south end.
    - Address large drop-off along east side of courts between surfacing limits and fence
    - Nets need to be replaced with the north court being the most critical
    - New net posts should be installed
    - Asphalt should be removed and replaced along with new surfacing and striping. This should be performed within 1 year.
  - **Long Term:**
    - New perimeter fencing

7.0 WILLIAM BYRD HIGH SCHOOL & MIDDLE SCHOOL

7.1 Football Field (Stadium)

- Existing Condition
  - Synthetic grass surface consisting of slit film fibers installed in 2017. Field is in good condition.
  - The infill material is a mixture sand and rubber. The depth of infill averaged approximately 1.75" with pile height approximately 2.25".
  - The field average G-MAX tests result was 127 which falls within ASTM maximum allowed of 200.
  - Fence and bleachers in good condition. DAA recommends an evaluation of the bleachers by a structural engineer.
- Maintenance Needs
  - Continue to groom the field as per manufacturer's instructions.
  - Perform G-MAX testing on an annual basis.
- Safety Concerns

- No immediate safety concerns

- Recommendations
  - **Short Term:**
    - Continue maintenance as per manufacturer's instructions
  - **Long Term:**
    - Field replacement should be expected in 8-10 years.

7.2 Softball Field

- Existing Condition
  - The natural grass field is mostly covered and looks to be in great condition.
  - No fencing along left field line to separate players from spectators.
- Maintenance Needs
  - Trim trees along perimeter fence down right field line
  - Aerate, seed, and fertilize the field regularly to provide a good stand of grass and even playing surface.
- Safety Concerns
  - No immediate concerns at this time
- Recommendations
  - **Short Term:**
    - Extend safety netting further down right field line to protect against lost balls.
  - **Long Term:**
    - Extend small retaining wall down the left field line with padding to provide separation from spectators and players without altering spectator views.

7.3 Practice Field

- Existing Condition
  - Natural grass fields. Field and surrounding areas in good condition.
- Maintenance Needs
  - Aerate, fertilize, and over seed as needed.
- Safety Concerns
  - No immediate safety concerns

- Recommendations
  - **Short Term:**
    - Replace goal posts with newer set back style.
  - **Long Term:**
    - Regrade field and install new Bermuda sod over a sand based system or install a new synthetic surface.

7.4 Baseball Field

- Existing Condition
  - Natural grass field in good condition.
  - Fence in front of top tier bleachers is sagging in one location.
- Maintenance Needs
  - Make repairs to fence in front of top tier bleachers.
  - Aerate, seed, and fertilize the field regularly to provide a good stand of grass and even playing surface.
- Safety Concerns
  - Foul balls entering neighboring properties on first base side.
- Recommendations
  - **Short Term:**
    - Extend safety netting further along right field line to protect residence with swimming pool.
  - **Long Term:**
    - Regrade field and install new Bermuda sod over a sand based system or install a new synthetic surface.

7.5 Track (6 Lane)

- Existing Condition
  - Surface
    - Surfacing in very good condition. Feels like a sandwich type surfacing system with excellent feel.
    - High jump approach is synthetic turf without track surfacing, which is uncharacteristic of typical high jump areas
  - Asphalt

- Asphalt in very good condition
- Track seems to slope slightly from outside to inside. Overall track is very flat.

- Perimeter
  - Inner concrete curb/turf, asphalt walk
  - Concrete curb along inner perimeter has a couple smaller cracks
  - Curb is breaking at end near 10m short of common finish line
  - No inside trench drain, may cause ponding inside Lane 1 and at field edge
  - 42" black outside perimeter fence
  - Fence is a little close (<3') to outside lane 6 at the northwest turn
- Oval and field Event conformance with NFHS standards
  - We attempted to determine the actual measure line length of the track oval by overlaying an aerial image with an AutoCAD drawing of a best fit track oval and believes it to be a 400m oval with a 104.43' radius. Without record drawings or a digital survey, we can't verify this with 100% certainty and recommends that the school verify the measure line distance with record documents or by hiring a surveyor with track and field experience.
  - Track is only 6 lanes, may limit potential to host meets
  - Runways look very good
  - No shot put circle ring (school received 2 discus rings during construction project instead of one of each)
  - Shot put landing material is lower than the circle elevation
  - Landing area is short in terms of length. It appears shot put records could not be broken here within the current landing area limits
  - Shot put curbing is heaving in areas
  - Discus cage & netting in fair condition
  - Netting is not providing full coverage and is sagging

- Maintenance Needs
  - Debris shall be kept clear from track and field events to extend longevity
  - South side of track has grass between track and fence which is difficult to maintain
- Safety Concerns

- No visible immediate safety concerns

- Recommendations
  - **Short Term:**
    - Install an appropriate shot put circle ring on the concrete pad
    - Supplement shot put landing area material to be flush with circle elevation
    - Remove lawn area between track and fence along North and South sides of track and replace with either stone or asphalt/concrete
  - **Long Term:**
    - Install trench drain at inside perimeter of track oval to help with drainage
    - Remove turf at high jump approach and replace with asphalt pavement and surfacing

7.6 Tennis Courts

- Existing Condition
  - Surface
    - Surfacing is not in great condition, has some fading and is very streaky, areas of delamination/flaking
  - Asphalt
    - Asphalt in poor condition, a lot of cracking (1/4"-1")
    - Large crack at entrance gate at northwest corner of southern set of courts
  - Fencing
    - Fencing in fair condition, 10' high galvanized
    - No bottom rail or mid rail
    - Entrance gate at northwest corner of southern courts is missing latch
  - Net/Post
    - Nets in fair condition, has some wearing
    - Net posts in fair condition, post cranks are rusting
    - Center net anchor foundation heaving
    - Net post foundations heaving (± 1/2")
- Maintenance Needs

- Debris including but not limited to grass/grass clippings, dirt and tree litter must be kept clear from tennis court edges to extend longevity.

- Safety Concerns
  - Some cracks in court surfacing starting to become potential tripping hazards.
- Recommendations
  - **Short Term:**
    - Install latch at entry gate at Northwest corner of southern courts
    - We recommend patching the cracks with a layered crack repair system and resurfacing to extend longevity of the courts. It is better to repair the cracks at their current state prior to getting larger and unrepairable. The layered crack repair system is typically affective for 3-5 years before cracks reoccur
  - **Long Term:**
    - Reconstruct courts with new asphalt pavement and new nets/posts within approximately 3-5 years. The extent of this removal will depend on the quality and quantity or stone subbase material beneath the asphalt
    - Install new perimeter fencing with bottom and mid rail

8.0 GLENVAR HIGH SCHOOL & MIDDLE SCHOOL

8.1 Football Field (Stadium)

- Existing Condition
  - Natural grass field that is mostly covered, however there are a few areas where the grass is sparse or barren. These barren areas are located in high wear areas such as, front of goals, penalty kick, center field, and sidelines.
  - There is a large crown on this field with numerous planarity changes. The planarity changes causes poor drainage.
  - There are no drop inlets around the perimeter of the field.
  - The field average G-MAX tests result was 89 which falls within ASTM maximum allowed of 200.
  - Some areas of perimeter fencing is missing the fabric
  - No handrails running up the stairs on the home side bleachers. DAA recommends an evaluation by a structural engineer.
  - Apparent wash out at the base of the visiting bleachers

- Maintenance Needs
  - Aerate, seed, and fertilize the field regularly to provide a good stand of grass and even playing surface.
  - Make repairs to perimeter fencing
- Safety Concerns
  - Lack of handrails on home side bleachers
  - Planarity changes across the field could pose a safety issue
- Recommendations
  - **Short Term:**
    - Sand dress the low areas that are causing planarity issues to create a smooth surface. This will also temporarily help drainage.
    - Install handrails on the home side bleachers.
  - **Long Term:**
    - Install perimeter drains around the field to collect storm water and take it off site.
    - Regrade field and install new Bermuda sod over a sand based system or install a new synthetic surface within the next 1-2 years.

8.2 Softball Field

- Existing Condition
  - The natural grass field is mostly covered and looks to be in good condition.
  - Areas of fence along the right field side need repair.
- Maintenance Needs
  - Repair fence in damaged areas
  - Aerate, seed, and fertilize the field regularly to provide a good stand of grass and even playing surface.
- Safety Concerns
  - No immediate concerns at this time
- Recommendations
  - **Short Term:**
    - Install a taller fence in front of bleachers to provide additional safety to spectators.
  - **Long Term:**

- Regrade field and install new Bermuda sod.
- Install sports field lighting

8.3 Practice Field

- Existing Condition
  - Natural grass field that is sporadically covered, with numerous areas where the grass is sparse or barren.
  - There were signs of ponding water in low spots throughout the field as a results of numerous planarity changes across the field.
  - Perimeter fence requires repair in some locations.
  - The field average G-MAX tests result was 122 which falls within ASTM maximum allowed of 200.
  - Steep hill as the access point for the field
- Maintenance Needs
  - Aerate, seed, and fertilize the field regularly to provide a good stand of grass and an even playing surface.
- SAFETY CONCERNS
  - Although the average G-MAX value fell within ASTM requirements, 2 test points in the field tested above 140. These areas are approaching levels of concern and will only get worse through the summer and drier time of year.
  - Difficult access up the hill to the field
- Recommendations
  - **Short Term:**
    - Improve access to the field
  - **Long Term:**
    - Regrade field and install new Bermuda sod.

8.4 Baseball Field

- Existing Condition
  - Natural grass field that is in good condition.
  - Fence along left field line needs is sagging and overrun with weeds/brush.
- Maintenance Needs
  - Make repairs to fence along left field line.

- Aerate, seed, and fertilize the field regularly to provide a good stand of grass and even playing surface.

- Safety Concerns
  - No immediate safety concerns
- Recommendations
  - **Short Term:**
    - Make repairs to fencing where required
  - **Long Term:**
    - Regrade field and install new Bermuda sod over a sand based system or install a new synthetic surface.

8.5 Soccer Field

- Existing Condition
  - Natural grass field that is mostly covered, however there are a few areas where the grass is sparse or barren. These barren areas are located in high wear areas such as, front of goals, penalty kick, center field, and sidelines.
  - There is a slight crown and signs of ponding water in low spots throughout the field as a results of numerous planarity changes across the field.
  - No perimeter fence on parking lot side of the field
  - The field average G-MAX tests result was 92 which falls within ASTM maximum allowed of 200.
  - No end netting behind goals
  - Weeds and brush are overgrowing the perimeter of the field
- Maintenance Needs
  - Remove weeds/brush from perimeter areas
  - Aerate, seed, and fertilize the field regularly to provide a good stand of grass and even playing surface.
- Safety Concerns
  - A sink hole outside of the perimeter fence is a trip hazard
- Recommendations
  - **Short Term:**
    - Install sports netting behind the goals

- Sand dress the low areas that are causing planarity issues to create a smooth surface. This will also temporarily help drainage.
- Extend perimeter fence on parking lot side

- **Long Term:**
  - Regrade field and install new Bermuda sod over a sand based system or install a new synthetic surface.

8.6 Track (6 Lane)

- Existing Condition
  - Surface
    - No surfacing, asphalt only track
    - No surfacing on high jump areas
    - Surfacing at long/triple jump is very poor
    - Some areas are double layered, some staggered, many holes, etc.
    - Rubber mats on long/triple jump runways not adhered
  - Asphalt
    - Asphalt has quite a few cracks around the oval, up to ¾" wide and some vertical settlement
    - East apex of track has settling issues, cracks & patches
    - Lanes 3 & 4 have consistent cracking
    - Planarity looks to be suspect in areas
    - There are some bad low areas in southwest corner of sprint
    - Shot put pad (conc.) Is in state of disrepair
    - Cracking in high jump area
    - Long/triple jump asphalt in poor condition
    - Large crack across track at 100m sprint start (5m ahead of)
  - Perimeter
    - No Curbs along inside or outside perimeter
    - Outside elevated above adjacent lawn
    - No drain at inside perimeter, this could cause ponding inside Lane 1 and at field edge
    - Grass is starting to intrude on inside & outside edge of track

        - Slopes outside to inside
        - Fencing, green painted, in fair condition, some fading
        - Fence missing around west turn and east turn, only on straight-aways
    - Oval and field Event conformance with NFHS standards
        - We attempted to determine the actual measure line length of the track oval by overlaying an aerial image with an AutoCAD drawing of a best fit track oval and believes it to be a 400m oval with a 104.43' radius. Without record drawings or a digital survey, we can't verify this with 100% certainty and recommends that the school verify the measure line distance with record documents or by hiring a surveyor with track and field experience.
        - Track is only 6 lanes, this may limit the potential to host meets
        - Shot put pad 3-4" higher than landing sector, not in conformance
        - Long/Triple Jump in very poor condition
        - High Jump may slope downhill, would have to confirm with as-built plans
        - Discus cage/netting in fair condition
        - Concrete pad starting to deteriorate
- Maintenance Needs
    - Grass is encroaching on Lane 1 and Lane 6 at Northwest turn (200M Start)
    - Shot Put landing area needs grooming and more material to be brought up to level
    - Sand Pits need serious attention
    - Low areas, not level & too close to the edge of soccer (should be minimum 10' from playing limits)
    - Shot put toe board to be replaced
- Safety Concerns
    - Shot put pad surface is deteriorating, loose granular material could pose a safety concern
    - Sand pits and long/triple jump runway surfacing need immediate attention, both pose safety risks as tripping hazards
- Recommendations
    - **Short Term:**

- Cut back lawn areas encroaching on inside and outside edges of track oval (on-going maintenance)
- Remove and replace the Long/Triple Jump runway and sand pits, preferably to a location at least 10' from the edge of any adjacent field/sport edge and at least 1meter from the edge of Lane 1.
- Construct a pole vault runway (if desired) possibly in the Southeast D-Zone or outside the track limits
- Due to the number and extent of cracking in the asphalt, we recommend removing and replacing the asphalt pavement on the track oval and installing a rubberized track surfacing similar to the other tracks in the county. The extent of the removal would be based on the quality of the existing subbase material and depth.
- Remove and replace the shot put pad and circle
- Supplement Shot Put landing area with extra material and groom as appropriate.
- Adjust discus netting
- Install fencing around the East and West turns around the track to match the sides

○ **Long Term:**

- The removal and replacement of the asphalt track oval and field events could be done in 2-3 years but we recommend it be done sooner due to its current condition
- Remove and replace all existing perimeter fencing and add along both turns
- Install trench drain at inside perimeter of track. This should be done when the track is reconstructed
- Remove and replace discus concrete pad and circle

8.7 Tennis Courts

♦ Existing Condition

○ Surface

- Surfacing in fair condition - very thin, can see sweeping strokes, & areas of delamination and surfacing flaking off. Surfacing could be completely faded off within a few years

- Asphalt
  - Asphalt has long linear cracks between ¼"- 1" wide at mid-court, and halfway at each court
  - 3 Eastern courts are the worst
  - Bad depression at Western court net
  - Settled about 1" around West net post creating a tripping hazard
  - Very few visible bird baths
- Fence
  - Good condition 10' high galvanized fencing
  - No bottom or mid rail (tension wire only)
- Net/Post
  - Nets and posts are older but in fair condition

♦ Maintenance Needs

- Debris including, but not limited to grass/grass clippings, dirt and tree litter must be kept clear from tennis court edges and perimeter fencing to extend longevity
- Clean out organic matter from cracks
- Looks as though equipment used to possibly clean/sweep surface is scraping the actual surfacing off.

♦ Safety Concerns

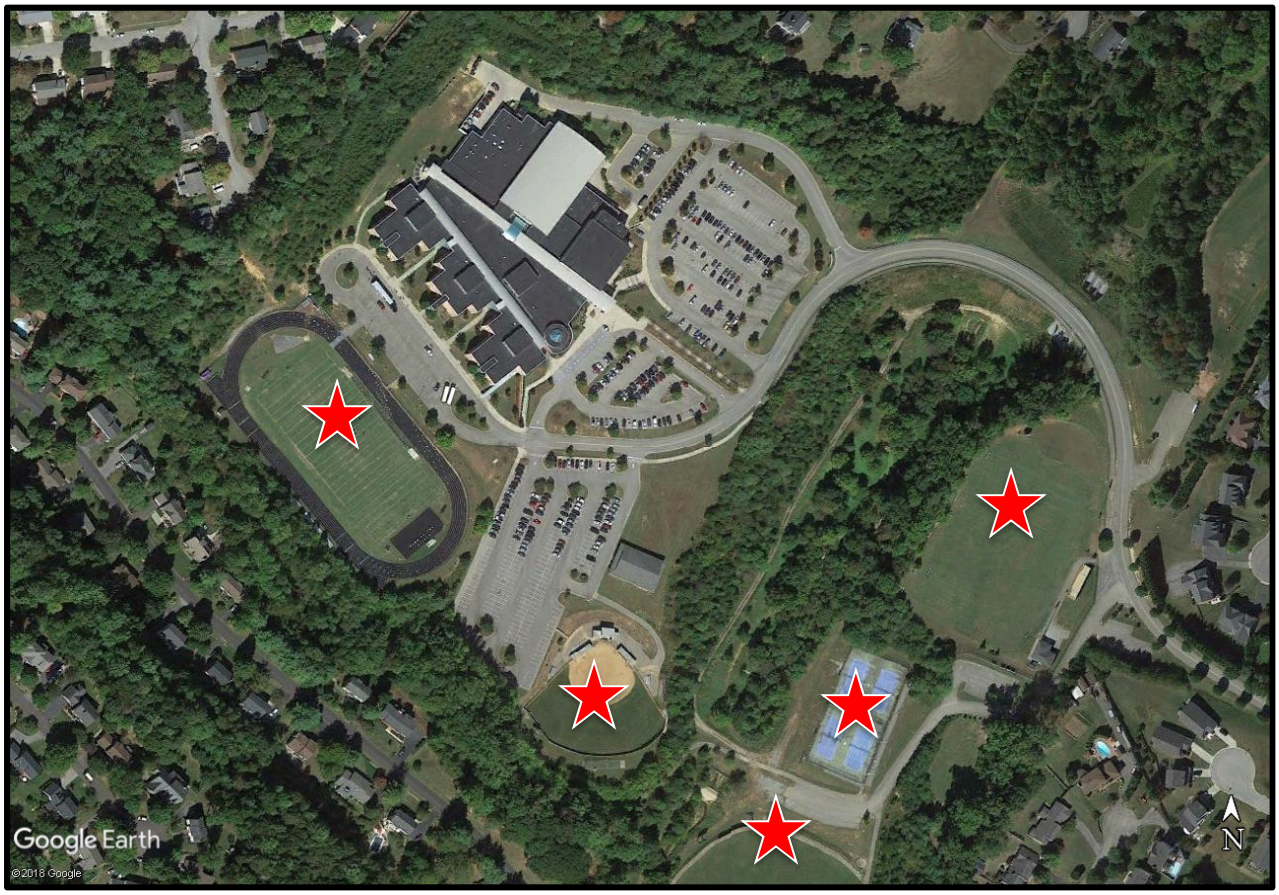
- No visible immediate safety concerns except 1" depression at furthest West net post.

♦ Recommendations

- **Short Term:**
  - We recommend patching the cracks with a layered crack repair system and resurfacing to extend longevity of the courts. It is better to repair the cracks at their current state prior to allowing them to get larger and become unrepairable. The layered crack repair system is typically affective for 3-5 years before cracks reoccur. This repair should include a larger repair at the 1" depression in the West court. The depressed area should be saw cut out and replaced with new asphalt.
  - Keep debris/grass clippings/organic matter away from outer edges of courts and out of cracks (On-going maintenance)
- **Long Term:**

- Reconstruct courts with total removal and replacement of asphalt with new surfacing and new nets within approximately 3-5 years.

9.0 HIDDEN VALLEY HIGH SCHOOL



9.1 Practice Field (Inside Track)

- Existing Condition
  - Natural grass field that is mostly covered, however there are areas where the grass is sparse or barren. These barren areas are located in high wear areas such as, front of goals, penalty kick, center field, and sidelines.
  - There is a large crown on this field with a few subtle planarity changes.
  - There are no drop inlets around the perimeter of the field.
  - The field average G-MAX tests result was 112 which falls within ASTM maximum allowed of 200.
- Maintenance Needs
  - Aerate, seed, and fertilize the field regularly to provide a good stand of grass and even playing surface.

- Safety Concerns
  - No immediate safety concerns at this time.
- Recommendations
  - **Short Term:**
    - Sand dress the low areas that are causing planarity issues to create a smooth surface. This will also temporarily help drainage.
  - **Long Term:**
    - Install perimeter drains around the field to collect storm water and take it off site.
    - Regrade field and install new Bermuda sod over a sand based system or install a new synthetic surface.

9.2 Softball Field

- Existing Condition
  - The natural grass field is mostly covered and looks to be in good condition.
  - Small repair needed on a backstop pole
- Maintenance Needs
  - Repair fence in damaged area
  - Aerate, seed, and fertilize the field regularly to provide a good stand of grass and even playing surface.
- Safety Concerns
  - No immediate concerns at this time
- Recommendations
  - **Short Term:**
    - Repair backstop and fence where required.
  - **Long Term:**
    - Regrade field and install new Bermuda sod.
    - Install sports field lighting

9.3 Baseball Field

- Existing Condition
  - Under construction from recent flood damage.

- Maintenance Needs
  - Unknown at this time
- Safety Concerns
  - No immediate safety concerns
- Recommendations
  - **Short Term:**
    - Repair flood damaged areas
  - **Long Term:**
    - Regrade field and install new Bermuda sod over a sand based system or install a new synthetic surface.

9.4 Soccer Field

- Existing Condition
  - Natural grass field that is mostly covered, however there are areas where the grass is sparse or barren. These barren areas are located in high wear areas such as, front of goals, penalty kick, center field, and sidelines.
  - There is a slight crown and signs of ponding water in low spots throughout the field as a results of numerous planarity changes across the field.
  - No drop inlets around perimeter for drainage
  - The field average G-MAX tests result was 122 which falls within ASTM maximum allowed of 200.
  - End netting behind goals is sagging and in need of repair
- Maintenance Needs
  - Repair end netting
  - Aerate, seed, and fertilize the field regularly to provide a good stand of grass and even playing surface.
- Safety Concerns
  - No immediate safety concerns
- Recommendations
  - **Short Term:**
    - Install new sports netting behind the goals
    - Sand dress the low areas that are causing planarity issues to create a smooth surface. This will also temporarily help drainage.

- **Long Term:**
  - Regrade field and install new Bermuda sod over a sand based system or install a new synthetic surface.

9.5 Track (8 Lane)

- Existing Condition
  - Surface
    - 3/8" latex surfacing, good condition, no cracking or visible delamination
    - Surfacing at long/triple jump runways in good condition
    - Runway must be kept clean of debris or will deteriorate quickly
    - Lane striping looks okay, starting to fade
  - Asphalt
    - Asphalt at oval slopes towards outside which is unconventional in today's standards as storm runoff from grass field crosses track surfacing
    - Asphalt oval looks to be in good condition, older but no major cracking
    - Exposed inside edge will deteriorate quickly without a curb and with irrigation in close proximity
    - Planarity looks good, slopes look okay
    - Few bird bath locations
    - Lane 5 has a low area about 5-10 meters before common finish line
    - Low area collecting water, slope transition
    - Asphalt at long/triple jump runway is not smooth, looks like it collects water
    - Many layers of asphalt at high jump area
  - Perimeter
    - No outside or inside curbing which can cause surfacing at edges to deteriorate quickly
    - No drain at inside perimeter, this could cause ponding inside Lane 1 and at field edge
    - Inside edge is mostly higher than grass field inside as well as the outside edge is mostly higher from the surrounding grass
    - Where the edges are flush will be where drainage issues arise

- 6' high black perimeter fence, good condition – looks fairly new
- No bottom rail, has tension wire
- Cantilever slide gate looks to be resting on asphalt walk and may not slide correctly

- Oval and field Event conformance with NFHS standards
  - We attempted to determine the actual measure line length of the track oval by overlaying an aerial image with an AutoCAD drawing of a best fit track oval and believes it to be a 400m oval with a 104.43' radius. Without record drawings or a digital survey, we can't verify this with 100% certainty and recommends that the school verify the measure line distance with record documents or by hiring a surveyor with track and field experience.
  - Shot put pad and landing sector in okay condition
  - End of landing sector could use some additional stone to make level and complete grooming
  - Shot put landing sector boundary curbs look to be off-center with respect to the shot put concrete pad
  - The landing sector boundary curbs also look to be narrower than the required 34.92º sector
  - Discus pad in good condition, but netting is not correct for this cage and should be replaced
  - There is no pole vault runway upon inspection
  - Sand pits are not filled with sand, level with runway to limits at end

- Maintenance Needs
  - Debris including but not limited to grass/grass clippings, dirt and tree litter must be kept clear from track and field events to extend longevity
  - Keep vegetation out of perimeter stone edging on both sides
  - Lawn starting to encroach on lane 1 at North turn
  - Field slopes onto track at north apex, dirt collecting on lane 1
  - Stone/dirt encroaching on lane 8 at 300m start
  - Sand is very hard and dry
  - Keep sand off long/triple jump runways
- Safety Concerns

- Discus netting needs to be replaced. Orange construction fencing is not appropriate
- Sand Pits should be filled to level all the way to the back of pits

- Recommendations
  - **Short Term:**
    - Replace discus netting as soon as possible
    - Re-orient the shot put landing sector to be square with the concrete pad and expand the boundary curbs to be roughly 3' wider than the actual landing sector (34.92º). Stripe the landing sector in white paint
    - Supplement shot put landing area with additional stone
    - Construct pole vault runway and landing area, possibly along West side of track outside of fence limits
    - Cut back grass from inside and outside edge of track oval. We recommend using Round-Up or other weed killer (Regular maintenance)
    - Keep debris/grass clippings/leaf litter etc. off all track surfaced areas (On-going maintenance)
    - Construct a timber curb on the back end of both sand pits and fill sand up to at least flush with elevation of runway for conformance with NFHS
    - Restripe existing track ~1-2 years
    - Adjust and/or repair cantilever slide gate
  - **Long Term:**
    - Install trench drain at least along sides of field at inside edge of track to limit water ponding and/or washing across the track
    - Reconstruct Long/Triple Jump runway by removing and replacing the asphalt and surfacing
    - Remove and replace all synthetic surfacing within approximately 2-5 years
    - Reconstruct entire track oval to slope towards inside as per conventional standards and install inside perimeter drain around entire oval.

9.6 Tennis Courts

- Existing Condition
  - Surface
    - Surfacing is very thin
    - There are visible squeegee marks as it looks like less than the recommended number of coats was applied
    - Surfacing has delaminated completely in some areas on southern courts
  - Asphalt
    - Large heave at southeast court net post (~2"), most net posts heaving
    - Large amount of cracking, some differential settlement
    - Asphalt cracks range from ¼" – ¾", which is not uncommon and not to the point of being unsafe, however – they are numerous and unsightly
    - Worst cracks are on the northern side of the North 2 courts
    - Long transverse cracks, some >1" wide, some loose asphalt (these are the ones that could pose a safety risk and create a tripping hazard)
    - Most cracks are flat and not verticals
  - Fence
    - Good condition 10' high black vinyl fencing
    - No bottom or mid rail (tension wire only)
    - Gate between courts is not functional, should be replaced
  - Net/Post
    - Nets in fair condition
    - Net post foundations are heaving
- Maintenance Needs
  - Debris including but not limited to grass/grass clippings, dirt and tree litter must be kept clear from tennis court edges and fencing perimeter to extend longevity
  - Grass is encroaching on surfacing at perimeter
- Safety Concerns
  - No visible immediate safety concerns
  - Some cracks are starting to become potential tripping hazards, especially at Northern courts

- Recommendations
  - **Short Term:**
    - Replace single fence gate between the two sets of courts
    - Based on the number of cracks on the Southern courts and the severity of the cracks in the Northern Courts, our recommendation would be to remove and replace the asphalt pavement in kind assuming the stone base is in acceptable condition and of adequate thickness based on soil types. All net post foundations should also be replaced. Perimeter fencing can possibly be salvaged if mesh is temporarily removed during construction. We recommend this be done within 1-2 years at North courts and within 2-5 years at Southern courts.
  - **Long Term:**
    - Remove and replace all perimeter fencing. This could be done as part of the reconstruction of the courts if funding allows.

APPENDIX
Section I

Photo Log

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Roanoke County Public Schools

Athletic Facilities Condition Assessment

Cave Springs High School

Soccer Field

Draper Aden Associates
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01. Barren Area and Signs of Ponding Water

02. Barren Area and Signs of Ponding Water

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03. End Netting Sag

04. End Netting Sag

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Cave Springs High School

Practice Field

Draper Aden Associates
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01. Large Drainage Ditch

02. Large Drainage Ditch

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03. Net Sleeve

04. Damaged Perimeter Fence

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Cave Springs High School

Softball Field

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01. Infield

02. Outfield

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Cave Springs High School

Baseball Field

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01. Standing Water in Dugout

02. Standing Water in Dugout

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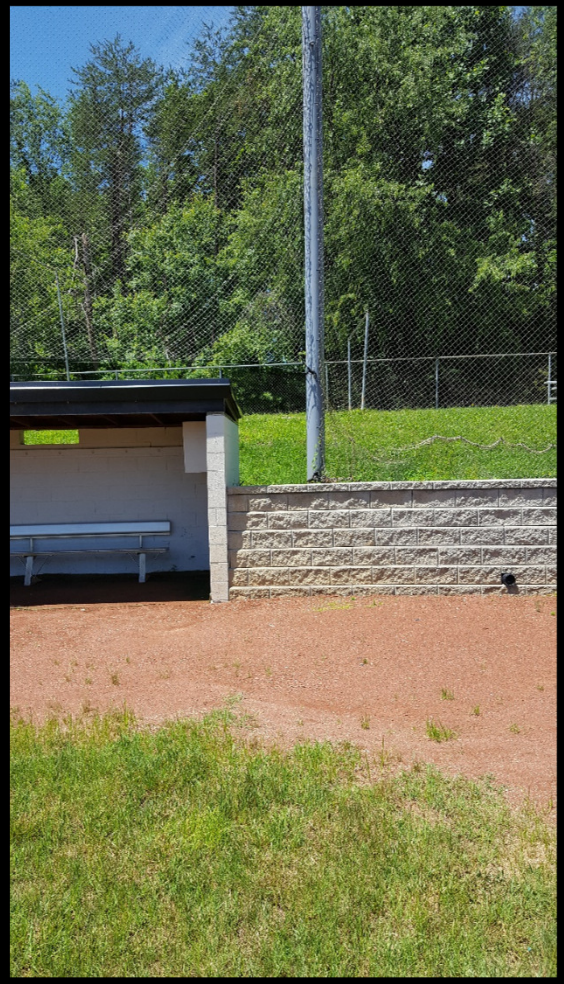
03. Slope Down Right Field Line



04. Hole in Safety Netting

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05. Bleachers

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Cave Springs High School

Track

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01. Striping

02. Shot Put Circle

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03. Goal Post in Shot Put Landing Area

04. Track Edge Where Water Collects

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05. Swale in Grass Field

06. No Perimeter Curb

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Cave Springs High School

Tennis Courts

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01. Surface Cracks

02. Surface Cracks

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03. Net Post

04. Surface Cracks

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05. Permeter Fence Foundation

06. Perimeter Fence no Bottom or Mid Rail

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Cave Springs Middle School

Football / Soccer Field

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01. Fibers Laying Over and Coiling

02. Planarity Issue

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03. Penalty Kick Inlay Coming Loose

04. Penalty Kick Inlay Coming Loose

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05. Weeds Growing Along the Edge

06. Seem and Planarity Issue

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Northside High School & Middle School

Football Field

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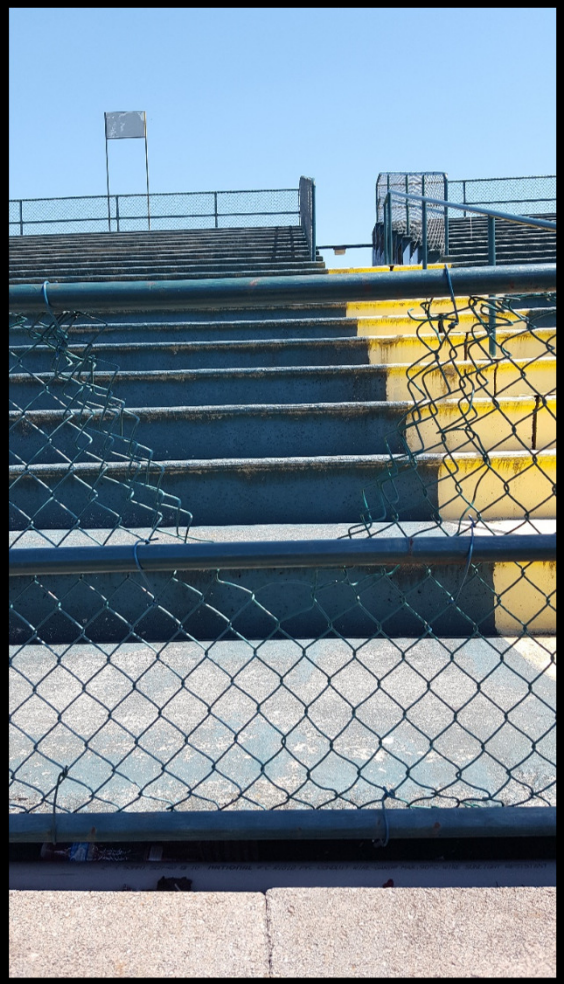
01. Barren Areas



02. Bleacher Fence Needing Repair

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03. Perimeter Fence Needing Repair

04. Perimeter Fence Needing Repair

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05. Perimeter Fence Needing Repair

06. Perimeter Fence Needing Repair

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07. Asphalt Walk from Tennis Court Parking Lot

08. Tennis Court Parking Lot

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Northside High School & Middle School

Baseball Field

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01. Safety Netting Along Right Field

02. Safety Netting Along Right Field

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03. Extend Safety Netting Along Right Field

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Northside High School & Middle School

Practice Field / Soccer Field

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01. Barren Spots and No End Netting

02. Barren Spots in Turf

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03. Fence Needing Repairs

04. No End Netting

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Northside High School & Middle School

Track

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01. No Drain on Inside Perimeter and Elevation Change

02. Debris on Surface

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03. Discus Cage Netting Sag

04. Limited Space Outside Lane 6

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Northside High School & Middle School

Tennis Courts

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01. Perimeter Fence Condition

02. Cracks

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03. Cracks and Nets

04. Surface and Tree Overhang

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William Byrd High School & Middle School

Football Field

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01. Fibers Standing Up in Good Condition

02. Striping Looks Good

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03. Numbering in Good Condition

04. Logo in Good Condition

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William Byrd High School & Middle School

Softball Field

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01. No Fencing Along Left Field Line

02. Trees Needing Trim Along Right Field Line

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03. Extend Safety Netting

04. Extend Retaining Wall Down Left Field Line

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William Byrd High School & Middle School

Practice Field

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01. Grass in Good Condition

02. Upgrade Football Goal Posts

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William Byrd High School & Middle School

Baseball Field

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01. Extend Safety Netting Down Right Field Line

02. Upper Level Fence Sagging

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William Byrd High School & Middle School

Track

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01. Fence Too Close to Track

02. No Trench Drain

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03. No Shot Put Circle Ring

04. Discus Cage Netting Needs Repair

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William Byrd High School & Middle School

Tennis Courts

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01. Net Post Achor Heaving

02. Crack at Northwest Corner Entrance

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03. Net Post Foundation Heaving

04. Areas of Delamination and Streaking

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Glenvar High School & Middle School

Football Field

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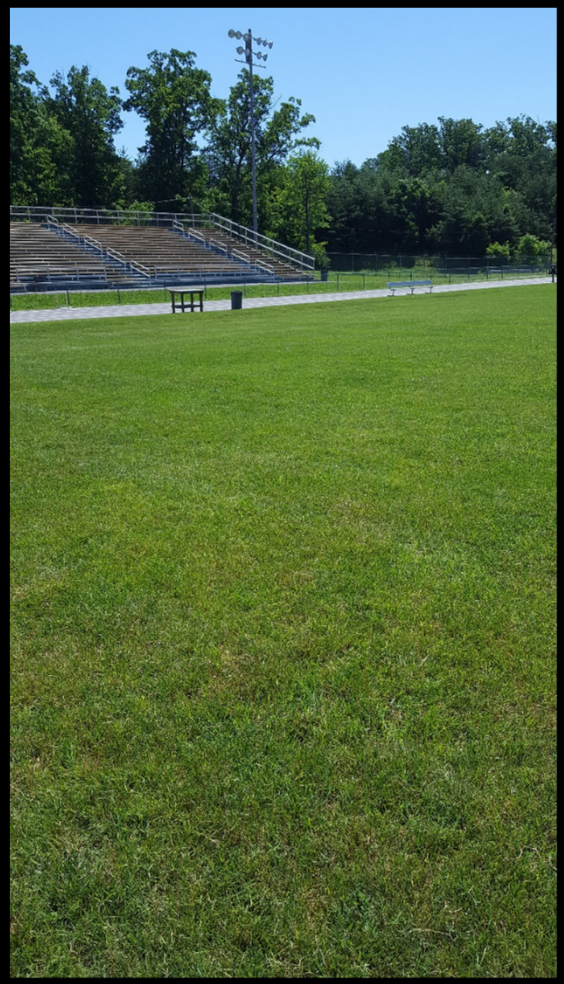
01. Barren Areas and Planarity Changes



02. Planarity Changes

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03. No Drop Inlets

04. No Handrails

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05. Wash Out at Visiting Bleachers

06. No Fabric on Perimeter Fence

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Glenvar High School & Middle School

Softball Field

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01. Outfield Fence Needing Repair

02. Install Taller Fence in Front of Bleachers

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Glenvar High School & Middle School

Practice Field

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01. Barren Areas and Planarity Changes

02. Barren Areas and Planarity Changes

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03. Barren Areas and Planarity Changes

04. Difficult Field Access

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Glenvar High School & Middle School

Baseball Field

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01. Fence Repair in Front of Dugout

02. Fence Repair Along Left Field Line

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Glenvar High School & Middle School

Soccer Field

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01. Barren Areas and Signs of Ponding

02. Sink Hole Outside Perimeter Fence

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03. End Netting Needs Replaced

04. Weeds and Brush Along Perimeter of Field

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Glenvar High School & Middle School

Track

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01. No Surfacing, Asphalt Only

02. Crack in Asphalt

Draper Aden Associates
Engineering • Surveying • Environmental Services

03. No Curb or Trench Drain Along Edge

04. Shot Put Not in Conformance

Draper Aden Associates
Engineering • Surveying • Environmental Services

05. Long and Triple Jump in Poor Condition

06. Discus Net in Fair Condition

Draper Aden Associates
Engineering • Surveying • Environmental Services

Glenvar High School & Middle School

Tennis Courts

Draper Aden Associates
Engineering • Surveying • Environmental Services

01. Surface Fading and Cracks

02. Surface Fading and Cracks

Draper Aden Associates
Engineering • Surveying • Environmental Services

03. Bad Depression at Western Court Net

04. Fence in Good Condition

Draper Aden Associates
Engineering • Surveying • Environmental Services

Hidden Valley High School

Practice Field

Draper Aden Associates
Engineering • Surveying • Environmental Services

01. Barren Areas Signs of Ponding

02. Barren Areas and Planarity Changes

Draper Aden Associates
Engineering • Surveying • Environmental Services

03. Water Ponding Along Edge of Track

04. Barren Areas

Draper Aden Associates
Engineering • Surveying • Environmental Services

05. Barren Areas

06. Barren Areas and Planarity Changes

Draper Aden Associates
Engineering • Surveying • Environmental Services

Hidden Valley High School

Softball Field

Draper Aden Associates
Engineering • Surveying • Environmental Services

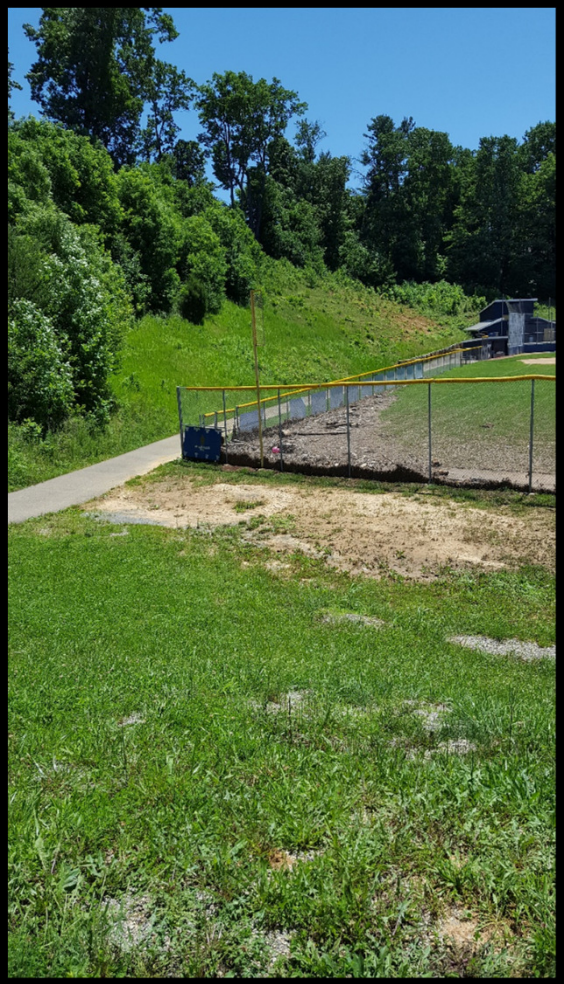
01. Backstop Needing Repair

Draper Aden Associates
Engineering • Surveying • Environmental Services

Hidden Valley High School

Baseball Field

Draper Aden Associates
Engineering • Surveying • Environmental Services



01. Flood Damage

02. Flood Damage

Draper Aden Associates
Engineering • Surveying • Environmental Services

Hidden Valley High School

Soccer Field

Draper Aden Associates
Engineering • Surveying • Environmental Services

01. Barren Areas and Planarity Changes

02. No Drop Inlets Around Perimeter

Draper Aden Associates
Engineering • Surveying • Environmental Services

03. End Netting Needing Repair

04. End Netting Needing Repair

Draper Aden Associates
Engineering • Surveying • Environmental Services

Hidden Valley High School

Track

Draper Aden Associates
Engineering • Surveying • Environmental Services

01. Exposed Inside Edge

02. No Outside Curbing

Draper Aden Associates
Engineering • Surveying • Environmental Services

03. Shot Put

04. Inside Edge No Curb or Trench Drain

Draper Aden Associates
Engineering • Surveying • Environmental Services

05. Incorrect Netting

06. Sand Pits

Draper Aden Associates
Engineering • Surveying • Environmental Services

Hidden Valley High School

Tennis Courts

Draper Aden Associates
Engineering • Surveying • Environmental Services

01. Streaks and Surface Delamination

02. Large Crack

Draper Aden Associates
Engineering • Surveying • Environmental Services

03. Multiple Cracks

04. Entrance Gate Needs Replaced

Draper Aden Associates
Engineering • Surveying • Environmental Services

05. Net Post Foundation Heaving and Cracking

06. Fence Foundation Cracking

Draper Aden Associates
Engineering • Surveying • Environmental Services

APPENDIX
Section II

GMAX Data

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Test Performed By: Jeff Clise
on behalf of Athletic Field Consultants, Inc.

Report No.: 18-024A-1

Date of Test: 6/5/2018 (warm, sunny, light breeze)

General Project Information

Project Name: Cave Spring High School Soccer Field
Project Address: 3712 Chaparral Drive, Roanoke, VA 24018
Contact Name: Justin Cornwell, Draper Aden Associates
Contact Phone: o 804-261-1843 c 804-869-8110
Contact Email: JCornwell@daa.com

Field Conditions and Description of Field on Date of Test

Field Play Configuration: Soccer

Field Orientation: N, S (End to End)
Field Surface Type: Natural Grass Manufacturer: N/A Installation Date: N/A
Field Planarity: Noted in Observations/Recommendations

Test Point	Probe Depth (inches)	Temperature (F.) Air	Field	Drop No. 1	Drop No. 2	Drop No. 3	Average Drop (2 and 3)
1	1 ½	76	87	136	142	146	144
2	1 ¾	76	85	104	121	125	123
3	1 ¾	76	78	89	104	109	107
4	1 ¼	76	89	96	116	122	119
5	2	76	79	81	93	96	95
6	1 ¼	76	84	120	141	146	144
7	2	76	83	87	103	108	106
8	1 ¼	76	84	113	137	143	140
9	1 ¾	76	84	115	135	143	139
10	2	76	88	94	109	113	111
Average GMAX Value for Entire Field							123
Values in Bold/Red Exceed the ASTM Maximum Allowed G-MAX of 200							
ASTM Specified Drop Height: 2' Producing an Impact Velocity 11.35 FPS ± 0.56							
Test Method: ASTM F 355, Test Method for Shock-Absorbing Properties of Playing Surface Systems and Materials. ASTM F1936-10, Standard Specification for Impact Attenuation of Turf Playing Systems as measured in the Field (G-MAX)							
Test equipment calibrated March 2017.							

Report Summary

Introduction:

An independent analysis of the natural grass playing surface, relative to gmax and general field conditions, was requested by the client. G-MAX Testing and Field Inspections were performed on the Cave Spring Soccer Field on June 5, 2018. Ten separate locations were tested for G-MAX values. Each test location had three G-MAX tests performed in order to obtain the average G-MAX. The tests were performed using ASTM certified and calibrated equipment, and were performed at locations on the field as determined by the ASTM F 1936-10 Specifications. The test results reported herein reflect the performance of the points tested at the time of testing and at the temperatures reported.

Findings/Recommendations:

No site abnormalities were found and there were no deviations from standard test procedures. All test points met the requirement of less than 200 average G-MAX when tested except for those indicated by Bold Red and shown in the Test Result G-Max Table.

Athletic Field Consultants, Inc.

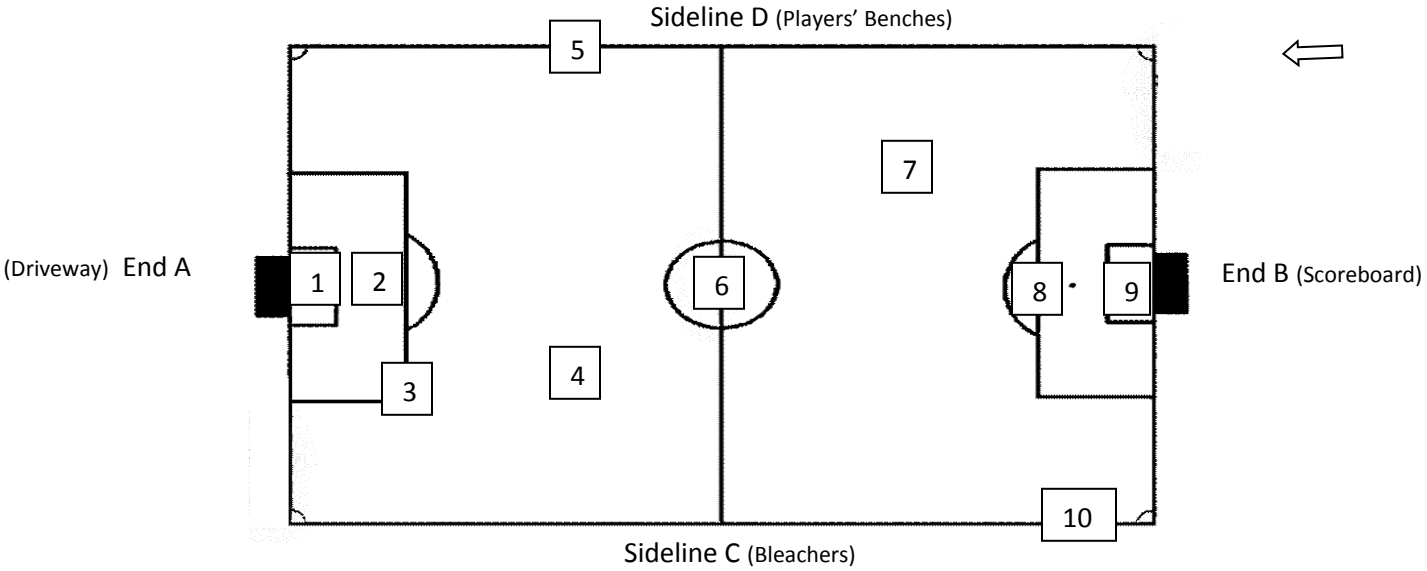
G-MAX Test and Field Inspection Report

Project Name: Cave Spring High School Soccer Field

Report No.: 18-024A-1

Date of Test: 6/5/2018

Test Point Location Diagram (Soccer Field)



Test No.	Test Point Location Description
1	3 ft. from Goal Line to Half-Way Line, End A, Center of Field
2	Penalty Kick Line, End A, Center of Field
3	63 ft. from Center of Field to Corner of Penalty Box, Touch Line C, End A
4	75 ft. from Half-Way Line to End A, 40 ft from Center of Field to Touch Line C
5	75 ft. from Half-Way Line to End A at Sideline D
6	Half-Way Line, Center of Field
7	75 ft. from Half-Way Line to End B, 63 ft from Center of Field to Touch Line D
8	½ the distance from Penalty Restraining Arc to leading edge of Penalty Box at End B, Center of Field
9	15 ft. from Goal Line to Half-Way Line, End B, Center of Field
10	30 ft. from Goal Line to Half-Way Line, End B at Touch Line C

*All test point locations are in accordance with ASTM specifications, but performed in sequence determined by tester.

Contact Discussions

Field Use: Soccer
Frequency of Use: Unknown
Maintenance Schedule: Unknown
Maintenance Equipment: Unknown

Turf Condition (Standing, Starting to Lay Over, Laying Over, Excess Fiber Wear, Inlays)

Goal Area: N/A
Creases/Penalty Kick: N/A
Center Field: N/A
Logo/Colored Areas: N/A
Sidelines: N/A
Inlays: N/A
Access Points to Field: N/A

General

Field Accessibility: Multiple
Field Security: Fence
Sporting Event Accessories and Maintenance Equipment Storage: Off Field

Observations/Recommendations: The field appears to be mostly grass covered; however, there many areas where the grass is sparse or baron in the high wear areas (front of goals, penalty kick, center of field) as well as other areas of the field including the sidelines. This can be seen in the overhead photos on pages 11 and 12 of this report. Despite many previous days of rain, the depth gauge probe was only able to penetrate into the soil from 1 ¼ to 2 inches in various locations, as reflected in the chart on page 1 of this report. Although the field meets the ASTM standard relative to GMAX at this time, it is important to remember that the soil composition and amount of moisture in a natural grass field have a direct impact on these results. It should also be noted that there are numerous subtle planarity changes across the field. It is evident from the surface of the soil that rain water ponds in the low areas. Additionally, the irregular transition from the fully grass covered areas to the sparse and baron areas affect the footing of the athlete and the potential for injuries to the lower body extremities.

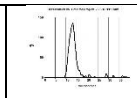
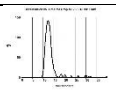
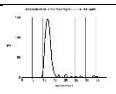
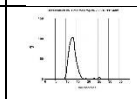
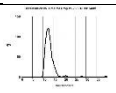
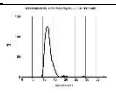
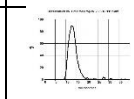
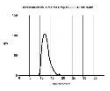
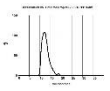
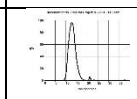
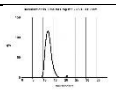
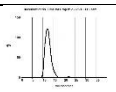
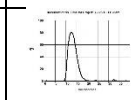
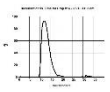
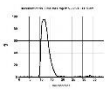
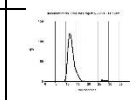
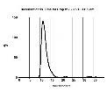
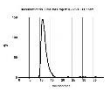
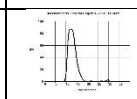
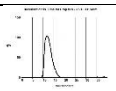
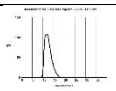
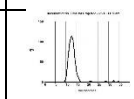
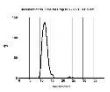
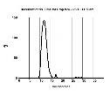
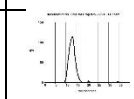
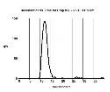
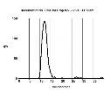
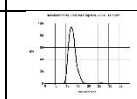
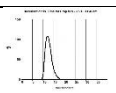
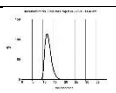
Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Impact Test Data
(Acceleration Time Curve)

Project Name: Cave Spring HS Soccer
Report No.: 18-024A-1

Date of Test: 6/5/2018
Test Performed By: Jeff Clise

Test Point No. 1 Drop Point No. 1		Test Point No.1 Drop Point No. 2		Test Point No.1 Drop Point No. 3	
Test Point No. 2 Drop Point No. 1		Test Point No. 2 Drop Point No. 2		Test Point No. 2 Drop Point No. 3	
Test Point No. 3 Drop Point No. 1		Test Point No. 3 Drop Point No. 2		Test Point No. 3 Drop Point No. 3	
Test Point No. 4 Drop Point No. 1		Test Point No. 4 Drop Point No. 2		Test Point No. 4 Drop Point No. 3	
Test Point No. 5 Drop Point No. 1		Test Point No. 5 Drop Point No. 2		Test Point No. 5 Drop Point No. 3	
Test Point No. 6 Drop Point No. 1		Test Point No. 6 Drop Point No. 2		Test Point No. 6 Drop Point No. 3	
Test Point No. 7 Drop Point No. 1		Test Point No. 7 Drop Point No. 2		Test Point No. 7 Drop Point No. 3	
Test Point No. 8 Drop Point No. 1		Test Point No. 8 Drop Point No. 2		Test Point No. 8 Drop Point No. 3	
Test Point No. 9 Drop Point No. 1		Test Point No. 9 Drop Point No. 2		Test Point No. 9 Drop Point No. 3	
Test Point No. 10 Drop Point No. 1		Test Point No. 10 Drop Point No. 2		Test Point No. 10 Drop Point No. 3	

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Test Point Location Photographs

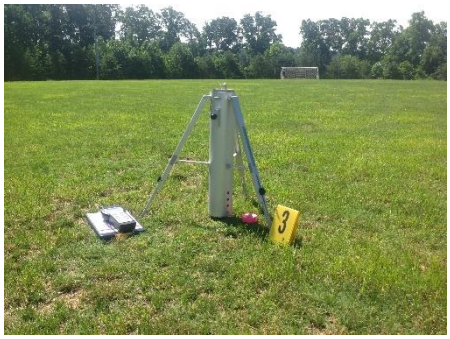
Project Name: Cave Spring HS Soccer Field

Date of Test: 6/5/2018

Report No.: 18-024A-1

Test No. 1

Test No. 2



Test No. 3

Test No. 4

Test No. 5

Test No. 6

Test No. 7

Test No. 8

Test No. 9

Test No. 10

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Cave Spring HS Soccer **Date of Test: 6/5/18** **Report No.: 18-024A-1**








Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Cave Spring HS Soccer **Date of Test: 6/5/18** **Report No.: 18-024A-1**





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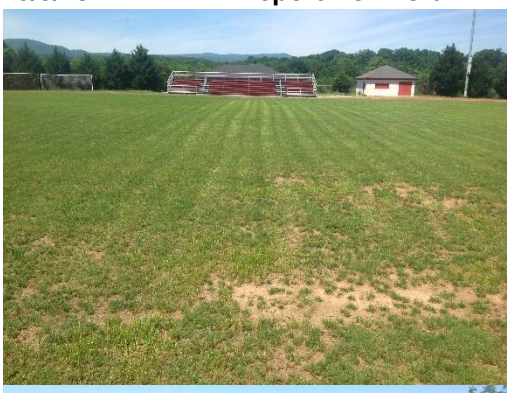
Jeff Clise (301) 908-3526

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Cave Spring HS Soccer **Date of Test: 6/5/18** **Report No.: 18-024A-1**





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Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Cave Spring HS Soccer **Date of Test: 6/5/18** **Report No.: 18-024A-1**








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G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Cave Spring HS Soccer **Date of Test: 6/5/18** **Report No.: 18-024A-1**








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G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Cave Spring HS Soccer **Date of Test: 6/5/18** **Report No.: 18-024A-1**

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G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Cave Spring HS Soccer **Date of Test: 6/5/18** **Report No.: 18-024A-1**

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Jeff Clise (301) 908-3526

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Test Performed By: Jeff Clise
on behalf of Athletic Field Consultants, Inc.

Report No.: 18-024B-1

General Project Information

Date of Test: 6/4/2018 (warm, sunny, light breeze)

Project Name: Cave Spring High School Practice Field
Project Address: 3712 Chaparral Drive, Roanoke, VA 24018
Contact Name: Justin Cornwell, Draper Aden Associates
Contact Phone: o 804-261-1843 c 804-869-8110
Contact Email: JCornwell@daa.com

Field Conditions and Description of Field on Date of Test

Field Play Configuration: Football

Field Orientation: N, S (End to End)
Field Surface Type: Natural Grass Manufacturer: N/A Installation Date: N/A
Field Planarity: Noted in Observations/Recommendations

Test Point	Probe Depth (inches)	Temperature (F.) Air	Field	Drop No. 1	Drop No. 2	Drop No. 3	Average Drop (2 and 3)
1	6	78	85	77	79	78	79
2	6	78	88	62	66	66	66
3	5	78	87	66	68	67	68
4	5	78	89	73	67	70	69
5	5	78	90	82	90	93	92
6	5	78	87	54	64	67	66
7	6	78	82	44	53	53	53
8	6	78	89	48	50	61	56
9	5	78	99	78	84	85	85
10	6	78	85	45	52	55	54
Average GMAX Value for Entire Field							69
Values in Bold/Red Exceed the ASTM Maximum Allowed G-MAX of 200							
ASTM Specified Drop Height: 2' Producing an Impact Velocity 11.35 FPS ± 0.56							
Test Method: ASTM F 355, Test Method for Shock-Absorbing Properties of Playing Surface Systems and Materials. ASTM F1936-10, Standard Specification for Impact Attenuation of Turf Playing Systems as measured in the Field (G-MAX)							
Test equipment calibrated March 2017.							

Report Summary

Introduction:

An independent analysis of the natural grass playing surface, relative to gmax and general field conditions, was requested by the client. G-MAX Testing and Field Inspections were performed on the Cave Spring High School Practice Field on June 5, 2018.

Ten separate locations were tested for G-MAX values. Each test location had three G-MAX tests performed in order to obtain the average G-MAX. The tests were performed using ASTM certified and calibrated equipment, and were performed at locations on the field as determined by the ASTM F 1936-10 Specifications. The test results reported herein reflect the performance of the points tested at the time of testing and at the temperatures reported.

Findings/Recommendations:

No site abnormalities were found and there were no deviations from standard test procedures. All test points met the requirement of less than 200 average G-MAX when tested except for those indicated by Bold Red and shown in the Test Result G-Max Table.

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

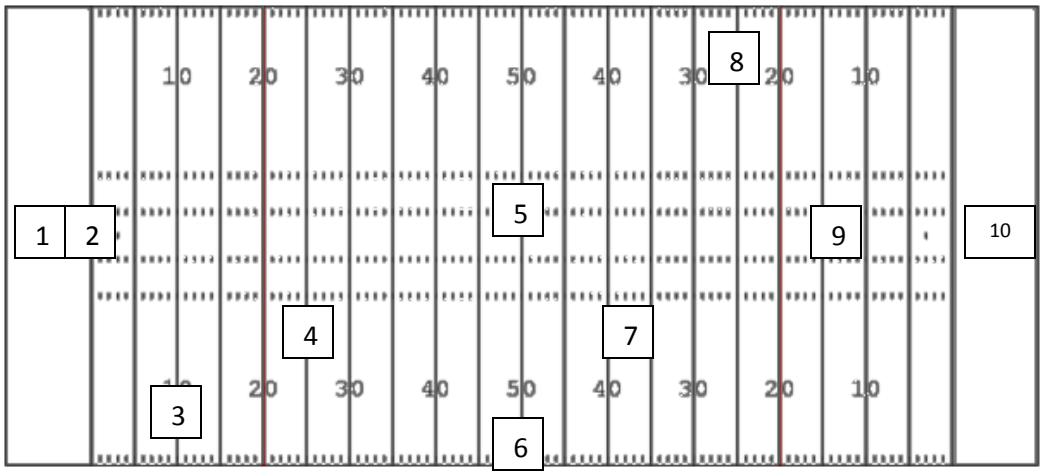
Project Name: Cave Spring High School Practice Field

Report No.: 18-024B-1

Date of Test: 6/5/2018

Test Point Location Diagram (Football Field)

Sideline D (Fence)



(Field House) End A

End B (Roadway)

Sideline C (Bleachers/School)

Test No.	Test Point Location Description
1	End Zone A 6'From Goal Line Along Center Line of Field
2	End Zone A Goal Line at Center of Field
3	End A 10 Yard Line at Numbers Along Sideline C
4	End A 25 Yard Line at the Hash Marks Along Sideline C
5	50 Yard Line at Center of Field
6	50 Yard Line at Side Line C
7	End B 35 Yard Line at the Hash Marks Along Sideline C
8	End B 25 Yard Line at the Numbers Along Sideline D
9	End B 12 Yard Line Center of Field
10	End Zone B 6' From Back of End Zone Along Center Line of Field

*All test point locations are in accordance with ASTM specifications, but performed in sequence determined by tester.

Contact Discussions

Field Use: Football

Frequency of Use: Unknown

Maintenance Schedule: Unknown

Maintenance Equipment: Unknown

Turf Condition (Standing, Starting to Lay Over, Laying Over, Excess Fiber Wear, Inlays)

Goal Area: N/A

Creases/Penalty Kick: N/A

Center Field: N/A

Logo/Colored Areas: N/A

Sidelines: N/A

Inlays: N/A

Access Points to Field: N/A

General

Field Accessibility: Multiple

Field Security: Fence

Sporting Event Accessories and Maintenance Equipment Storage: Off Field

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Jeff Clise (301) 908-3526

Observations/Recommendations: The field appears to be mostly grass covered and rather clumpy; however, there are areas where the grass is sparse or baron in the high wear areas (front of goals, penalty kicks, center of field) as well as other areas of the field. This can be seen in the overhead photos on pages 11 and 12 of this report. The field was only partially mowed at the time of testing, which made it difficult to evaluate. At the time of testing, the soil was relatively moist due to many previous days of rain. The depth gauge probe was able to penetrate into the soil from 5 to 6 inches in various locations, as reflected in the chart on page 1 of this report. Although the field meets the ASTM standard relative to GMAX at this time, it is important to remember that the soil composition and amount of moisture in a natural grass field have a direct impact on these results. It should also be noted that there are numerous subtle planarity changes across the field. It is evident from the surface of the soil that rain water ponds in the low areas. Additionally, the irregular transition from the fully grass covered areas to the sparse and baron areas affect the footing of the athlete and the potential for injuries to the lower body extremities. At End A, there is a drainage swale in the field of play within the end zone. This swale should be relocated outside the field of play. At End B, the gravel/track event field line should be moved back from the rear of the end zone to the back of the goose neck pole.

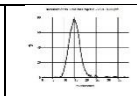
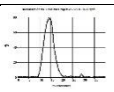
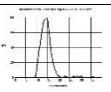
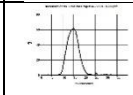
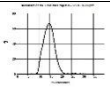
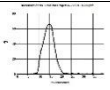
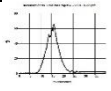
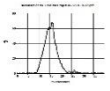
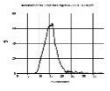
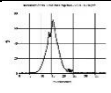
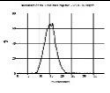
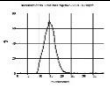
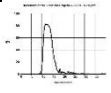
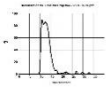
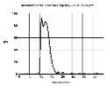
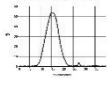
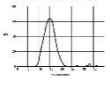
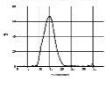
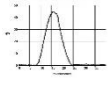
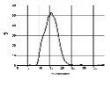
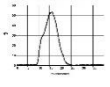
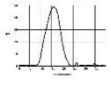
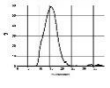
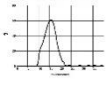
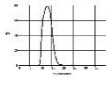
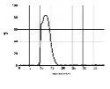
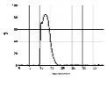
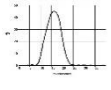
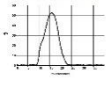
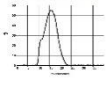
Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Impact Test Data
(Acceleration Time Curve)

Project Name: Cave Spring HS Practice
Report No.: 18-024B-1

Date of Test: 6/5/2018
Test Performed By: Jeff Clise

Test Point No. 1 Drop Point No. 1		Test Point No.1 Drop Point No. 2		Test Point No.1 Drop Point No. 3	
Test Point No. 2 Drop Point No. 1		Test Point No. 2 Drop Point No. 2		Test Point No. 2 Drop Point No. 3	
Test Point No. 3 Drop Point No. 1		Test Point No. 3 Drop Point No. 2		Test Point No. 3 Drop Point No. 3	
Test Point No. 4 Drop Point No. 1		Test Point No. 4 Drop Point No. 2		Test Point No. 4 Drop Point No. 3	
Test Point No. 5 Drop Point No. 1		Test Point No. 5 Drop Point No. 2		Test Point No. 5 Drop Point No. 3	
Test Point No. 6 Drop Point No. 1		Test Point No. 6 Drop Point No. 2		Test Point No. 6 Drop Point No. 3	
Test Point No. 7 Drop Point No. 1		Test Point No. 7 Drop Point No. 2		Test Point No. 7 Drop Point No. 3	
Test Point No. 8 Drop Point No. 1		Test Point No. 8 Drop Point No. 2		Test Point No. 8 Drop Point No. 3	
Test Point No. 9 Drop Point No. 1		Test Point No. 9 Drop Point No. 2		Test Point No. 9 Drop Point No. 3	
Test Point No. 10 Drop Point No. 1		Test Point No. 10 Drop Point No. 2		Test Point No. 10 Drop Point No. 3	

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G-MAX Test and Field Inspection Report

Test Point Location Photographs

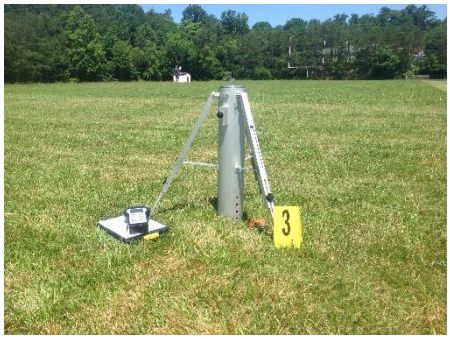
Project Name: Cave Spring High School Practice Field

Date of Test: 6/5/2018

Report No.: 18-024B-1

Test No. 1

Test No. 2



Test No. Test No. 3

Test No. 4

Test No. 5

Test No. 6

Test No. 7

Test No. 8

Test No. 9

Test No. 10

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

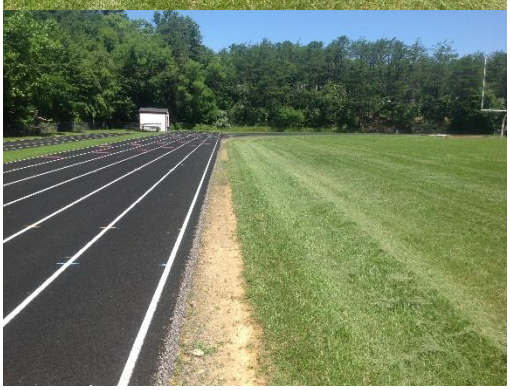
Location Photographs

Project Name: Cave Spring HS Practice Field **Date of Test: 6/5/18** **Report No.: 18-024B-1**







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G-MAX Test and Field Inspection Report

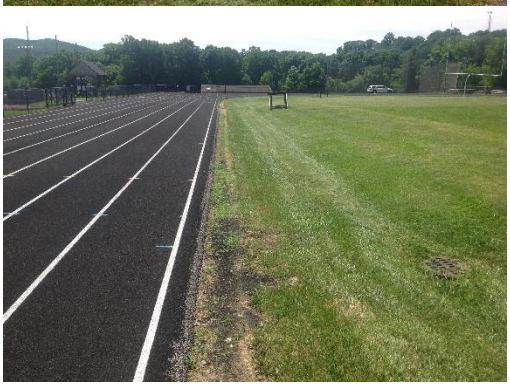
Location Photographs

Project Name: Cave Spring HS Practice Field **Date of Test: 6/5/18** **Report No.: 18-024B-1**










Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Cave Spring HS Practice Field **Date of Test: 6/5/18** **Report No.: 18-024B-1**

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G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Cave Spring HS Practice Field **Date of Test: 6/5/18** **Report No.: 18-024B-1**








Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Cave Spring HS Practice Field **Date of Test: 6/5/18** **Report No.: 18-024B-1**

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G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Cave Spring HS Practice Field **Date of Test: 6/5/18** **Report No.: 18-024B-1**

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Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Cave Spring HS Practice Field **Date of Test: 6/5/18** **Report No.: 18-024B-1**

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Jeff Clise (301) 908-3526

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Test Performed By: Jeff Clise
on behalf of Athletic Field Consultants, Inc.

Report No.: 18-023B-1

General Project Information

Date of Test: 6/4/2018 (warm, sunny, light breeze)

Project Name: Cave Spring Middle School Stadium
Project Address: 4880 Brambleton Avenue, Roanoke, VA 24018
Contact Name: Justin Cornwell, Draper Aden Associates
Contact Phone: o 804-261-1843 c 804-869-8110
Contact Email: JCornwell@daa.com

Field Conditions and Description of Field on Date of Test

Field Play Configuration: Football, Soccer (M & W Lacrosse – painted)

Field Orientation: NE, SW (End to End)
Field Surface Type: FTHS 1S Manufacturer: FieldTurf Installation Date: 9/2007
Field Planarity: Noted In Observations/Recommendations

Test Point	Infill Depth (mm)	Temperature (F.) Air	Field	Drop No. 1	Drop No. 2	Drop No. 3	Average Drop (2 and 3)
1	36	74	113	150	152	150	151
2	36	74	119	140	148	148	148
3	36	74	109	132	134	131	133
4	36	74	117	127	133	133	133
5	36	74	112	132	141	140	141
6	39	74	114	120	121	120	121
7	37	74	116	135	141	139	140
8	35	74	106	125	131	129	130
9	35	74	111	143	150	149	150
10	37	74	116	144	152	151	152
Average GMAX Value for Entire Field							140
Values in Bold/Red Exceed the ASTM Maximum Allowed G-MAX of 200							
ASTM Specified Drop Height: 2' Producing an Impact Velocity 11.35 FPS ± 0.56							
Test Method: ASTM F 355, Test Method for Shock-Absorbing Properties of Playing Surface Systems and Materials. ASTM F1936-10, Standard Specification for Impact Attenuation of Turf Playing Systems as measured in the Field (G-MAX)							
Test equipment calibrated March 2017.							

Report Summary

Introduction:

An independent analysis of the FieldTurf synthetic playing surface, relative to gmax and general field conditions, was requested by the client. G-MAX Testing and Field Inspections were performed on the Cave Spring Middle School Stadium Field on June 5, 2018.
Ten separate locations were tested for G-MAX values. Each test location had three G-MAX tests performed in order to obtain the average G-MAX. The tests were performed using ASTM certified and calibrated equipment, and were performed at locations on the field as determined by the ASTM F 1936-10 Specifications. The test results reported herein reflect the performance of the points tested at the time of testing and at the temperatures reported.

Findings/Recommendations:

No site abnormalities were found and there were no deviations from standard test procedures. All test points met the requirement of less than 200 average G-MAX when tested except for those indicated by Bold Red and shown in the Test Result G-Max Table.

Athletic Field Consultants, Inc.

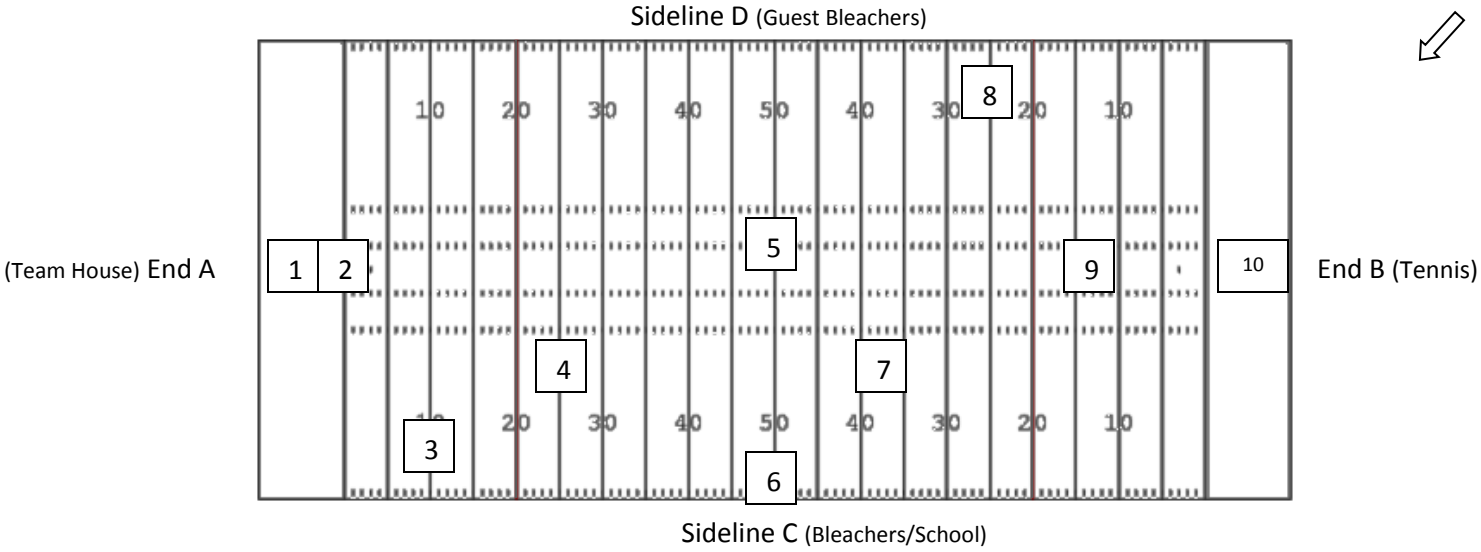
G-MAX Test and Field Inspection Report

Project Name: Cave Spring Middle School Stadium

Report No.: 18-023B-1

Date of Test: 6/5/2018

Test Point Location Diagram (Football Field)



Test No.	Test Point Location Description
1	End Zone A 6'From Goal Line Along Center Line of Field
2	End Zone A Goal Line at Center of Field
3	End A 10 Yard Line at Numbers Along Sideline C
4	End A 25 Yard Line at the Hash Marks Along Sideline C
5	50 Yard Line at Center of Field
6	50 Yard Line at Side Line C
7	End B 35 Yard Line at the Hash Marks Along Sideline C
8	End B 25 Yard Line at the Numbers Along Sideline D
9	End B 12 Yard Line Center of Field
10	End Zone B 6' From Back of End Zone Along Center Line of Field

*All test point locations are in accordance with ASTM specifications, but performed in sequence determined by tester.

Contact Discussions

Field Use: Football, Soccer, M & W Lacrosse
Frequency of Use: Unknown
Maintenance Schedule: Unknown
Maintenance Equipment: Unknown

Turf Condition (Standing, Starting to Lay Over, Laying Over, Excess Fiber Wear, Inlays)

Goal Area: Laying Over, Starting to Coil
Creases/Penalty Kick: Laying Over, Starting to Coil
Center Field: Laying Over, Starting to Coil
Logo/Colored Areas: Laying Over, Starting to Coil
Sidelines: Laying Over, Starting to Coil
Inlays: Laying Over, Starting to Coil
Access Points to Field: Laying Over, Starting to Coil

General

Field Accessibility: Multiple
Field Security: Fence
Sporting Event Accessories and Maintenance Equipment Storage: Off Field

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Observations/Recommendations: Field looks great for its age; it is 11 years old. The green fibers, and inlay lines across the the field are laying over and starting to coil. The white inlay lines are also becoming brittle, breaking off and reduced in volume. This is a result of the age of the field, amount of play it receives, mechanical wear and possible UV degradation. There are no fiber slip lock issues. The penalty kick line at End B has been replaced, but is coming loose; it needs to be hot melt glued in place and sheared down to match the surrounding fiber height. It is also noted that a previous repair has also been made at the 2 ½ yard line at End A at the edge of Sideline C. The depth gauge probe easily penetrated the surface indicating the base is not compacted. The infill depths in the high wear areas (goals, creases, penalty kicks, center of field) should be monitored regularly and rubber added, as needed. There are slight planarity changes at midfield, but they do not affect the playability of the field. There are weeds/grasses growing along the edge of the field; spray Round-Up to prevent them from encroaching into the turf. Continue to groom per manufacturer's instructions and continue annual GMAX testing to ensure proper performance of field.

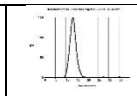
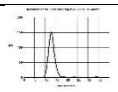
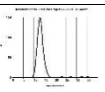
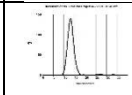
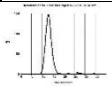
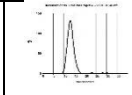
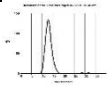
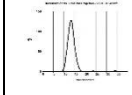
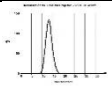
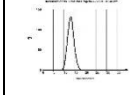
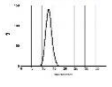
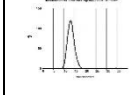
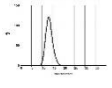
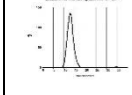
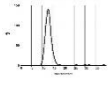
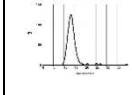
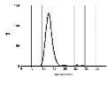
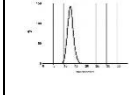
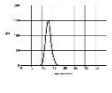
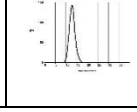
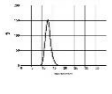
Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Impact Test Data
(Acceleration Time Curve)

Project Name: Cave Spring MS Stadium
Report No.: 18-023B-1

Date of Test: 6/5/2018
Test Performed By: Jeff Clise

Test Point No. 1 Drop Point No. 1		Test Point No.1 Drop Point No. 2		Test Point No.1 Drop Point No. 3	
Test Point No. 2 Drop Point No. 1		Test Point No. 2 Drop Point No. 2		Test Point No. 2 Drop Point No. 3	
Test Point No. 3 Drop Point No. 1		Test Point No. 3 Drop Point No. 2		Test Point No. 3 Drop Point No. 3	
Test Point No. 4 Drop Point No. 1		Test Point No. 4 Drop Point No. 2		Test Point No. 4 Drop Point No. 3	
Test Point No. 5 Drop Point No. 1		Test Point No. 5 Drop Point No. 2		Test Point No. 5 Drop Point No. 3	
Test Point No. 6 Drop Point No. 1		Test Point No. 6 Drop Point No. 2		Test Point No. 6 Drop Point No. 3	
Test Point No. 7 Drop Point No. 1		Test Point No. 7 Drop Point No. 2		Test Point No. 7 Drop Point No. 3	
Test Point No. 8 Drop Point No. 1		Test Point No. 8 Drop Point No. 2		Test Point No. 8 Drop Point No. 3	
Test Point No. 9 Drop Point No. 1		Test Point No. 9 Drop Point No. 2		Test Point No. 9 Drop Point No. 3	
Test Point No. 10 Drop Point No. 1		Test Point No. 10 Drop Point No. 2		Test Point No. 10 Drop Point No. 3	

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G-MAX Test and Field Inspection Report

Test Point Location Photographs

Project Name: Cave Spring Middle School Stadium

Date of Test: 6/5/2018

Report No.: 18-023B-1

Test No. 1

Test No. 2

Test No. 3

Test No. 4

Test No. 5

Test No. 6

Test No. 7

Test No. 8

Test No. 9

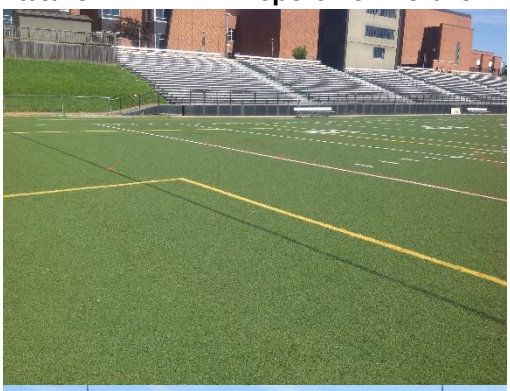
Test No. 10

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Cave Spring MS Stadium **Date of Test: 6/5/18** **Report No.: 18-023B-1**





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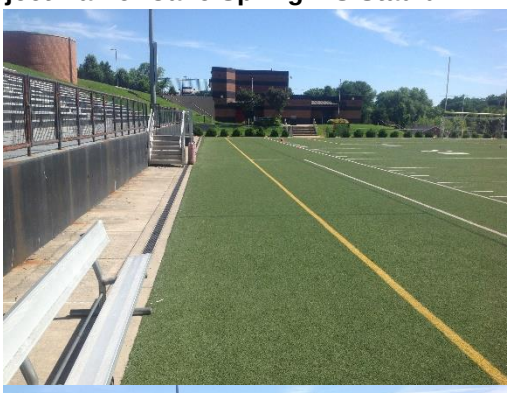
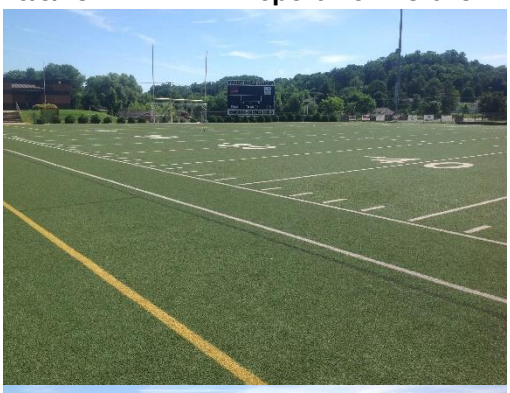
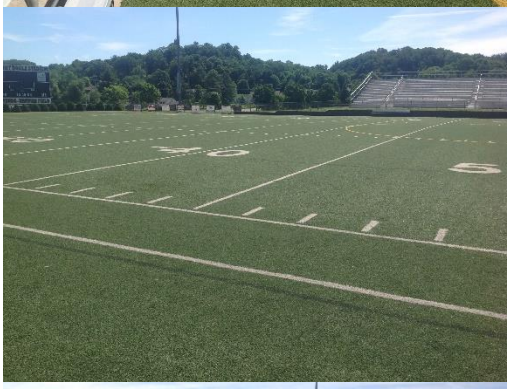
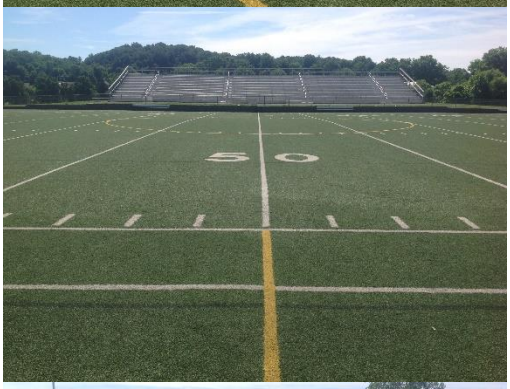
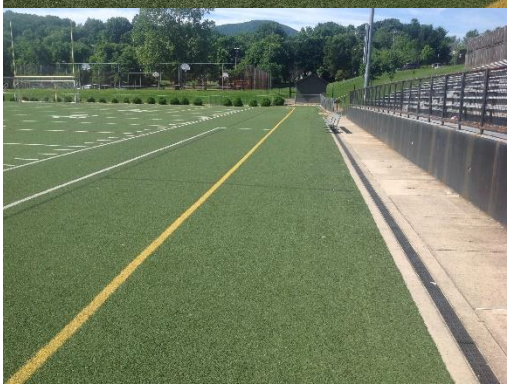
G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Cave Spring MS Stadium **Date of Test: 6/5/18** **Report No.: 18-023B-1**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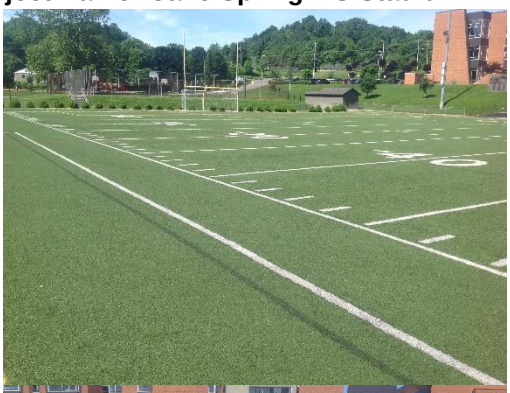
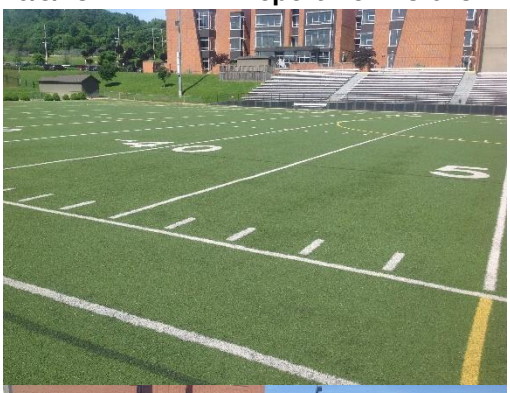
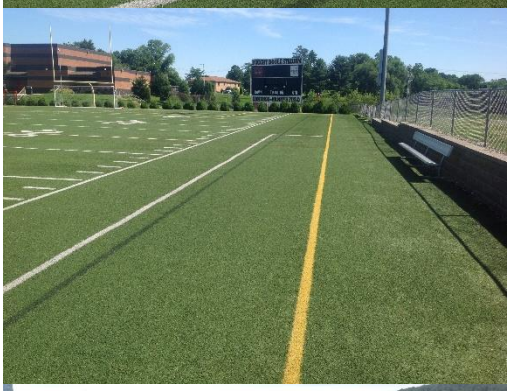
G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Cave Spring MS Stadium **Date of Test: 6/5/18** **Report No.: 18-023B-1**





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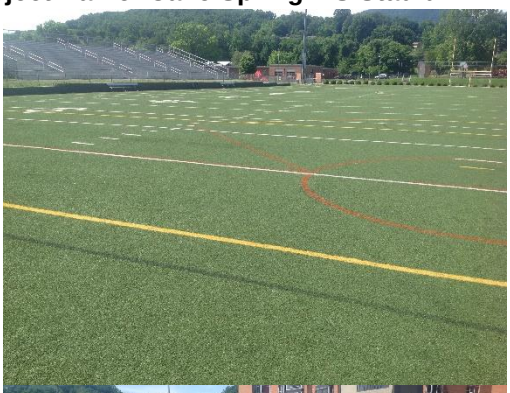
G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Cave Spring MS Stadium **Date of Test: 6/5/18** **Report No.: 18-023B-1**





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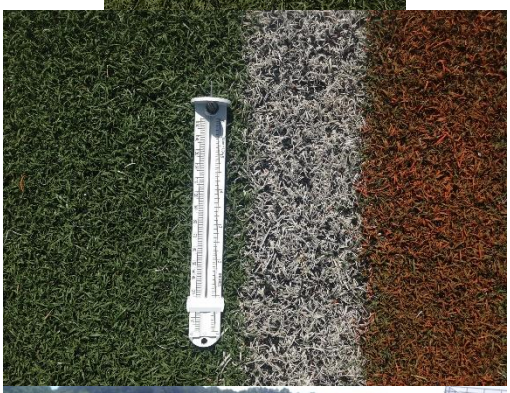
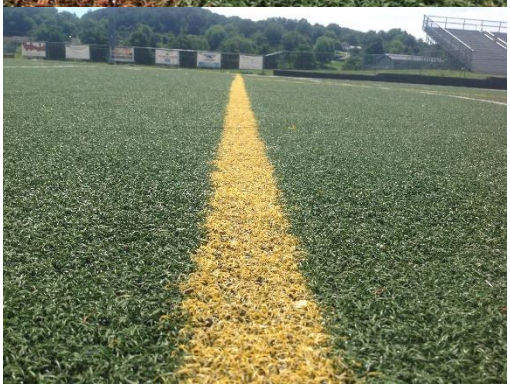
G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Cave Spring MS Stadium **Date of Test: 6/5/18** **Report No.: 18-023B-1**





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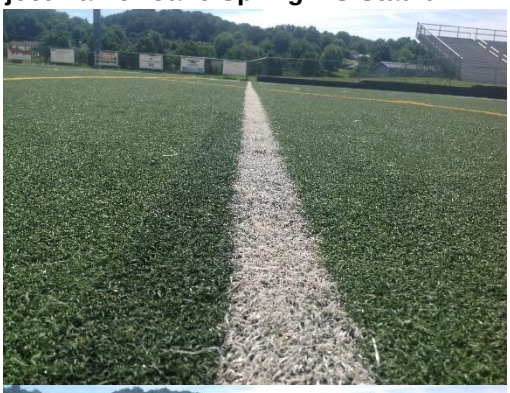
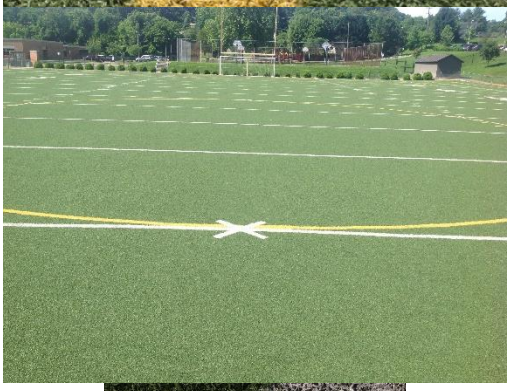
G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Cave Spring MS Stadium **Date of Test: 6/5/18** **Report No.: 18-023B-1**





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G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Cave Spring MS Stadium **Date of Test: 6/5/18** **Report No.: 18-023B-1**








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G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Cave Spring MS Stadium **Date of Test: 6/5/18** **Report No.: 18-023B-1**

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G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Cave Spring MS Stadium **Date of Test: 6/5/18** **Report No.: 18-023B-1**

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Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Test Performed By: Jeff Clise
on behalf of Athletic Field Consultants, Inc.

Report No.: 18-018A-1

General Project Information

Date of Test: 6/4/2018 (warm, sunny, breezy)

Project Name: Northside High School Stadium
Project Address: 6758 Northside High School Road, Roanoke, VA 24019
Contact Name: Justin Cornwell, Draper Aden Associates
Contact Phone: o 804-261-1843 c 804-869-8110
Contact Email: JCornwell@daa.com

Field Conditions and Description of Field on Date of Test

Field Play Configuration: Football, Soccer

Field Orientation: NW, SE (End to End)
Field Surface Type: Natural Grass Manufacturer: N/A Installation Date: N/A
Field Planarity: Noted in Observations/Recommendations

Test Point	Probe Depth (inches)	Temperature (F.) Air	Field	Drop No. 1	Drop No. 2	Drop No. 3	Average Drop (2 and 3)
1	2 ¾	80	82	63	55	52	54
2	6	80	88	53	51	49	50
3	6	80	92	51	54	54	54
4	6	80	92	51	52	51	52
5	6	80	85	65	68	67	68
6	6	80	87	98	106	107	107
7	3 ¼	80	84	65	71	71	71
8	4 ¾	80	87	73	73	71	72
9	6	80	89	60	57	54	56
10	6	80	96	49	49	49	49
Average GMAX Value for Entire Field							63
Values in Bold/Red Exceed the ASTM Maximum Allowed G-MAX of 200							
ASTM Specified Drop Height: 2' Producing an Impact Velocity 11.35 FPS ± 0.56							
Test Method: ASTM F 355, Test Method for Shock-Absorbing Properties of Playing Surface Systems and Materials. ASTM F1936-10, Standard Specification for Impact Attenuation of Turf Playing Systems as measured in the Field (G-MAX)							
Test equipment calibrated March 2017.							

Report Summary

Introduction:
An independent analysis of the natural grass playing surface, relative to gmax and general field conditions, was requested by the client. G-MAX Testing and Field Inspections were performed on the Northside High School Stadium Field on June 4, 2018.
Ten separate locations were tested for G-MAX values. Each test location had three G-MAX tests performed in order to obtain the average G-MAX. The tests were performed using ASTM certified and calibrated equipment, and were performed at locations on the field as determined by the ASTM F 1936-10 Specifications. The test results reported herein reflect the performance of the points tested at the time of testing and at the temperatures reported.

Findings/Recommendations:
No site abnormalities were found and there were no deviations from standard test procedures. All test points met the requirement of less than 200 average G-MAX when tested except for those indicated by Bold Red and shown in the Test Result G-Max Table.

Athletic Field Consultants, Inc.

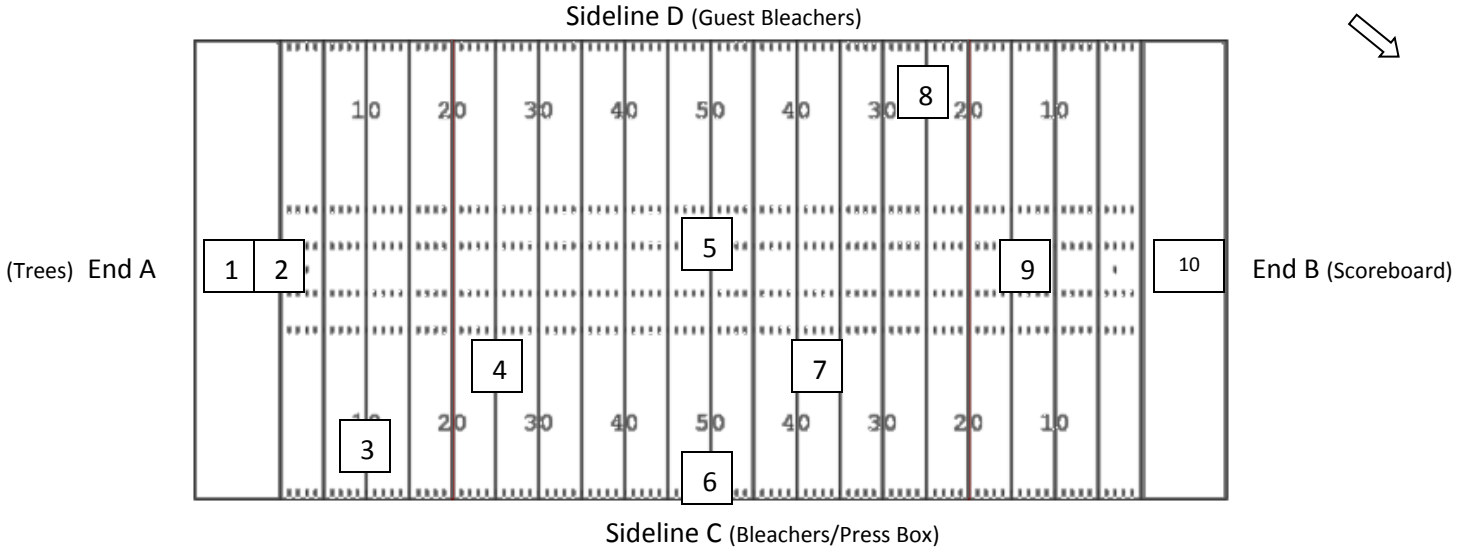
G-MAX Test and Field Inspection Report

Project Name: Northside High School Stadium

Report No.: 18-018A-1

Date of Test: 6/4/2018

Test Point Location Diagram (Football Field)



Test No.	Test Point Location Description
1	End Zone A 6'From Goal Line Along Center Line of Field
2	End Zone A Goal Line at Center of Field
3	End A 10 Yard Line at Numbers Along Sideline C
4	End A 25 Yard Line at the Hash Marks Along Sideline C
5	50 Yard Line at Center of Field
6	50 Yard Line at Side Line C
7	End B 35 Yard Line at the Hash Marks Along Sideline C
8	End B 25 Yard Line at the Numbers Along Sideline D
9	End B 12 Yard Line Center of Field
10	End Zone B 6' From Back of End Zone Along Center Line of Field

*All test point locations are in accordance with ASTM specifications, but performed in sequence determined by tester.

Contact Discussions

Field Use: Football, Soccer
Frequency of Use: Unknown
Maintenance Schedule: Unknown
Maintenance Equipment: Unknown

Turf Condition (Standing, Starting to Lay Over, Laying Over, Excess Fiber Wear, Inlays)

Goal Area: N/A
Creases/Penalty Kick: N/A
Center Field: N/A
Logo/Colored Areas: N/A
Sidelines: N/A
Inlays: N/A
Access Points to Field: N/A

General

Field Accessibility: Multiple
Field Security: Fence
Sporting Event Accessories and Maintenance Equipment Storage: Off Field

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Observations/Recommendations: While the field appears to be grass covered in general, there are many places where the grass is sparse or baron in the high wear areas (front of goals, penalty kicks, center of field), as well as other areas of the field, including the sidelines. This can easily be seen in the overhead photos on page 11 of this report. At the time of testing, the soil was relatively moist due to many previous days of rain. The depth gauge probe was able to penetrate into the soil from 2 ¾ to 6 inches in various locations, as reflected in the chart on page 1 of this report. Although the field meets the ASTM standard relative to GMAX at this time, it is important to remember that the soil composition and amount of moisture in a natural grass field have a direct impact on these results. It should also be noted that there are numerous subtle planarity changes across the field. It is evident from the surface of the soil that rain water ponds in the low areas. Additionally, the irregular transition from the fully grass covered areas to the sparse and baron areas affect the footing of the athlete and the potential for injuries to the lower body extremities.

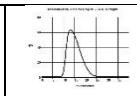
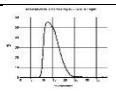
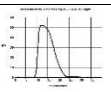
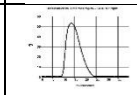
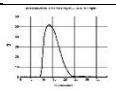
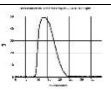
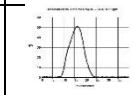
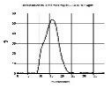
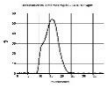
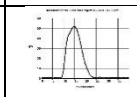
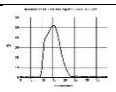
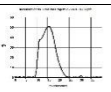
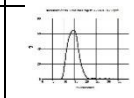
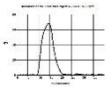
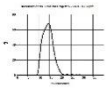
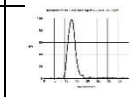
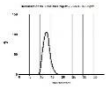
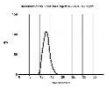
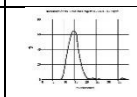
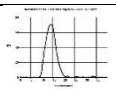
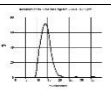
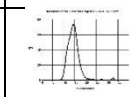
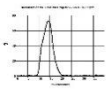
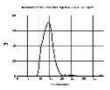
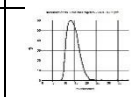
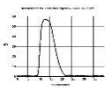
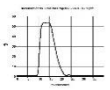
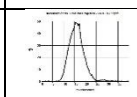
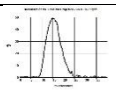
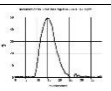
Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Impact Test Data
(Acceleration Time Curve)

Project Name: Northside HS Stadium
Report No.: 18-018A-1

Date of Test: 6/4/2018
Test Performed By: Jeff Clise

Test Point No. 1 Drop Point No. 1		Test Point No.1 Drop Point No. 2		Test Point No.1 Drop Point No. 3	
Test Point No. 2 Drop Point No. 1		Test Point No. 2 Drop Point No. 2		Test Point No. 2 Drop Point No. 3	
Test Point No. 3 Drop Point No. 1		Test Point No. 3 Drop Point No. 2		Test Point No. 3 Drop Point No. 3	
Test Point No. 4 Drop Point No. 1		Test Point No. 4 Drop Point No. 2		Test Point No. 4 Drop Point No. 3	
Test Point No. 5 Drop Point No. 1		Test Point No. 5 Drop Point No. 2		Test Point No. 5 Drop Point No. 3	
Test Point No. 6 Drop Point No. 1		Test Point No. 6 Drop Point No. 2		Test Point No. 6 Drop Point No. 3	
Test Point No. 7 Drop Point No. 1		Test Point No. 7 Drop Point No. 2		Test Point No. 7 Drop Point No. 3	
Test Point No. 8 Drop Point No. 1		Test Point No. 8 Drop Point No. 2		Test Point No. 8 Drop Point No. 3	
Test Point No. 9 Drop Point No. 1		Test Point No. 9 Drop Point No. 2		Test Point No. 9 Drop Point No. 3	
Test Point No. 10 Drop Point No. 1		Test Point No. 10 Drop Point No. 2		Test Point No. 10 Drop Point No. 3	

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Test Point Location Photographs

Project Name: Northside High School Stadium

Date of Test: 6/4/2018

Report No.: 18-018A-1

Test No. 1

Test No. 2

Test No. 3

Test No. 4

Test No. 5

Test No. 6

Test No. 7

Test No. 8

Test No. 9

Test No. 10

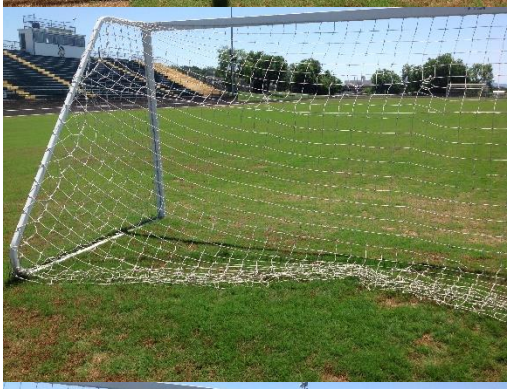
Athletic Field Consultants, Inc.

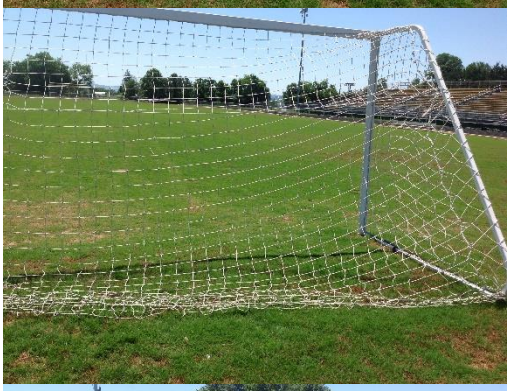
G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Northside HS Stadium **Date of Test: 6/4/18** **Report No.: 18-018A-1**





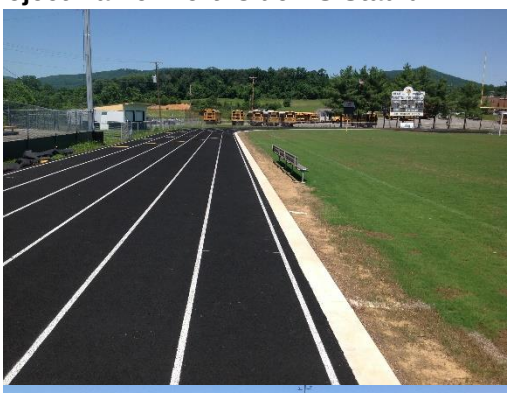


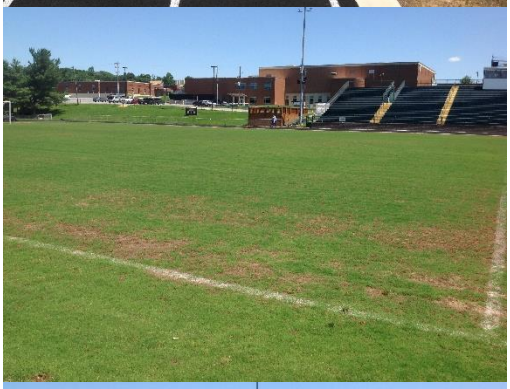
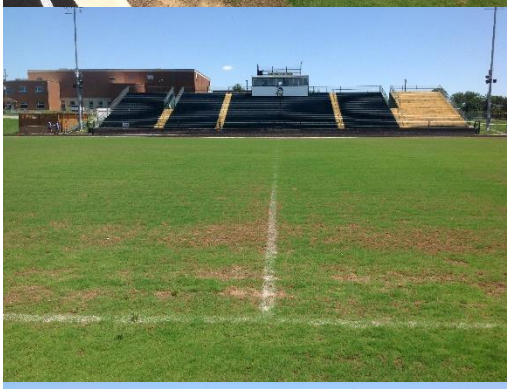

Athletic Field Consultants, Inc.

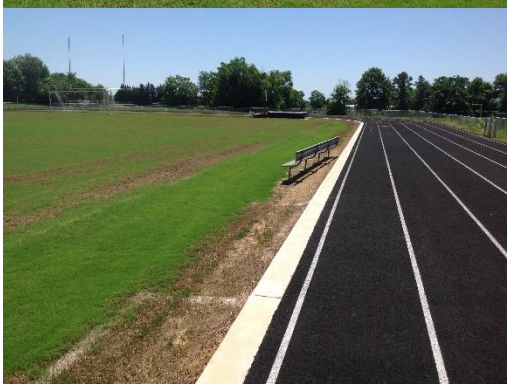
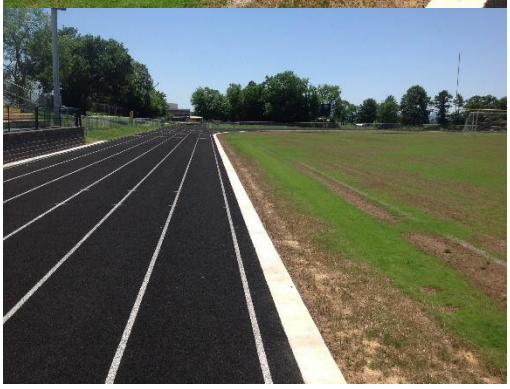
G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Northside HS Stadium **Date of Test: 6/4/18** **Report No.: 18-018A-1**



Athletic Field Consultants, Inc.

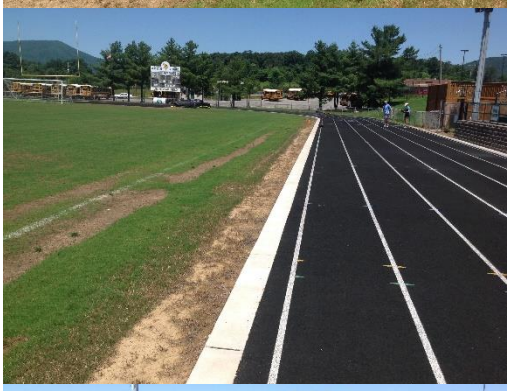
G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Northside HS Stadium **Date of Test: 6/4/18** **Report No.: 18-018A-1**





Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Northside HS Stadium **Date of Test: 6/4/18** **Report No.: 18-018A-1**








Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Northside HS Stadium **Date of Test: 6/4/18** **Report No.: 18-018A-1**

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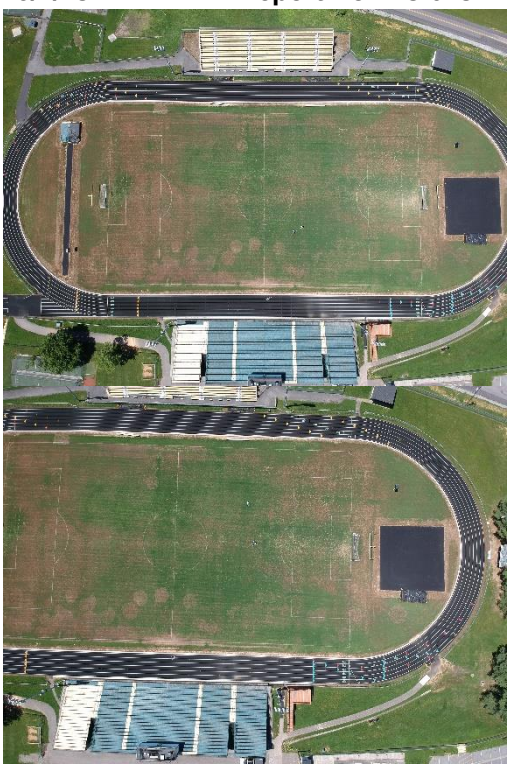
Jeff Clise (301) 908-3526

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Northside HS Stadium **Date of Test: 6/4/18** **Report No.: 18-018A-1**



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Jeff Clise (301) 908-3526

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Test Performed By: Jeff Clise
on behalf of Athletic Field Consultants, Inc.

Report No.: 18-018B-1

General Project Information

Date of Test: 6/4/2018 (warm, sunny, breezy)

Project Name: Northside High School Soccer Field
Project Address: 6758 Northside High School Road, Roanoke, VA 24019
Contact Name: Justin Cornwell, Draper Aden Associates
Contact Phone: o 804-261-1843 c 804-869-8110
Contact Email: JCornwell@daa.com

Field Conditions and Description of Field on Date of Test

Field Play Configuration: Soccer

Field Orientation: NE, SW (End to End)
Field Surface Type: Natural Grass Manufacturer: N/A Installation Date: N/A
Field Planarity: noted in Observations/Recommendations

Test Point	Probe Depth (inches)	Temperature (F.) Air	Field	Drop No. 1	Drop No. 2	Drop No. 3	Average Drop (2 and 3)
1	2 ½	80	92	87	90	92	91
2	2 ½	80	88	79	87	89	88
3	6	80	91	77	89	92	91
4	2 ½	80	93	97	110	110	110
5	6	80	94	65	81	87	84
6	6	80	88	73	82	85	84
7	6	80	83	60	72	76	74
8	2 ½	80	91	85	98	100	99
9	6	80	95	65	76	78	77
10	4	80	91	76	93	101	97
Average GMAX Value for Entire Field							90
Values in Bold/Red Exceed the ASTM Maximum Allowed G-MAX of 200							
ASTM Specified Drop Height: 2' Producing an Impact Velocity 11.35 FPS ± 0.56							
Test Method: ASTM F 355, Test Method for Shock-Absorbing Properties of Playing Surface Systems and Materials. ASTM F1936-10, Standard Specification for Impact Attenuation of Turf Playing Systems as measured in the Field (G-MAX)							
Test equipment calibrated March 2017.							

Report Summary

Introduction:
An independent analysis of the natural grass playing surface, relative to gmax and general field conditions, was requested by the client. G-MAX Testing and Field Inspections were performed on the Northside High School Soccer Field on June 4, 2018.
Ten separate locations were tested for G-MAX values. Each test location had three G-MAX tests performed in order to obtain the average G-MAX. The tests were performed using ASTM certified and calibrated equipment, and were performed at locations on the field as determined by the ASTM F 1936-10 Specifications. The test results reported herein reflect the performance of the points tested at the time of testing and at the temperatures reported.

Findings/Recommendations:
No site abnormalities were found and there were no deviations from standard test procedures. All test points met the requirement of less than 200 average G-MAX when tested except for those indicated by Bold Red and shown in the Test Result G-Max Table.

Athletic Field Consultants, Inc.

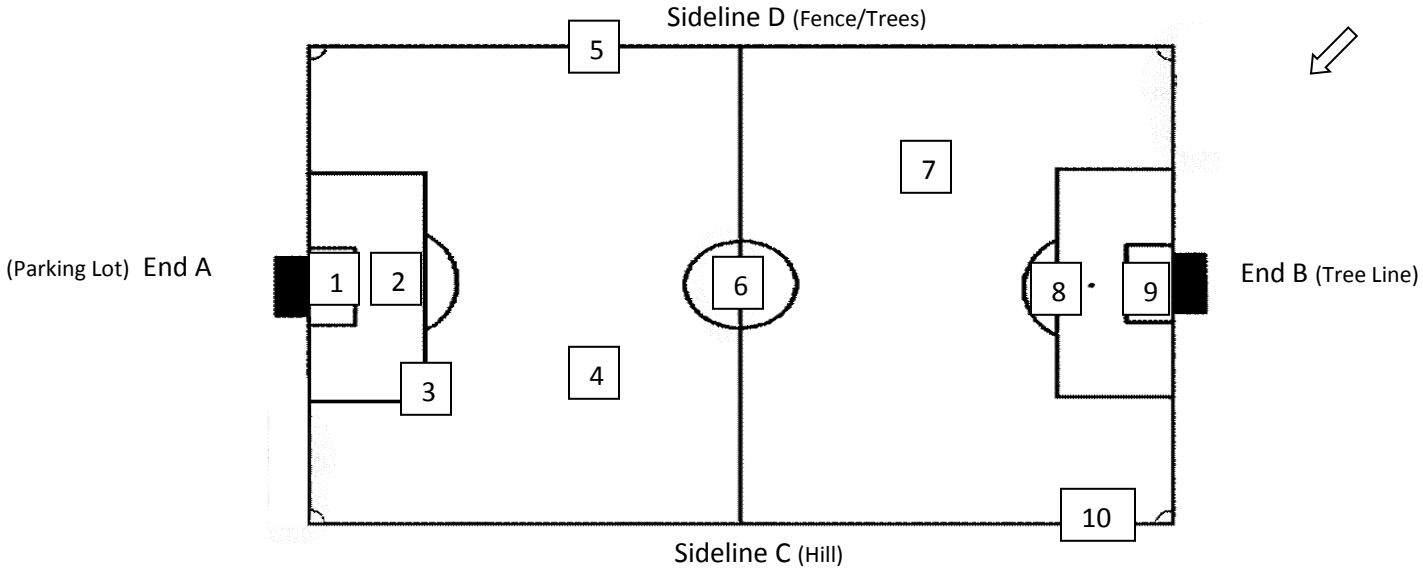
G-MAX Test and Field Inspection Report

Project Name: Northside High School Soccer Field

Report No.: 18-018B-1

Date of Test: 6/4/2018

Test Point Location Diagram (Soccer Field)



Test No.	Test Point Location Description
1	3 ft. from Goal Line to Half-Way Line, End A, Center of Field
2	Penalty Kick Line, End A, Center of Field
3	63 ft. from Center of Field to Corner of Penalty Box, Touch Line C, End A
4	75 ft. from Half-Way Line to End A, 40 ft from Center of Field to Touch Line C
5	75 ft. from Half-Way Line to End A at Sideline D
6	Half-Way Line, Center of Field
7	75 ft. from Half-Way Line to End B, 63 ft from Center of Field to Touch Line D
8	½ the distance from Penalty Restraining Arc to leading edge of Penalty Box at End B, Center of Field
9	15 ft. from Goal Line to Half-Way Line, End B, Center of Field
10	30 ft. from Goal Line to Half-Way Line, End B at Touch Line C

*All test point locations are in accordance with ASTM specifications, but performed in sequence determined by tester.

Contact Discussions

Field Use: Soccer

Frequency of Use: Unknown

Maintenance Schedule: Unknown

Maintenance Equipment: Unknown

Turf Condition (Standing, Starting to Lay Over, Laying Over, Excess Fiber Wear, Inlays)

Goal Area: N/A

Creases/Penalty Kick: N/A

Center Field: N/A

Logo/Colored Areas: N/A

Sidelines: N/A

Inlays: N/A

Access Points to Field: N/A

General

Field Accessibility: Multiple

Field Security: None

Sporting Event Accessories and Maintenance Equipment Storage: Off Field

Observations/Recommendations: While the field appears to be grass covered in general, there are many places where the grass is sparse or baron in the high wear areas (front of goals, penalty kicks, center of field) as well as other areas of the field, including the sidelines. This can easily be seen in the overhead photos on pages 11 and 12 of this report. At the time of testing, the soil was relatively moist due to many previous days of rain. The depth gauge probe was able to penetrate into the soil from 2 ½ to 6 inches in various locations, as reflected in the chart on page one of this report. Although the field meets the ASTM standard relative to GMAX at this time, it is important to remember that the soil composition and amount of moisture in a natural grass field have a direct impact on these results. It should also be noted that there are numerous subtle planarity changes across the field. It is evident from the surface of the soil that rain ponds in the low areas. Additionally, the irregular transition from the fully grass covered areas to the sparse and baron areas affect the footing of the athlete and the potential for injuries to the lower body extremities.

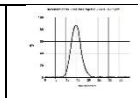
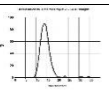
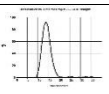
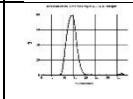
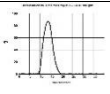
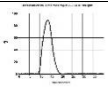
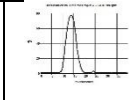
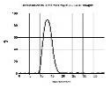
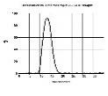
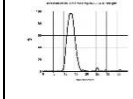
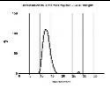
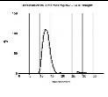
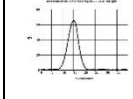
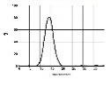
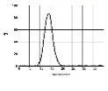
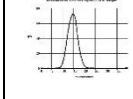
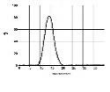
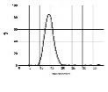
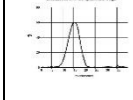
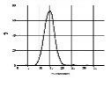
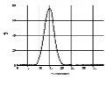
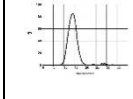
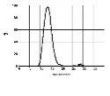
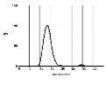
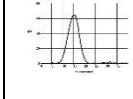
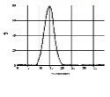
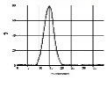
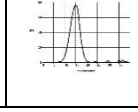
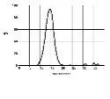
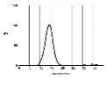
Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Impact Test Data
(Acceleration Time Curve)

Project Name: Northside HS Soccer Field
Report No.: 18-018B-1

Date of Test: 6/4/2018
Test Performed By: Jeff Clise

Test Point No. 1 Drop Point No. 1		Test Point No.1 Drop Point No. 2		Test Point No.1 Drop Point No. 3	
Test Point No. 2 Drop Point No. 1		Test Point No. 2 Drop Point No. 2		Test Point No. 2 Drop Point No. 3	
Test Point No. 3 Drop Point No. 1		Test Point No. 3 Drop Point No. 2		Test Point No. 3 Drop Point No. 3	
Test Point No. 4 Drop Point No. 1		Test Point No. 4 Drop Point No. 2		Test Point No. 4 Drop Point No. 3	
Test Point No. 5 Drop Point No. 1		Test Point No. 5 Drop Point No. 2		Test Point No. 5 Drop Point No. 3	
Test Point No. 6 Drop Point No. 1		Test Point No. 6 Drop Point No. 2		Test Point No. 6 Drop Point No. 3	
Test Point No. 7 Drop Point No. 1		Test Point No. 7 Drop Point No. 2		Test Point No. 7 Drop Point No. 3	
Test Point No. 8 Drop Point No. 1		Test Point No. 8 Drop Point No. 2		Test Point No. 8 Drop Point No. 3	
Test Point No. 9 Drop Point No. 1		Test Point No. 9 Drop Point No. 2		Test Point No. 9 Drop Point No. 3	
Test Point No. 10 Drop Point No. 1		Test Point No. 10 Drop Point No. 2		Test Point No. 10 Drop Point No. 3	

Athletic Field Consultants, Inc.

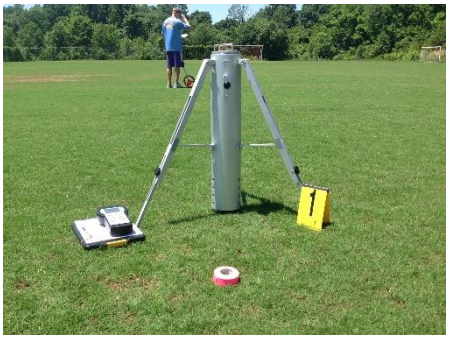
G-MAX Test and Field Inspection Report

Test Point Location Photographs

Project Name: Northside High School Soccer Field

Date of Test: 6/4/2018

Report No.: 18-018B-1



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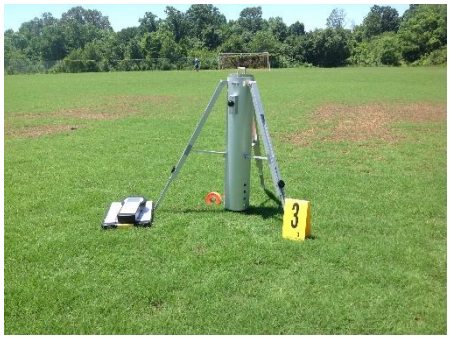
Test No. 2



Test No. 3

Test No. 4

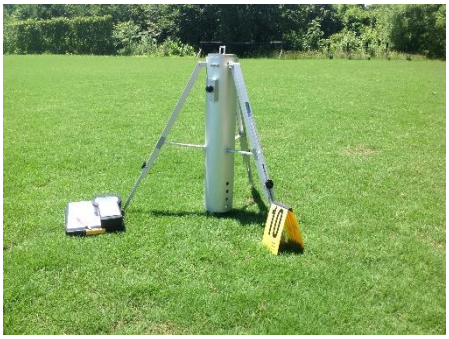
Test No. 5

Test No. 6

Test No. 7

Test No. 8

Test No. 9



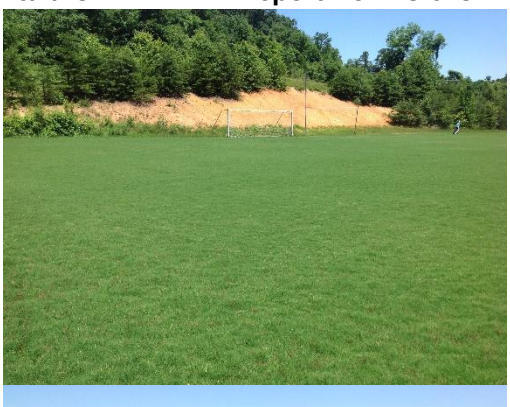
Test No. 10

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Northside HS Soccer Field **Date of Test: 6/4/18** **Report No.: 18-018B-1**





Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Northside HS Soccer Field **Date of Test: 6/4/18** **Report No.: 18-018B-1**








Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Northside HS Soccer Field **Date of Test: 6/4/18** **Report No.: 18-018B-1**








Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Northside HS Soccer Field **Date of Test: 6/4/18** **Report No.: 18-018B-1**








Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Northside HS Soccer Field **Date of Test: 6/4/18** **Report No.: 18-018B-1**








Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Northside HS Soccer Field **Date of Test: 6/4/18** **Report No.: 18-018B-1**

Athletic Field Consultants, Inc. · P. O. Box 323, Queenstown, MD 21658 · athleticfieldconsultantsinc@gmail.com
Jeff Clise (301) 908-3526

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Northside HS Soccer Field **Date of Test: 6/4/18** **Report No.: 18-018B-1**

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Test Performed By: Jeff Clise
on behalf of Athletic Field Consultants, Inc.

Report No.: 18-019-1

General Project Information

Date of Test: 6/4/2018 (warm, sunny, breezy)

Project Name: Northside Middle School Football Practice Field
Project Address: 6810 Northside High School Road, Roanoke, VA 24019
Contact Name: Justin Cornwell, Draper Aden Associates
Contact Phone: o 804-261-1843 c 804-869-8110
Contact Email: JCornwell@daa.com

Field Conditions and Description of Field on Date of Test

Field Play Configuration: Football

Field Orientation: E, W (End to End)
Field Surface Type: Natural Grass Manufacturer: N/A Installation Date: N/A
Field Planarity: Noted in Observations/Recommendations

Test Point	Probe Depth (inches)	Temperature (F.) Air	Field	Drop No. 1	Drop No. 2	Drop No. 3	Average Drop (2 and 3)
1	6	80	77	69	73	74	74
2	2	80	86	68	74	75	75
3	6	80	93	56	60	59	60
4	3	80	92	55	59	58	59
5	3 ¼	80	93	54	62	64	63
6	3 ¼	80	91	63	68	68	68
7	6	80	92	52	57	57	57
8	6	80	91	55	60	61	61
9	6	80	91	54	57	56	57
10	6	80	92	65	67	65	66
Average GMAX Value for Entire Field							64
Values in Bold/Red Exceed the ASTM Maximum Allowed G-MAX of 200							
ASTM Specified Drop Height: 2' Producing an Impact Velocity 11.35 FPS ± 0.56							
Test Method: ASTM F 355, Test Method for Shock-Absorbing Properties of Playing Surface Systems and Materials. ASTM F1936-10, Standard Specification for Impact Attenuation of Turf Playing Systems as measured in the Field (G-MAX)							
Test equipment calibrated March 2017.							

Report Summary

Introduction:
An independent analysis of the natural grass playing surface, relative to gmax and general field conditions, was requested by the client. G-MAX Testing and Field Inspections were performed on the Northside Middle School Football Practice Field on June 4, 2018.
Ten separate locations were tested for G-MAX values. Each test location had three G-MAX tests performed in order to obtain the average G-MAX. The tests were performed using ASTM certified and calibrated equipment, and were performed at locations on the field as determined by the ASTM F 1936-10 Specifications. The test results reported herein reflect the performance of the points tested at the time of testing and at the temperatures reported.

Findings/Recommendations:
No site abnormalities were found and there were no deviations from standard test procedures. All test points met the requirement of less than 200 average G-MAX when tested except for those indicated by Bold Red and shown in the Test Result G-Max Table.

Athletic Field Consultants, Inc.

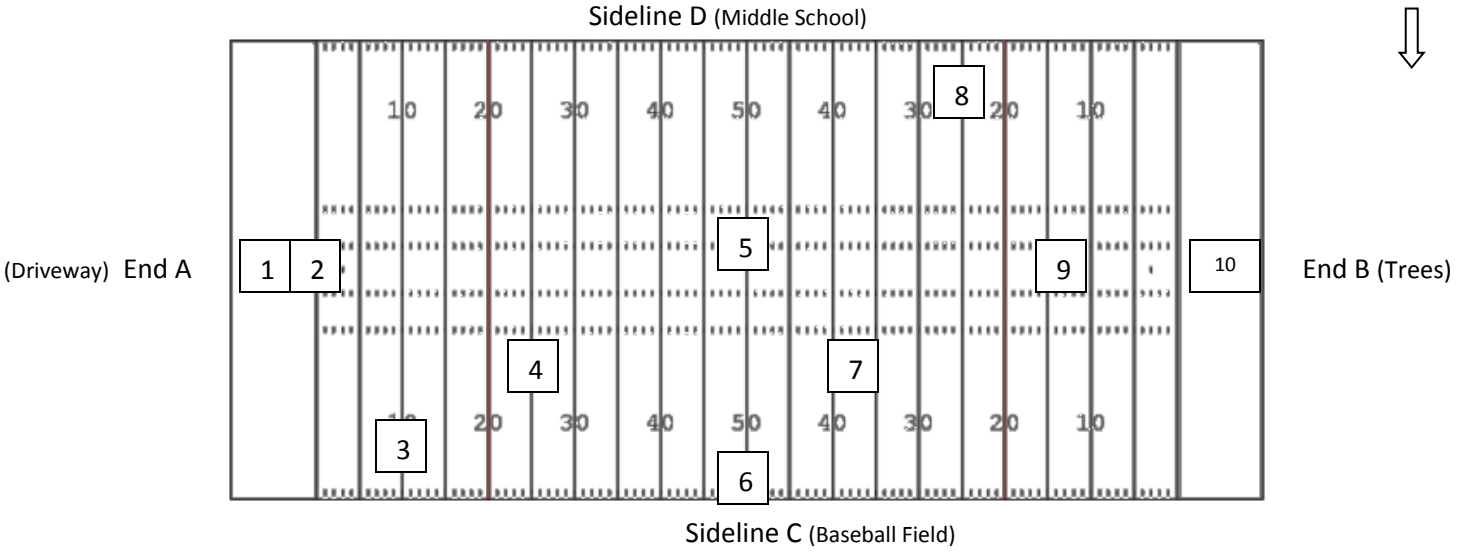
G-MAX Test and Field Inspection Report

Project Name: Northside Middle School Football Practice Field

Report No.: 18-019-1

Date of Test: 6/4/2018

Test Point Location Diagram (Football Field)



Test No.	Test Point Location Description
1	End Zone A 6'From Goal Line Along Center Line of Field
2	End Zone A Goal Line at Center of Field
3	End A 10 Yard Line at Numbers Along Sideline C
4	End A 25 Yard Line at the Hash Marks Along Sideline C
5	50 Yard Line at Center of Field
6	50 Yard Line at Side Line C
7	End B 35 Yard Line at the Hash Marks Along Sideline C
8	End B 25 Yard Line at the Numbers Along Sideline D
9	End B 12 Yard Line Center of Field
10	End Zone B 6' From Back of End Zone Along Center Line of Field

*All test point locations are in accordance with ASTM specifications, but performed in sequence determined by tester.

Contact Discussions

Field Use: Football
Frequency of Use: Unknown
Maintenance Schedule: Unknown
Maintenance Equipment: Unknown

Turf Condition (Standing, Starting to Lay Over, Laying Over, Excess Fiber Wear, Inlays)

Goal Area: N/A
Creases/Penalty Kick: N/A
Center Field: N/A
Logo/Colored Areas: N/A
Sidelines: N/A
Inlays: N/A
Access Points to Field: N/A

General

Field Accessibility: Multiple
Field Security: Fence
Sporting Event Accessories and Maintenance Equipment Storage: Off Field

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Observations/Recommendations: The field appears to be mostly grass covered with areas where the grass is sparse or baron in the high wear areas (front of goals, penalty kicks, center of field) as well as other areas of the field. This can be seen in the overhead photos on page 11 of this report. The field was not mowed at the time of testing, which made it difficult to evaluate. At the time of testing, the soil was relatively moist due to many previous days of rain. The depth gauge probe was able to penetrate into the soil from 2 to 6 inches in various locations, as reflected in the chart on page 1 of this report. Although the field meets the ASTM standard relative to GMAX at this time, it is important to remember that the soil composition and amount of moisture in a natural grass field have a direct impact on these results. It should also be noted that there are numerous subtle planarity changes across the field. It is evident from the surface of the soil that rain water ponds in the low areas. Additionally, the irregular transition from the fully grass covered areas to the sparse and baron areas affect the footing of the athlete and the potential for injuries to the lower body extremities.

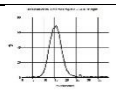
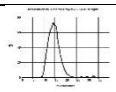
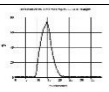
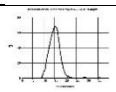
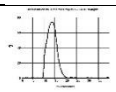
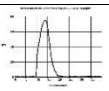
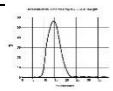
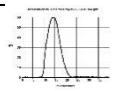
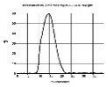
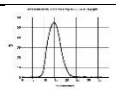
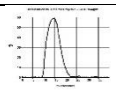
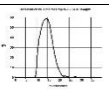
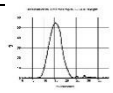
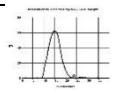
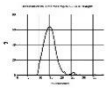
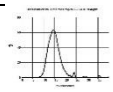
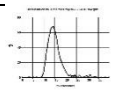
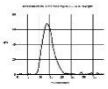
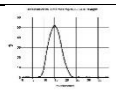
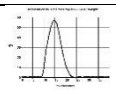
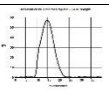
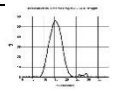
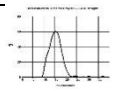
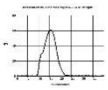
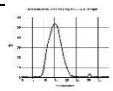
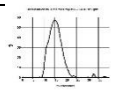
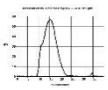
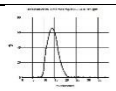
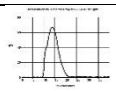
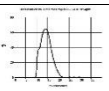
Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Impact Test Data
(Acceleration Time Curve)

Project Name: Northside MS FB Practice
Report No.: 18-019-1

Date of Test: 6/4/2018
Test Performed By: Jeff Clise

Test Point No. 1 Drop Point No. 1		Test Point No.1 Drop Point No. 2		Test Point No.1 Drop Point No. 3	
Test Point No. 2 Drop Point No. 1		Test Point No. 2 Drop Point No. 2		Test Point No. 2 Drop Point No. 3	
Test Point No. 3 Drop Point No. 1		Test Point No. 3 Drop Point No. 2		Test Point No. 3 Drop Point No. 3	
Test Point No. 4 Drop Point No. 1		Test Point No. 4 Drop Point No. 2		Test Point No. 4 Drop Point No. 3	
Test Point No. 5 Drop Point No. 1		Test Point No. 5 Drop Point No. 2		Test Point No. 5 Drop Point No. 3	
Test Point No. 6 Drop Point No. 1		Test Point No. 6 Drop Point No. 2		Test Point No. 6 Drop Point No. 3	
Test Point No. 7 Drop Point No. 1		Test Point No. 7 Drop Point No. 2		Test Point No. 7 Drop Point No. 3	
Test Point No. 8 Drop Point No. 1		Test Point No. 8 Drop Point No. 2		Test Point No. 8 Drop Point No. 3	
Test Point No. 9 Drop Point No. 1		Test Point No. 9 Drop Point No. 2		Test Point No. 9 Drop Point No. 3	
Test Point No. 10 Drop Point No. 1		Test Point No. 10 Drop Point No. 2		Test Point No. 10 Drop Point No. 3	

Athletic Field Consultants, Inc.

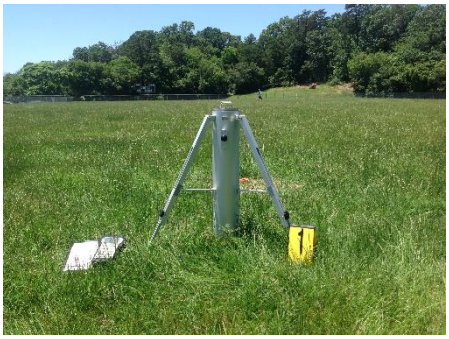
G-MAX Test and Field Inspection Report

Test Point Location Photographs

Project Name: Northside Middle School Football Practice Field

Date of Test: 6/4/2018

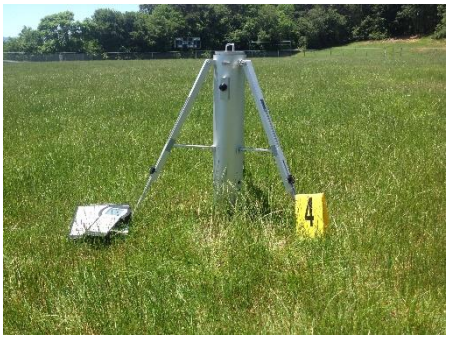
Report No.: 18-019-1



Test No. 1

Test No. 2

Test No. 3



Test No. 4

Test No. 5

Test No. 6

Test No. 7

Test No. 8

Test No. 9

Test No. 10

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Northside MS FB Practice Field **Date of Test: 6/4/18** **Report No.: 18-019-1**








Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Northside MS FB Practice Field **Date of Test: 6/4/18** **Report No.: 18-019-1**








Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Northside MS FB Practice Field **Date of Test: 6/4/18** **Report No.: 18-019-1**








Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Northside MS FB Practice Field **Date of Test: 6/4/18** **Report No.: 18-019-1**








Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Northside MS FB Practice Field **Date of Test: 6/4/18** **Report No.: 18-019-1**








Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Northside MS FB Practice Field **Date of Test: 6/4/18** **Report No.: 18-019-1**

Athletic Field Consultants, Inc. · P. O. Box 323, Queenstown, MD 21658 · athleticfieldconsultantsinc@gmail.com
Jeff Clise (301) 908-3526

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Test Performed By: Jeff Clise
on behalf of Athletic Field Consultants, Inc.

Report No.: 18-021-1

General Project Information

Date of Test: 6/4/2018 (warm, sunny, breezy)

Project Name: William Byrd High School Stadium
Project Address: 2902 E Washington Avenue, Vinton, VA 24179
Contact Name: Justin Cornwell, Draper Aden Associates
Contact Phone: o 804-261-1843 c 804-869-8110
Contact Email: JCornwell@daa.com

Field Conditions and Description of Field on Date of Test

Field Play Configuration: Football, Soccer, (M & W Lacrosse – painted)

Field Orientation: NW, SE (End to End)
Field Surface Type: FTHD 1 Manufacturer: FieldTurf Installation Date: 7/2017
Field Planarity: no deviations noted

Test Point	Infill Depth (mm)	Temperature (F.) Air	Field	Drop No. 1	Drop No. 2	Drop No. 3	Average Drop (2 and 3)
1	44	84	97	118	120	118	119
2	45	84	103	117	126	125	126
3	45	84	100	114	123	123	123
4	45	84	100	117	126	125	126
5	45	84	95	120	128	127	128
6	45	84	102	110	117	117	117
7	45	84	97	131	143	143	143
8	46	84	100	113	120	119	120
9	45	84	97	125	135	136	136
10	45	84	99	119	132	133	133
Average GMAX Value for Entire Field							127
Values in Bold/Red Exceed the ASTM Maximum Allowed G-MAX of 200							
ASTM Specified Drop Height: 2' Producing an Impact Velocity 11.35 FPS ± 0.56							
Test Method: ASTM F 355, Test Method for Shock-Absorbing Properties of Playing Surface Systems and Materials. ASTM F1936-10, Standard Specification for Impact Attenuation of Turf Playing Systems as measured in the Field (G-MAX)							
Test equipment calibrated March 2017.							

Report Summary

Introduction:
An independent analysis of the FieldTurf synthetic playing surface, relative to gmax and general field conditions, was requested by the client. G-MAX Testing and Field Inspections were performed on the William Byrd High School Stadium Field on June 4, 2018.
Ten separate locations were tested for G-MAX values. Each test location had three G-MAX tests performed in order to obtain the average G-MAX. The tests were performed using ASTM certified and calibrated equipment, and were performed at locations on the field as determined by the ASTM F 1936-10 Specifications. The test results reported herein reflect the performance of the points tested at the time of testing and at the temperatures reported.

Findings/Recommendations:
No site abnormalities were found and there were no deviations from standard test procedures. All test points met the requirement of less than 200 average G-MAX when tested except for those indicated by Bold Red and shown in the Test Result G-Max Table.

Athletic Field Consultants, Inc.

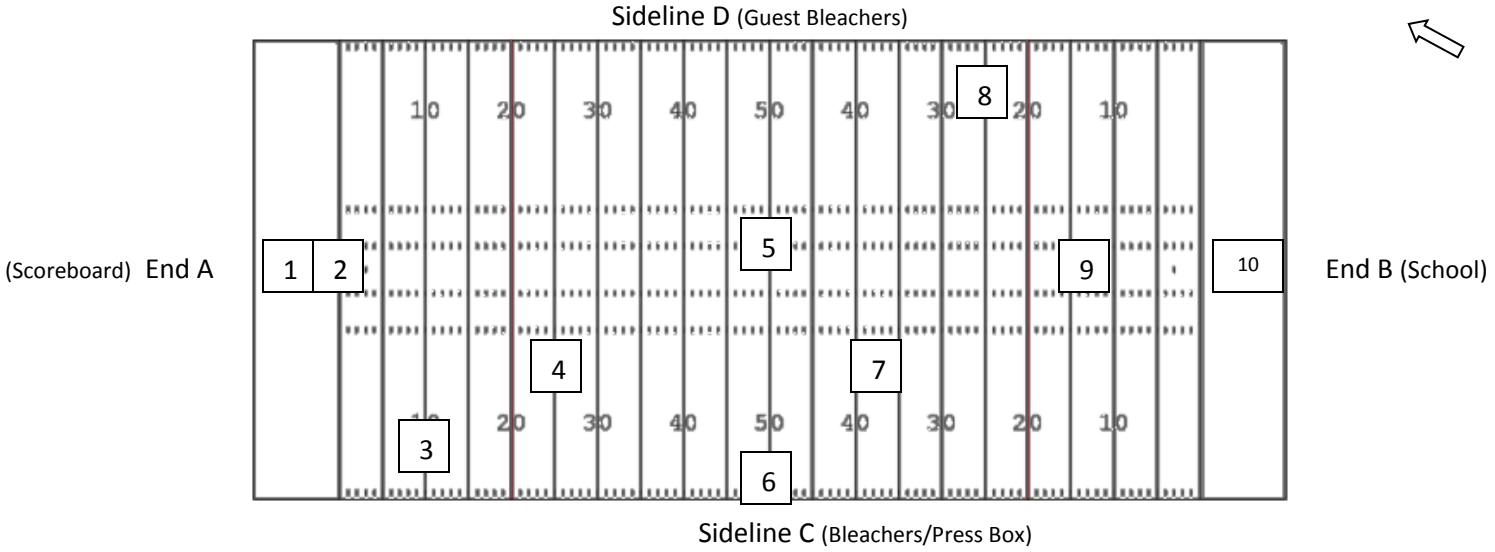
G-MAX Test and Field Inspection Report

Project Name: William Byrd High School Stadium

Report No.: 18-021-1

Date of Test: 6/4/2018

Test Point Location Diagram (Football Field)



Test No.	Test Point Location Description
1	End Zone A 6'From Goal Line Along Center Line of Field
2	End Zone A Goal Line at Center of Field
3	End A 10 Yard Line at Numbers Along Sideline C
4	End A 25 Yard Line at the Hash Marks Along Sideline C
5	50 Yard Line at Center of Field
6	50 Yard Line at Side Line C
7	End B 35 Yard Line at the Hash Marks Along Sideline C
8	End B 25 Yard Line at the Numbers Along Sideline D
9	End B 12 Yard Line Center of Field
10	End Zone B 6' From Back of End Zone Along Center Line of Field

*All test point locations are in accordance with ASTM specifications, but performed in sequence determined by tester.

Contact Discussions

Field Use: Football, Soccer, M & W Lacrosse
Frequency of Use: Unknown
Maintenance Schedule: Unknown
Maintenance Equipment: Unknown

Turf Condition (Standing, Starting to Lay Over, Laying Over, Excess Fiber Wear, Inlays)

Goal Area: Standing
Creases/Penalty Kick: Standing
Center Field: Standing
Logo/Colored Areas: Standing
Sidelines: Standing
Inlays: Standing
Access Points to Field: Standing

General

Field Accessibility: Multiple
Field Security: Fence
Sporting Event Accessories and Maintenance Equipment Storage: Off Field

Observations/Recommendations: Field looks great; there are no signs of wear, all colors are vibrant and there are no fiber slip lock issues. The infill is at the manufacturer's recommended depth, but should be monitored regularly in high wear areas (goals, creases, penalty kicks, center of field) and rubber added, as needed. Continue to groom per manufacturer's instructions and continue annual GMAX testing to ensure proper performance of field.

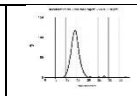
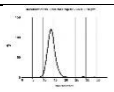
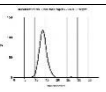
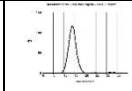
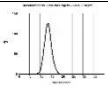
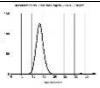
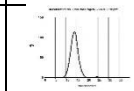
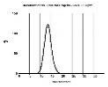
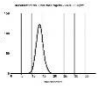
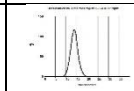
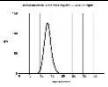
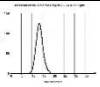
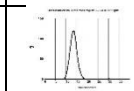
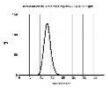
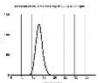
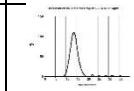
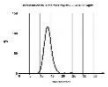
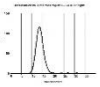
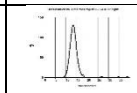
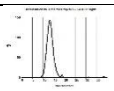
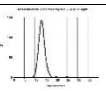
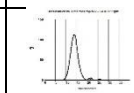
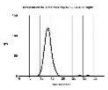
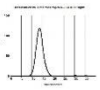
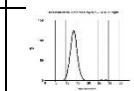
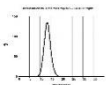
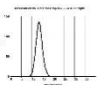
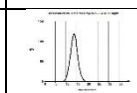
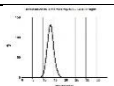
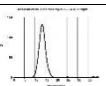
Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Impact Test Data
(Acceleration Time Curve)

Project Name: William Byrd HS Stadium
Report No.: 18-021-1

Date of Test: 6/4/2018
Test Performed By: Jeff Clise

Test Point No. 1 Drop Point No. 1		Test Point No.1 Drop Point No. 2		Test Point No.1 Drop Point No. 3	
Test Point No. 2 Drop Point No. 1		Test Point No. 2 Drop Point No. 2		Test Point No. 2 Drop Point No. 3	
Test Point No. 3 Drop Point No. 1		Test Point No. 3 Drop Point No. 2		Test Point No. 3 Drop Point No. 3	
Test Point No. 4 Drop Point No. 1		Test Point No. 4 Drop Point No. 2		Test Point No. 4 Drop Point No. 3	
Test Point No. 5 Drop Point No. 1		Test Point No. 5 Drop Point No. 2		Test Point No. 5 Drop Point No. 3	
Test Point No. 6 Drop Point No. 1		Test Point No. 6 Drop Point No. 2		Test Point No. 6 Drop Point No. 3	
Test Point No. 7 Drop Point No. 1		Test Point No. 7 Drop Point No. 2		Test Point No. 7 Drop Point No. 3	
Test Point No. 8 Drop Point No. 1		Test Point No. 8 Drop Point No. 2		Test Point No. 8 Drop Point No. 3	
Test Point No. 9 Drop Point No. 1		Test Point No. 9 Drop Point No. 2		Test Point No. 9 Drop Point No. 3	
Test Point No. 10 Drop Point No. 1		Test Point No. 10 Drop Point No. 2		Test Point No. 10 Drop Point No. 3	

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Test Point Location Photographs

Project Name: William Byrd High School Stadium

Date of Test: 6/4/2018

Report No.: 18-021-1

Test No. 1

Test No. 2

Test No. 3

Test No. 4

Test No. 5

Test No. 6

Test No. 7

Test No. 8

Test No. 9

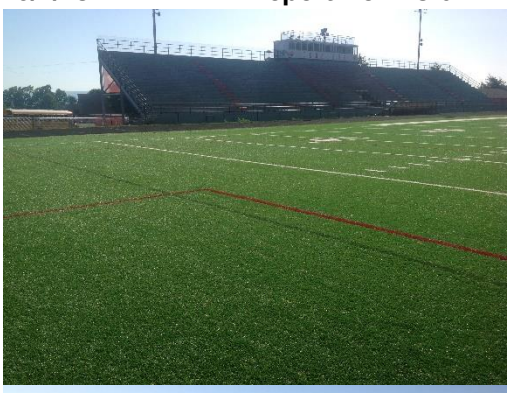
Test No. 10

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

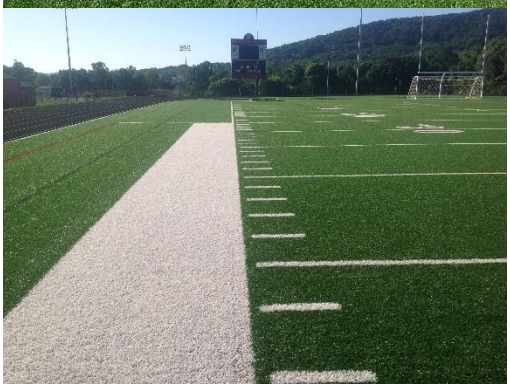
Location Photographs

Project Name: William Byrd HS Stadium **Date of Test: 6/4/18** **Report No.: 18-021-1**







Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: William Byrd HS Stadium **Date of Test: 6/4/18** **Report No.: 18-021-1**








Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

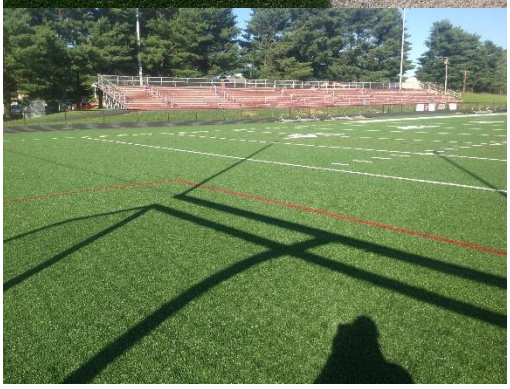
Location Photographs

Project Name: William Byrd HS Stadium **Date of Test: 6/4/18** **Report No.: 18-021-1**







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Jeff Clise (301) 908-3526

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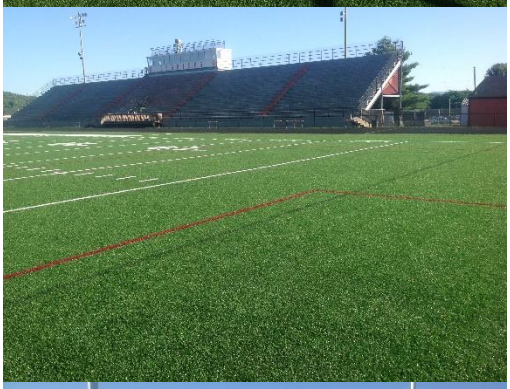
G-MAX Test and Field Inspection Report

Location Photographs

Project Name: William Byrd HS Stadium **Date of Test: 6/4/18** **Report No.: 18-021-1**





Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: William Byrd HS Stadium **Date of Test: 6/4/18** **Report No.: 18-021-1**





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G-MAX Test and Field Inspection Report

Location Photographs

Project Name: William Byrd HS Stadium **Date of Test: 6/4/18** **Report No.: 18-021-1**

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Test Performed By: Jeff Clise
on behalf of Athletic Field Consultants, Inc.

Report No.: 18-020A-1

General Project Information

Date of Test: 6/4/2018 (warm, sunny, breezy)

Project Name: Glenvar High School Stadium
Project Address: 4549 Malus Drive, Salem, VA 24153
Contact Name: Justin Cornwell, Draper Aden Associates
Contact Phone: o 804-261-1843 c 804-869-8110
Contact Email: JCornwell@daa.com

Field Conditions and Description of Field on Date of Test

Field Play Configuration: Football, Soccer

Field Orientation: NW, SE (End to End)
Field Surface Type: Natural Grass Manufacturer: N/A Installation Date: N/A
Field Planarity: Noted in Observations/Recommendations

Test Point	Probe Depth (inches)	Temperature (F.) Air	Field	Drop No. 1	Drop No. 2	Drop No. 3	Average Drop (2 and 3)
1	3	85	89	81	87	89	88
2	4	85	92	72	83	87	85
3	4	85	96	65	78	81	80
4	4 ½	85	93	70	76	78	77
5	3 ½	85	92	90	100	100	100
6	6	85	83	99	104	105	105
7	2	85	91	81	92	95	94
8	4	85	92	73	84	90	87
9	6	85	86	68	77	80	79
10	2 ½	85	92	81	94	98	96
Average GMAX Value for Entire Field							89
Values in Bold/Red Exceed the ASTM Maximum Allowed G-MAX of 200							
ASTM Specified Drop Height: 2' Producing an Impact Velocity 11.35 FPS ± 0.56							
Test Method: ASTM F 355, Test Method for Shock-Absorbing Properties of Playing Surface Systems and Materials. ASTM F1936-10, Standard Specification for Impact Attenuation of Turf Playing Systems as measured in the Field (G-MAX)							
Test equipment calibrated March 2017.							

Report Summary

Introduction:

An independent analysis of the natural grass playing surface, relative to gmax and general field conditions, was requested by the client. G-MAX Testing and Field Inspections were performed on the Glenvar High School Stadium Field on June 4, 2018.

Ten separate locations were tested for G-MAX values. Each test location had three G-MAX tests performed in order to obtain the average G-MAX. The tests were performed using ASTM certified and calibrated equipment, and were performed at locations on the field as determined by the ASTM F 1936-10 Specifications. The test results reported herein reflect the performance of the points tested at the time of testing and at the temperatures reported.

Findings/Recommendations:

No site abnormalities were found and there were no deviations from standard test procedures. All test points met the requirement of less than 200 average G-MAX when tested except for those indicated by Bold Red and shown in the Test Result G-Max Table.

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Project Name: Glenvar High School Stadium

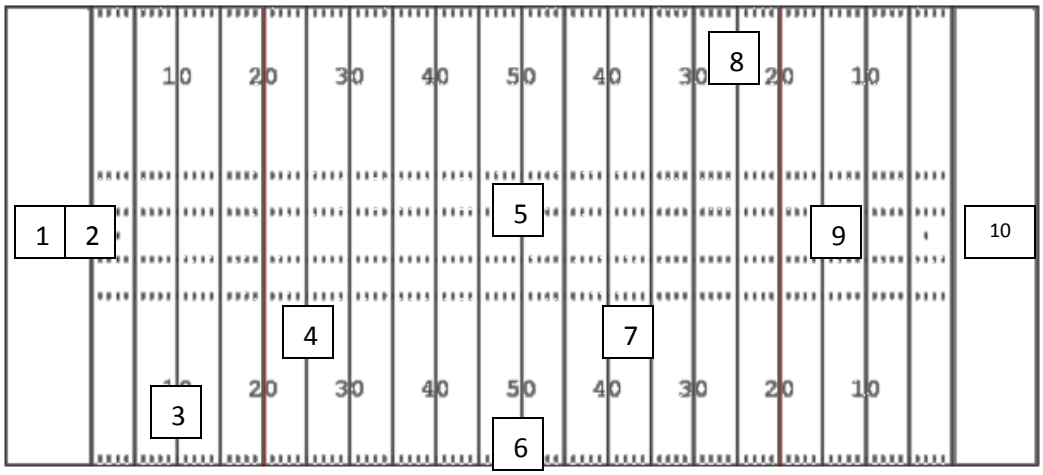
Report No.: 18-020A-1

Date of Test: 6/4/2018

Test Point Location Diagram (Football Field)

Sideline D (Bleachers/Press Box)

(Parking Lot) End A



End B (Scoreboard)

Sideline C (Guest Bleachers)

Test No.	Test Point Location Description
1	End Zone A 6'From Goal Line Along Center Line of Field
2	End Zone A Goal Line at Center of Field
3	End A 10 Yard Line at Numbers Along Sideline C
4	End A 25 Yard Line at the Hash Marks Along Sideline C
5	50 Yard Line at Center of Field
6	50 Yard Line at Side Line C
7	End B 35 Yard Line at the Hash Marks Along Sideline C
8	End B 25 Yard Line at the Numbers Along Sideline D
9	End B 12 Yard Line Center of Field
10	End Zone B 6' From Back of End Zone Along Center Line of Field

*All test point locations are in accordance with ASTM specifications, but performed in sequence determined by tester.

Contact Discussions

Field Use: Football

Frequency of Use: Unknown

Maintenance Schedule: Unknown

Maintenance Equipment: Unknown

Turf Condition (Standing, Starting to Lay Over, Laying Over, Excess Fiber Wear, Inlays)

Goal Area: N/A

Creases/Penalty Kick: N/A

Center Field: N/A

Logo/Colored Areas: N/A

Sidelines: N/A

Inlays: N/A

Access Points to Field: N/A

General

Field Accessibility: Multiple

Field Security: Fence

Sporting Event Accessories and Maintenance Equipment Storage: Off Field

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Jeff Clise (301) 908-3526

Observations/Recommendations: The field is mostly grass covered with minimal areas where the grass is sparse or baron in the high wear areas (front of goals, penalty kicks, creases, center of field) as well as other areas of the field. This can be seen in the overhead photos on pages 10 and 11 of this report. At the time of testing, the soil was relatively moist due to many previous days of rain. The depth gauge probe was able to penetrate into the soil from 2 to 6 inches in various locations, as reflected in the chart on page 1 of this report. Although the field meets the ASTM standard relative to GMAX at this time, it is important to remember that the soil composition and amount of moisture in a natural grass field have a direct impact on these results. It should also be noted that there is a large crown on this field as well as numerous planarity changes. It is evident from the surface of the soil that rain ponds in the low areas. Additionally, the irregular transition from the fully grass covered areas to the sparse and baron areas affect the footing of the athlete and the potential for injuries to the lower body extremities.

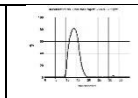
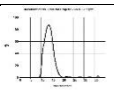
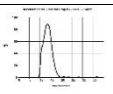
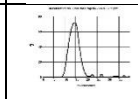
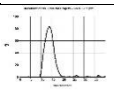
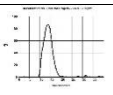
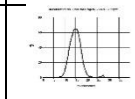
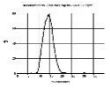
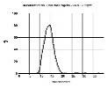
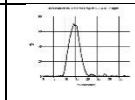
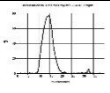
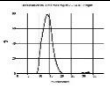
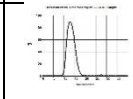
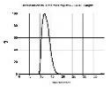
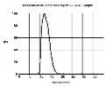
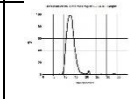
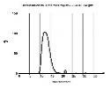
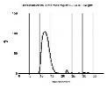
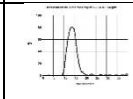
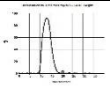
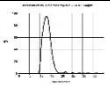
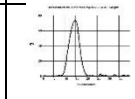
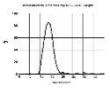
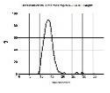
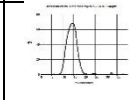
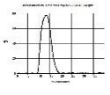
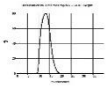
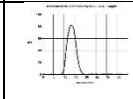
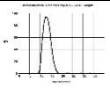
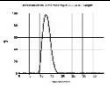
Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Impact Test Data
(Acceleration Time Curve)

Project Name: Glenvar HS Stadium
Report No.: 18-020A-1

Date of Test: 6/4/2018
Test Performed By: Jeff Clise

Test Point No. 1 Drop Point No. 1		Test Point No.1 Drop Point No. 2		Test Point No.1 Drop Point No. 3	
Test Point No. 2 Drop Point No. 1		Test Point No. 2 Drop Point No. 2		Test Point No. 2 Drop Point No. 3	
Test Point No. 3 Drop Point No. 1		Test Point No. 3 Drop Point No. 2		Test Point No. 3 Drop Point No. 3	
Test Point No. 4 Drop Point No. 1		Test Point No. 4 Drop Point No. 2		Test Point No. 4 Drop Point No. 3	
Test Point No. 5 Drop Point No. 1		Test Point No. 5 Drop Point No. 2		Test Point No. 5 Drop Point No. 3	
Test Point No. 6 Drop Point No. 1		Test Point No. 6 Drop Point No. 2		Test Point No. 6 Drop Point No. 3	
Test Point No. 7 Drop Point No. 1		Test Point No. 7 Drop Point No. 2		Test Point No. 7 Drop Point No. 3	
Test Point No. 8 Drop Point No. 1		Test Point No. 8 Drop Point No. 2		Test Point No. 8 Drop Point No. 3	
Test Point No. 9 Drop Point No. 1		Test Point No. 9 Drop Point No. 2		Test Point No. 9 Drop Point No. 3	
Test Point No. 10 Drop Point No. 1		Test Point No. 10 Drop Point No. 2		Test Point No. 10 Drop Point No. 3	

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Test Point Location Photographs

Project Name: Glenvar High School Stadium

Date of Test: 6/4/2018

Report No.: 18-020A-1

Test No. 1

Test No. 2

Test No. 3

Test No. 4

Test No. 5

Test No. 6

Test No. 7

Test No. 8

Test No. 9

Test No. 10

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Glenvar High School Stadium **Date of Test: 6/4/18** **Report No.: 18-020A-1**








Athletic Field Consultants, Inc. · P. O. Box 323, Queenstown, MD 21658 · athleticfieldconsultantsinc@gmail.com
Jeff Clise (301) 908-3526

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G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Glenvar High School Stadium **Date of Test: 6/4/18** **Report No.: 18-020A-1**








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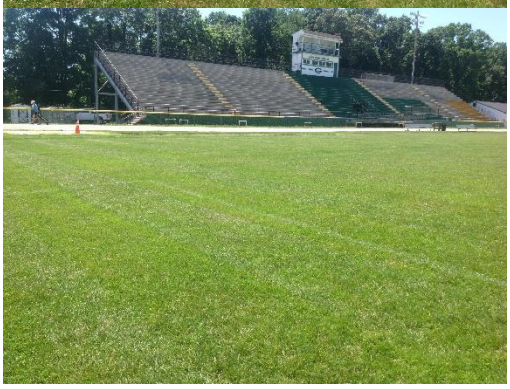
Location Photographs

Project Name: Glenvar High School Stadium **Date of Test: 6/4/18** **Report No.: 18-020A-1**







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G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Glenvar High School Stadium **Date of Test: 6/4/18** **Report No.: 18-020A-1**

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G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Glenvar High School Stadium **Date of Test: 6/4/18** **Report No.: 18-020A-1**

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Test Performed By: Jeff Clise
on behalf of Athletic Field Consultants, Inc.

Report No.: 18-020C-1

General Project Information

Date of Test: 6/4/2018 (warm, sunny, breezy)

Project Name: Glenvar High School Practice Field
Project Address: 4549 Malus Drive, Salem, VA 24153
Contact Name: Justin Cornwell, Draper Aden Associates
Contact Phone: o 804-261-1843 c 804-869-8110
Contact Email: JCornwell@daa.com

Field Conditions and Description of Field on Date of Test

Field Play Configuration: Soccer

Field Orientation: E, W (End to End)
Field Surface Type: Natural Grass Manufacturer: N/A Installation Date: N/A
Field Planarity: Noted in Observations/Recommendations

Test Point	Probe Depth (inches)	Temperature (F.) Air	Field	Drop No. 1	Drop No. 2	Drop No. 3	Average Drop (2 and 3)
1	2 ½	85	87	113	118	119	119
2	2	85	99	143	142	131	137
3	3 ½	85	95	110	116	117	117
4	2 ½	85	92	91	106	108	107
5	2	85	84	107	129	134	132
6	2	85	85	117	139	145	142
7	2 ¼	85	79	91	108	110	109
8	2	85	95	133	142	140	141
9	4	85	85	92	113	120	117
10	4 ½	85	84	82	99	105	102
Average GMAX Value for Entire Field							122
Values in Bold/Red Exceed the ASTM Maximum Allowed G-MAX of 200							
ASTM Specified Drop Height: 2' Producing an Impact Velocity 11.35 FPS ± 0.56							
Test Method: ASTM F 355, Test Method for Shock-Absorbing Properties of Playing Surface Systems and Materials. ASTM F1936-10, Standard Specification for Impact Attenuation of Turf Playing Systems as measured in the Field (G-MAX)							
Test equipment calibrated March 2017.							

Report Summary

Introduction:
An independent analysis of the natural grass playing surface, relative to gmax and general field conditions, was requested by the client. G-MAX Testing and Field Inspections were performed on the Glenvar High School Practice Field on June 4, 2018.
Ten separate locations were tested for G-MAX values. Each test location had three G-MAX tests performed in order to obtain the average G-MAX. The tests were performed using ASTM certified and calibrated equipment, and were performed at locations on the field as determined by the ASTM F 1936-10 Specifications. The test results reported herein reflect the performance of the points tested at the time of testing and at the temperatures reported.

Findings/Recommendations:
No site abnormalities were found and there were no deviations from standard test procedures. All test points met the requirement of less than 200 average G-MAX when tested except for those indicated by Bold Red and shown in the Test Result G-Max Table.

Athletic Field Consultants, Inc.

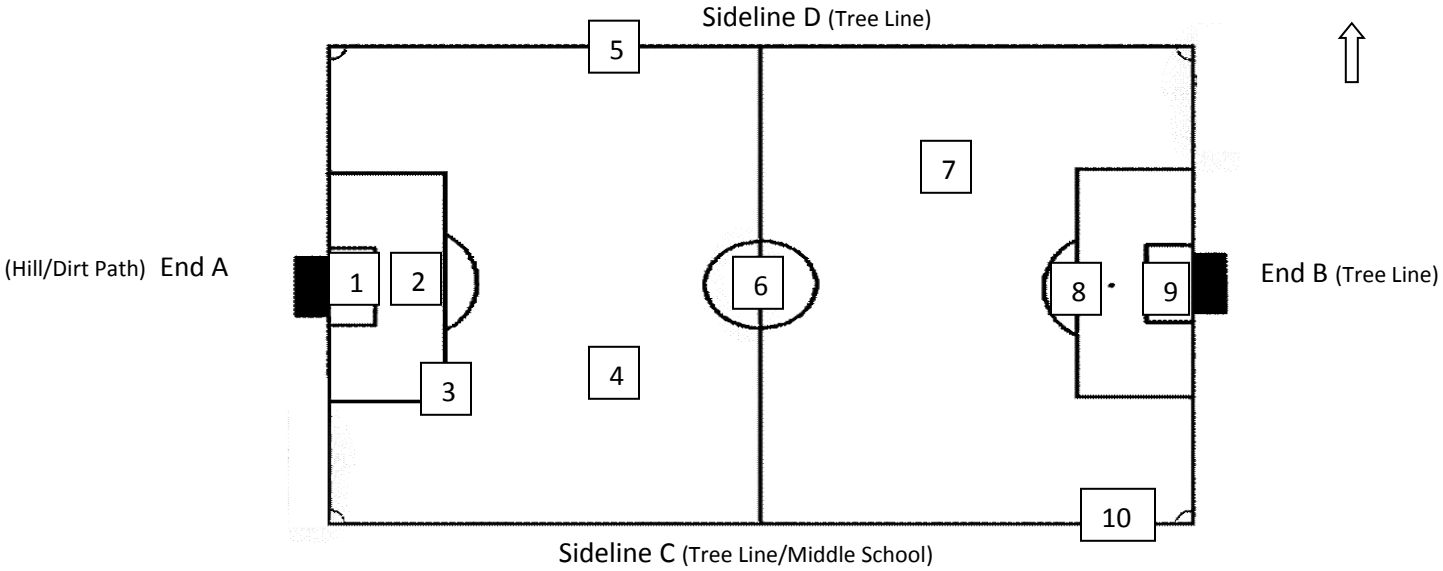
G-MAX Test and Field Inspection Report

Project Name: Glenvar High School Practice Field

Report No.: 18-020C-1

Date of Test: 6/4/2018

Test Point Location Diagram (Soccer Field)



Test No.	Test Point Location Description
1	3 ft. from Goal Line to Half-Way Line, End A, Center of Field
2	Penalty Kick Line, End A, Center of Field
3	63 ft. from Center of Field to Corner of Penalty Box, Touch Line C, End A
4	75 ft. from Half-Way Line to End A, 40 ft from Center of Field to Touch Line C
5	75 ft. from Half-Way Line to End A at Sideline D
6	Half-Way Line, Center of Field
7	75 ft. from Half-Way Line to End B, 63 ft from Center of Field to Touch Line D
8	½ the distance from Penalty Restraining Arc to leading edge of Penalty Box at End B, Center of Field
9	15 ft. from Goal Line to Half-Way Line, End B, Center of Field
10	30 ft. from Goal Line to Half-Way Line, End B at Touch Line C

*All test point locations are in accordance with ASTM specifications, but performed in sequence determined by tester.

Contact Discussions

Field Use: Soccer
Frequency of Use: Unknown
Maintenance Schedule: Unknown
Maintenance Equipment: Unknown

Turf Condition (Standing, Starting to Lay Over, Laying Over, Excess Fiber Wear, Inlays)

Goal Area: N/A
Creases/Penalty Kick: N/A
Center Field: N/A
Logo/Colored Areas: N/A
Sidelines: N/A
Inlays: N/A
Access Points to Field: N/A

General

Field Accessibility: Multiple
Field Security: None
Sporting Event Accessories and Maintenance Equipment Storage: Off Field

Observations/Recommendations: The grass cover on this field is clumpy with large areas where the grass is sparse or baron in the high wear areas (front of goals, penalty kicks, center of field) as well as other areas of the field. This can be seen in the overhead photos on page 11 of this report. The field was not mowed at the time of testing, which made it difficult to evaluate. At the time of testing, the soil was relatively moist due to many previous days of rain. The depth gauge probe was able to penetrate into the soil from 2 to 4 ½ inches, as reflected in the chart on page 1 of this report. Although the field meets the ASTM standard relative to GMAX at this time, it is important to remember that the soil composition and amount of moisture in a natural grass field have a direct impact on these results. It should also be noted that there are numerous subtle planarity changes across the field. It is evident from the surface of the soil that rain water ponds in the low areas. Additionally, the irregular transition from the fully grass covered areas to the sparse and baron areas affect the footing of the athlete and the potential for injuries to the lower body extremities.

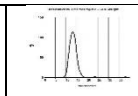
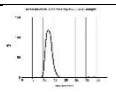
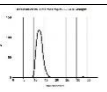
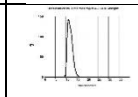
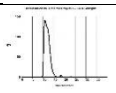
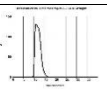
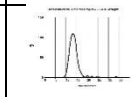
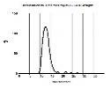
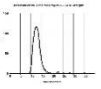
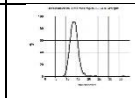
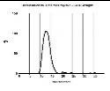
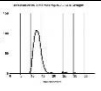
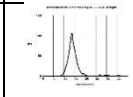
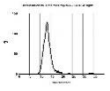
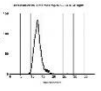
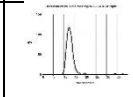
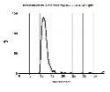
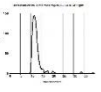
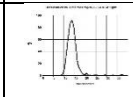
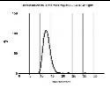
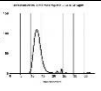
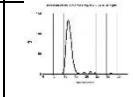
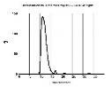
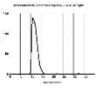
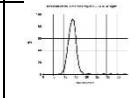
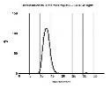
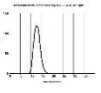
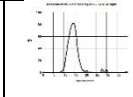
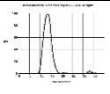
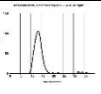
Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Impact Test Data
(Acceleration Time Curve)

Project Name: Glenvar HS Practice Field
Report No.: 18-020C-1

Date of Test: 6/4/2018
Test Performed By: Jeff Clise

Test Point No. 1 Drop Point No. 1		Test Point No.1 Drop Point No. 2		Test Point No.1 Drop Point No. 3	
Test Point No. 2 Drop Point No. 1		Test Point No. 2 Drop Point No. 2		Test Point No. 2 Drop Point No. 3	
Test Point No. 3 Drop Point No. 1		Test Point No. 3 Drop Point No. 2		Test Point No. 3 Drop Point No. 3	
Test Point No. 4 Drop Point No. 1		Test Point No. 4 Drop Point No. 2		Test Point No. 4 Drop Point No. 3	
Test Point No. 5 Drop Point No. 1		Test Point No. 5 Drop Point No. 2		Test Point No. 5 Drop Point No. 3	
Test Point No. 6 Drop Point No. 1		Test Point No. 6 Drop Point No. 2		Test Point No. 6 Drop Point No. 3	
Test Point No. 7 Drop Point No. 1		Test Point No. 7 Drop Point No. 2		Test Point No. 7 Drop Point No. 3	
Test Point No. 8 Drop Point No. 1		Test Point No. 8 Drop Point No. 2		Test Point No. 8 Drop Point No. 3	
Test Point No. 9 Drop Point No. 1		Test Point No. 9 Drop Point No. 2		Test Point No. 9 Drop Point No. 3	
Test Point No. 10 Drop Point No. 1		Test Point No. 10 Drop Point No. 2		Test Point No. 10 Drop Point No. 3	

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Test Point Location Photographs

Project Name: Glenvar High School Practice Field

Date of Test: 6/4/2018

Report No.: 18-020C-1

Test No. 1

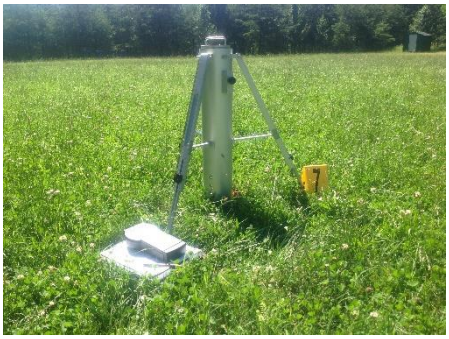
Test No. 2

Test No. No. 3

Test No. 4

Test No. 5

Test No. 6



Test No. 7

Test No. 8

Test No. 9

Test No. 10

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Glenvar HS Practice Field **Date of Test: 6/4/18** **Report No.: 18-020C-1**








Athletic Field Consultants, Inc. · P. O. Box 323, Queenstown, MD 21658 · athleticfieldconsultantsinc@gmail.com
Jeff Clise (301) 908-3526

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

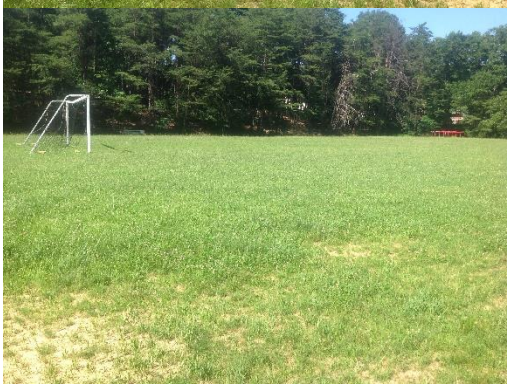
Location Photographs

Project Name: Glenvar HS Practice Field **Date of Test: 6/4/18** **Report No.: 18-020C-1**










Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Glenvar HS Practice Field **Date of Test: 6/4/18** **Report No.: 18-020C-1**








Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

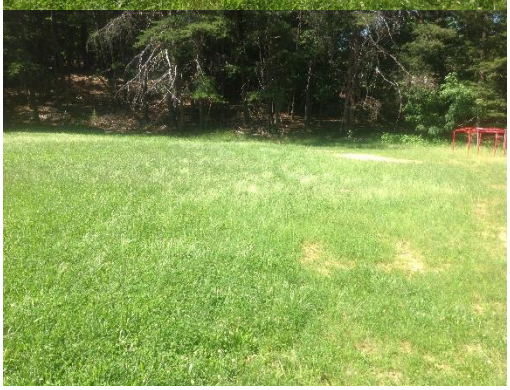
Location Photographs

Project Name: Glenvar HS Practice Field **Date of Test: 6/4/18** **Report No.: 18-020C-1**










Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Glenvar HS Practice Field **Date of Test: 6/4/18** **Report No.: 18-020C-1**








Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Glenvar HS Practice Field **Date of Test: 6/4/18** **Report No.: 18-020C-1**

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Test Performed By: Jeff Clise
on behalf of Athletic Field Consultants, Inc.

Report No.: 18-020B-1

General Project Information

Date of Test: 6/4/2018 (warm, sunny, breezy)

Project Name: Glenvar High School Soccer Field
Project Address: 4549 Malus Drive, Salem, VA 24153
Contact Name: Justin Cornwell, Draper Aden Associates
Contact Phone: o 804-261-1843 c 804-869-8110
Contact Email: JCornwell@daa.com

Field Conditions and Description of Field on Date of Test

Field Play Configuration: Soccer

Field Orientation: NE, SW (End to End)
Field Surface Type: Natural Grass Manufacturer: N/A Installation Date: N/A
Field Planarity: Noted in Observations/Recommendations

Test Point	Prope Depth (inches)	Temperature (F.) Air	Field	Drop No. 1	Drop No. 2	Drop No. 3	Average Drop (2 and 3)
1	1 ¾	85	92	111	119	118	119
2	6	85	83	75	84	87	86
3	6	85	98	62	77	81	79
4	3 ¾	85	97	72	82	86	84
5	2 ¼	85	94	88	112	121	117
6	6	85	92	76	85	86	86
7	6	85	87	59	69	72	71
8	6	85	90	68	78	80	79
9	4	85	83	68	75	75	75
10	1	85	93	88	115	129	122
Average GMAX Value for Entire Field							92
Values in Bold/Red Exceed the ASTM Maximum Allowed G-MAX of 200							
ASTM Specified Drop Height: 2' Producing an Impact Velocity 11.35 FPS ± 0.56							
Test Method: ASTM F 355, Test Method for Shock-Absorbing Properties of Playing Surface Systems and Materials. ASTM F1936-10, Standard Specification for Impact Attenuation of Turf Playing Systems as measured in the Field (G-MAX)							
Test equipment calibrated March 2017.							

Report Summary

Introduction:
An independent analysis of the natural grass playing surface, relative to gmax and general field conditions, was requested by the client. G-MAX Testing and Field Inspections were performed on the Glenvar High School Soccer Field on June 4, 2018.
Ten separate locations were tested for G-MAX values. Each test location had three G-MAX tests performed in order to obtain the average G-MAX. The tests were performed using ASTM certified and calibrated equipment, and were performed at locations on the field as determined by the ASTM F 1936-10 Specifications. The test results reported herein reflect the performance of the points tested at the time of testing and at the temperatures reported.

Findings/Recommendations:
No site abnormalities were found and there were no deviations from standard test procedures. All test points met the requirement of less than 200 average G-MAX when tested except for those indicated by Bold Red and shown in the Test Result G-Max Table.

Athletic Field Consultants, Inc.

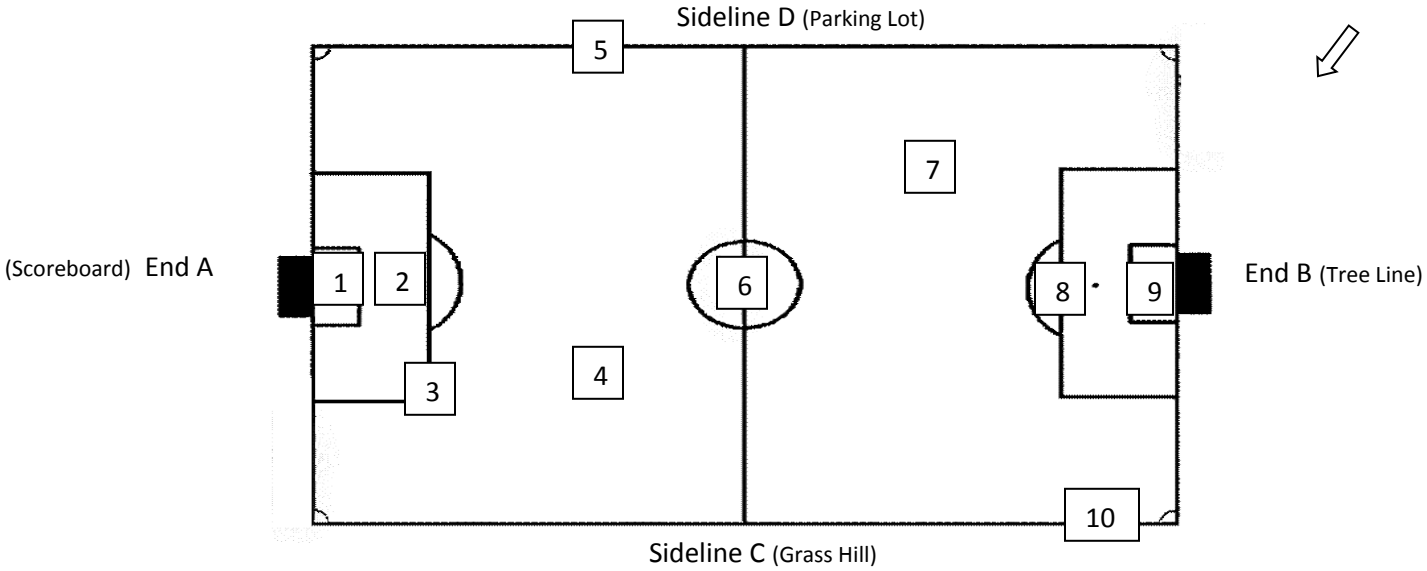
G-MAX Test and Field Inspection Report

Project Name: Glenvar High School Soccer Field

Report No.: 18-020B-1

Date of Test: 6/4/2018

Test Point Location Diagram (Soccer Field)



Test No.	Test Point Location Description
1	3 ft. from Goal Line to Half-Way Line, End A, Center of Field
2	Penalty Kick Line, End A, Center of Field
3	63 ft. from Center of Field to Corner of Penalty Box, Touch Line C, End A
4	75 ft. from Half-Way Line to End A, 40 ft from Center of Field to Touch Line C
5	75 ft. from Half-Way Line to End A at Sideline D
6	Half-Way Line, Center of Field
7	75 ft. from Half-Way Line to End B, 63 ft from Center of Field to Touch Line D
8	½ the distance from Penalty Restraining Arc to leading edge of Penalty Box at End B, Center of Field
9	15 ft. from Goal Line to Half-Way Line, End B, Center of Field
10	30 ft. from Goal Line to Half-Way Line, End B at Touch Line C

*All test point locations are in accordance with ASTM specifications, but performed in sequence determined by tester.

Contact Discussions

Field Use: Soccer
Frequency of Use: Unknown
Maintenance Schedule: Unknown
Maintenance Equipment: Unknown

Turf Condition (Standing, Starting to Lay Over, Laying Over, Excess Fiber Wear, Inlays)

Goal Area: N/A
Creases/Penalty Kick: N/A
Center Field: N/A
Logo/Colored Areas: N/A
Sidelines: N/A
Inlays: N/A
Access Points to Field: N/A

General

Field Accessibility: Multiple
Field Security: Fence
Sporting Event Accessories and Maintenance Equipment Storage: Off Field

Observations/Recommendations: While the field appears to be grass covered in general, the surface is very clumpy. There are also areas where the grass is sparse or baron in the high wear areas (front of goals, penalty kicks, center of field) as well as other areas of the field, including the sidelines. This can be seen in the overhead photos on pages 11 and 12 of this report. At the time of testing, the soil was relatively moist due to many previous days of rain. The depth gauge probe was able to penetrate into the soil from 1 to 6 inches in various locations, as reflected in the chart on page one of this report. Although the field meets the ASTM standard relative to GMAX at this time, it is important to remember that the soil composition and amount of moisture in a natural grass field have a direct impact on these results. It should also be noted that there are numerous subtle planarity changes across the field. It is evident from the surface of the soil that rain water ponds in the low areas. Additionally, the irregular transition from the fully grass covered areas to the sparse and baron areas affect the footing of the athlete and the potential for injuries to the lower body extremities.

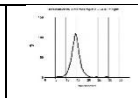
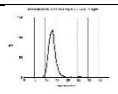
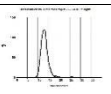
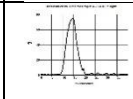
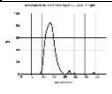
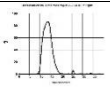
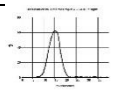
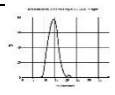
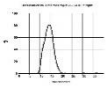
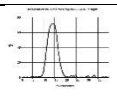
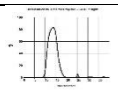
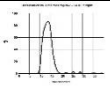
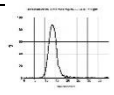
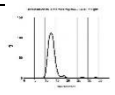
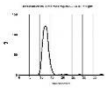
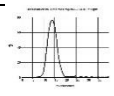
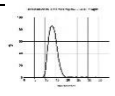
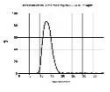
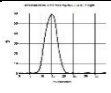
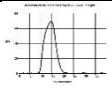
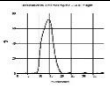
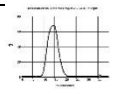
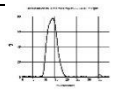
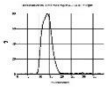
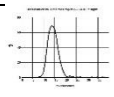
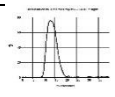
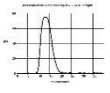
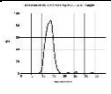
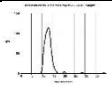
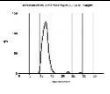
Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Impact Test Data
(Acceleration Time Curve)

Project Name: Glenvar HS Soccer Field
Report No.: 18-020B-1

Date of Test: 6/4/2018
Test Performed By: Jeff Clise

Test Point No. 1 Drop Point No. 1		Test Point No.1 Drop Point No. 2		Test Point No.1 Drop Point No. 3	
Test Point No. 2 Drop Point No. 1		Test Point No. 2 Drop Point No. 2		Test Point No. 2 Drop Point No. 3	
Test Point No. 3 Drop Point No. 1		Test Point No. 3 Drop Point No. 2		Test Point No. 3 Drop Point No. 3	
Test Point No. 4 Drop Point No. 1		Test Point No. 4 Drop Point No. 2		Test Point No. 4 Drop Point No. 3	
Test Point No. 5 Drop Point No. 1		Test Point No. 5 Drop Point No. 2		Test Point No. 5 Drop Point No. 3	
Test Point No. 6 Drop Point No. 1		Test Point No. 6 Drop Point No. 2		Test Point No. 6 Drop Point No. 3	
Test Point No. 7 Drop Point No. 1		Test Point No. 7 Drop Point No. 2		Test Point No. 7 Drop Point No. 3	
Test Point No. 8 Drop Point No. 1		Test Point No. 8 Drop Point No. 2		Test Point No. 8 Drop Point No. 3	
Test Point No. 9 Drop Point No. 1		Test Point No. 9 Drop Point No. 2		Test Point No. 9 Drop Point No. 3	
Test Point No. 10 Drop Point No. 1		Test Point No. 10 Drop Point No. 2		Test Point No. 10 Drop Point No. 3	

Athletic Field Consultants, Inc.

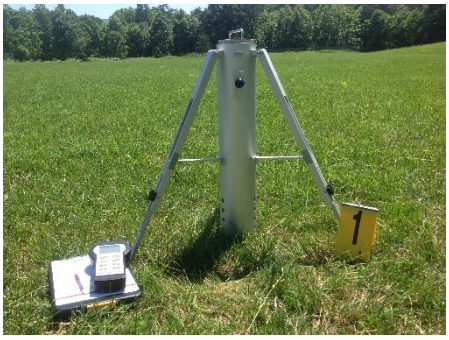
G-MAX Test and Field Inspection Report

Test Point Location Photographs

Project Name: Glenvar High School Soccer Field

Date of Test: 6/4/2018

Report No.: 18-020B-1



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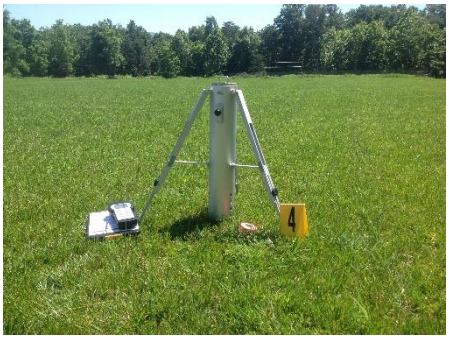

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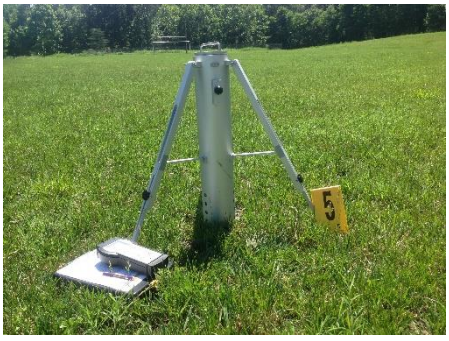

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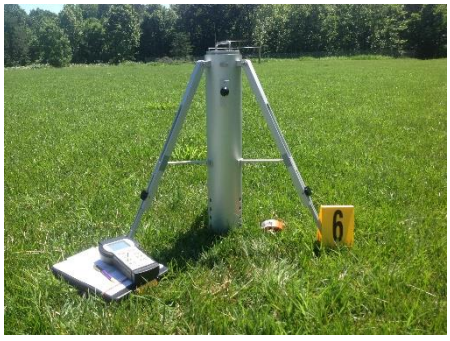

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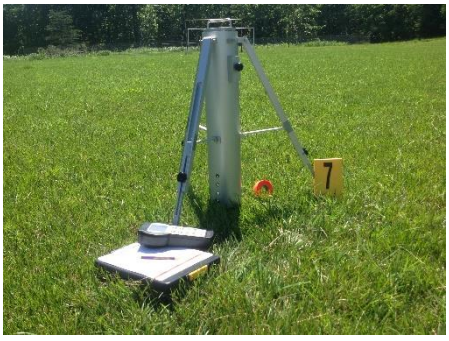

Test No. 7

Test No. 8

Test No. 9

Test No. 10

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Glenvar HS Soccer Field **Date of Test: 6/4/18** **Report No.: 18-020B-1**








Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Glenvar HS Soccer Field **Date of Test: 6/4/18** **Report No.: 18-020B-1**








Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Glenvar HS Soccer Field **Date of Test: 6/4/18** **Report No.: 18-020B-1**

Athletic Field Consultants, Inc. · P. O. Box 323, Queenstown, MD 21658 · athleticfieldconsultantsinc@gmail.com
Jeff Clise (301) 908-3526

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Glenvar HS Soccer Field **Date of Test: 6/4/18** **Report No.: 18-020B-1**

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Location Photographs

Project Name: Glenvar HS Soccer Field **Date of Test: 6/4/18** **Report No.: 18-020B-1**

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Test Performed By: Jeff Clise
on behalf of Athletic Field Consultants, Inc.

Report No.: 18-022A-1

General Project Information

Date of Test: 6/5/2018 (warm, partly sunny)

Project Name: Hidden Valley High School Practice Field
Project Address: 5000 Titan Trail, Roanoke, VA 24018
Contact Name: Justin Cornwell, Draper Aden Associates
Contact Phone: o 804-261-1843 c 804-869-8110
Contact Email: JCornwell@daa.com

Field Conditions and Description of Field on Date of Test

Field Play Configuration: Football

Field Orientation: NW, SE (End to End)
Field Surface Type: Natural Grass Manufacturer: N/A Installation Date: N/A
Field Planarity: Noted in Observations/Recommendations

Test Point	Probe Depth (inches)	Temperature (F.) Air	Field	Drop No. 1	Drop No. 2	Drop No. 3	Average Drop (2 and 3)
1	2	66	74	84	88	88	88
2	6	66	71	81	84	82	83
3	6	66	73	97	113	116	115
4	3	66	69	96	109	113	111
5	1	66	68	115	122	121	122
6	4	66	74	112	126	130	128
7	2 ½	66	68	101	112	115	114
8	2 ½	66	70	94	105	109	107
9	1	66	66	122	145	146	146
10	2 ¼	66	69	87	101	104	103
Average GMAX Value for Entire Field							112
Values in Bold/Red Exceed the ASTM Maximum Allowed G-MAX of 200							
ASTM Specified Drop Height: 2' Producing an Impact Velocity 11.35 FPS ± 0.56							
Test Method: ASTM F 355, Test Method for Shock-Absorbing Properties of Playing Surface Systems and Materials. ASTM F1936-10, Standard Specification for Impact Attenuation of Turf Playing Systems as measured in the Field (G-MAX)							
Test equipment calibrated March 2017.							

Report Summary

Introduction:
An independent analysis of the natural grass playing surface, relative to gmax and general field conditions, was requested by the client. G-MAX Testing and Field Inspections were performed on the Hidden Valley High School Practice Field on June 5, 2018.
Ten separate locations were tested for G-MAX values. Each test location had three G-MAX tests performed in order to obtain the average G-MAX. The tests were performed using ASTM certified and calibrated equipment, and were performed at locations on the field as determined by the ASTM F 1936-10 Specifications. The test results reported herein reflect the performance of the points tested at the time of testing and at the temperatures reported.

Findings/Recommendations:
No site abnormalities were found and there were no deviations from standard test procedures. All test points met the requirement of less than 200 average G-MAX when tested except for those indicated by Bold Red and shown in the Test Result G-Max Table.

Athletic Field Consultants, Inc.

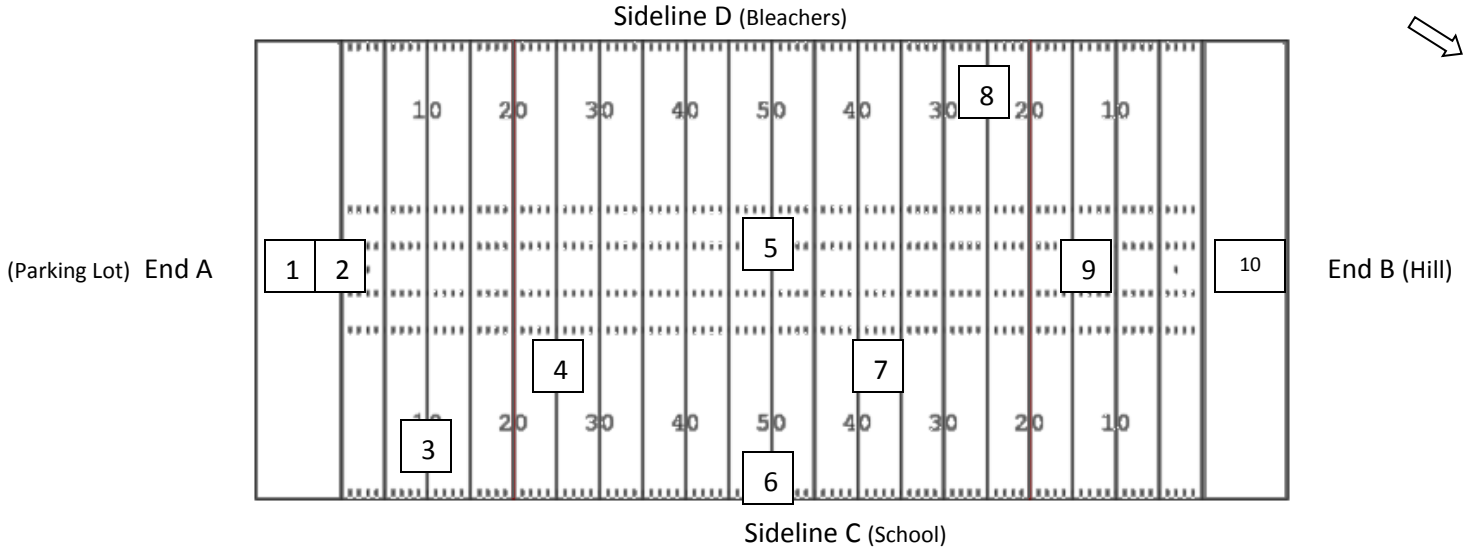
G-MAX Test and Field Inspection Report

Project Name: Hidden Valley High School Practice Field

Report No.: 18-022A-1

Date of Test: 6/5/2018

Test Point Location Diagram (Football Field)



Test No.	Test Point Location Description
1	End Zone A 6'From Goal Line Along Center Line of Field
2	End Zone A Goal Line at Center of Field
3	End A 10 Yard Line at Numbers Along Sideline C
4	End A 25 Yard Line at the Hash Marks Along Sideline C
5	50 Yard Line at Center of Field
6	50 Yard Line at Side Line C
7	End B 35 Yard Line at the Hash Marks Along Sideline C
8	End B 25 Yard Line at the Numbers Along Sideline D
9	End B 12 Yard Line Center of Field
10	End Zone B 6' From Back of End Zone Along Center Line of Field

*All test point locations are in accordance with ASTM specifications, but performed in sequence determined by tester.

Contact Discussions

Field Use: Football
Frequency of Use: Unknown
Maintenance Schedule: Unknown
Maintenance Equipment: Unknown

Turf Condition (Standing, Starting to Lay Over, Laying Over, Excess Fiber Wear, Inlays)

Goal Area: N/A
Creases/Penalty Kick: N/A
Center Field: N/A
Logo/Colored Areas: N/A
Sidelines: N/A
Inlays: N/A
Access Points to Field: N/A

General

Field Accessibility: Multiple
Field Security: Fence
Sporting Event Accessories and Maintenance Equipment Storage: Off Field

Observations/Recommendations: While the field appears to be grass covered in general, there are many places where the grass is sparse or baron in the high wear areas (front of goals, penalty kicks, center of field), as well as other areas of the field, including the sidelines where the players stand. Additionally, the yard lines also appear to be sparse/bare, possibly from the paint product used to mark the lines. This can be easily seen in the overhead photos on page 11 of this report. At the time of testing, the soil was relatively moist due to many previous days of rain and the grass was damp from the morning dew. The depth gauge probe was able to penetrate into the soil from 1 to 6 inches in various locations, as reflected in the chart on page 1 of this report. Although the field meets the ASTM standard relative to GMAX at this time, it is important to remember that the soil composition and amount of moisture in a natural grass field have a direct impact on these results. It should also be noted that there are numerous subtle planarity changes across the field. It is evident from the surface of the soil that water ponds in the low areas. Additionally, the irregular transition from the fully grass covered areas to the sparse and baron areas affect the footing of the athlete and the potential for injuries to the lower body extremities.

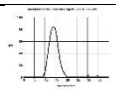
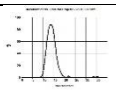
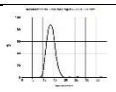
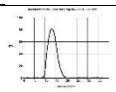
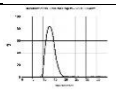
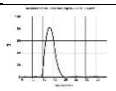
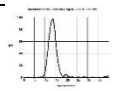
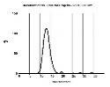
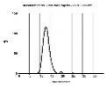
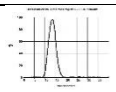
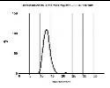
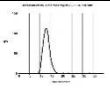
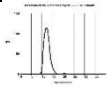
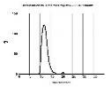
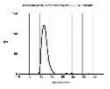
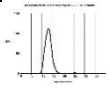
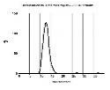
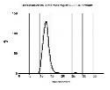
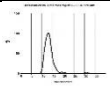
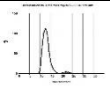
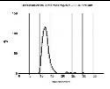
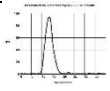
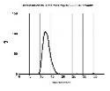
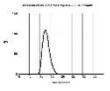
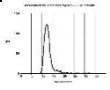
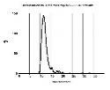
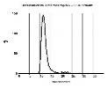
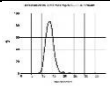
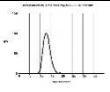
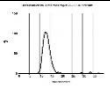
Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Impact Test Data
(Acceleration Time Curve)

Project Name: Hidden Valley HS Practice
Report No.: 18-022A-1

Date of Test: 6/5/18
Test Performed By: Jeff Clise

Test Point No. 1 Drop Point No. 1		Test Point No.1 Drop Point No. 2		Test Point No.1 Drop Point No. 3	
Test Point No. 2 Drop Point No. 1		Test Point No. 2 Drop Point No. 2		Test Point No. 2 Drop Point No. 3	
Test Point No. 3 Drop Point No. 1		Test Point No. 3 Drop Point No. 2		Test Point No. 3 Drop Point No. 3	
Test Point No. 4 Drop Point No. 1		Test Point No. 4 Drop Point No. 2		Test Point No. 4 Drop Point No. 3	
Test Point No. 5 Drop Point No. 1		Test Point No. 5 Drop Point No. 2		Test Point No. 5 Drop Point No. 3	
Test Point No. 6 Drop Point No. 1		Test Point No. 6 Drop Point No. 2		Test Point No. 6 Drop Point No. 3	
Test Point No. 7 Drop Point No. 1		Test Point No. 7 Drop Point No. 2		Test Point No. 7 Drop Point No. 3	
Test Point No. 8 Drop Point No. 1		Test Point No. 8 Drop Point No. 2		Test Point No. 8 Drop Point No. 3	
Test Point No. 9 Drop Point No. 1		Test Point No. 9 Drop Point No. 2		Test Point No. 9 Drop Point No. 3	
Test Point No. 10 Drop Point No. 1		Test Point No. 10 Drop Point No. 2		Test Point No. 10 Drop Point No. 3	

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Test Point Location Photographs

Project Name: Hidden Valley High School Practice Field

Date of Test: 6/5/2018

Report No.: 18-022A-1

Test No. 1

Test No. 2

Test No. 3

Test No. 4

Test No. 5

Test No. 6

Test No. 7

Test No. 8

Test No. 9

Test No. 10

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

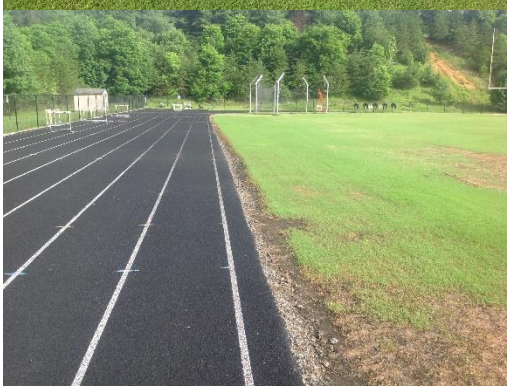
Location Photographs

Project Name: Hidden Valley HS Practice Field **Date of Test: 6/5/18** **Report No.: 18-022A-1**







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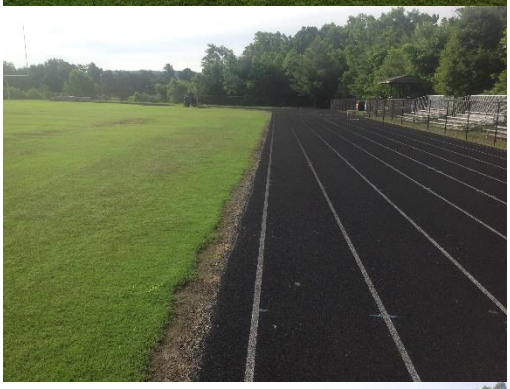
G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Hidden Valley HS Practice Field **Date of Test: 6/5/18** **Report No.: 18-022A-1**






Athletic Field Consultants, Inc. · P. O. Box 323, Queenstown, MD 21658 · athleticfieldconsultantsinc@gmail.com
Jeff Clise (301) 908-3526

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Hidden Valley HS Practice Field **Date of Test: 6/5/18** **Report No.: 18-022A-1**

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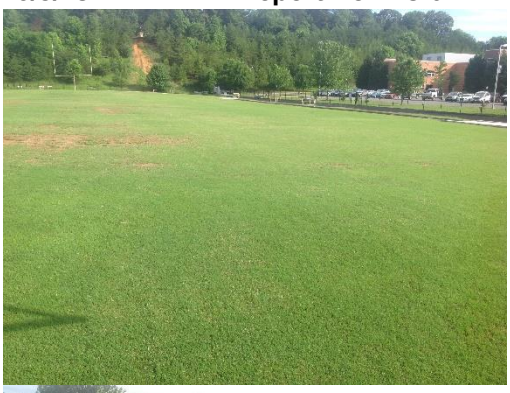
G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Hidden Valley HS Practice Field **Date of Test: 6/5/18** **Report No.: 18-022A-1**





Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Hidden Valley HS Practice Field **Date of Test: 6/5/18** **Report No.: 18-022A-1**

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G-MAX Test and Field Inspection Report

Location Photographs

Project Name: Hidden Valley HS Practice Field **Date of Test: 6/5/18** **Report No.: 18-022A-1**







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G-MAX Test and Field Inspection Report

Test Performed By: Jeff Clise
on behalf of Athletic Field Consultants, Inc.

Report No.: 18-022B-1

Date of Test: 6/5/2018 (warm, partly sunny, light breeze)

General Project Information

Project Name: Hidden Valley High School Soccer Field
Project Address: 5000 Titan Trail, Roanoke, VA 24018
Contact Name: Justin Cornwell, Draper Aden Associates
Contact Phone: o 804-261-1843 c 804-869-8110
Contact Email: JCornwell@daa.com

Field Conditions and Description of Field on Date of Test

Field Play Configuration: Soccer

Field Orientation: NE, SW (End to End)
Field Surface Type: Natural Grass Manufacturer: N/A Installation Date: N/A
Field Planarity: Noted in Observations/Recommendations

Test Point	Probe Depth (inches)	Temperature (F.) Air	Field	Drop No. 1	Drop No. 2	Drop No. 3	Average Drop (2 and 3)
1	1	68	70	103	116	110	113
2	1 ½	68	74	115	128	129	129
3	6	68	70	96	111	114	113
4	2	68	71	103	118	124	121
5	3	68	66	94	104	105	105
6	2	68	72	95	103	106	105
7	2 ½	68	72	111	129	134	132
8	2	68	73	116	138	145	142
9	1	68	74	119	132	138	135
10	2 ½	68	76	104	118	123	121
Average GMAX Value for Entire Field							122
Values in Bold/Red Exceed the ASTM Maximum Allowed G-MAX of 200							
ASTM Specified Drop Height: 2' Producing an Impact Velocity 11.35 FPS ± 0.56							
Test Method: ASTM F 355, Test Method for Shock-Absorbing Properties of Playing Surface Systems and Materials. ASTM F1936-10, Standard Specification for Impact Attenuation of Turf Playing Systems as measured in the Field (G-MAX)							
Test equipment calibrated March 2017.							

Report Summary

Introduction:

An independent analysis of the natural grass playing surface, relative to gmax and general field conditions, was requested by the client. G-MAX Testing and Field Inspections were performed on the Hidden Valley High School Soccer Field on June 5, 2018.
Ten separate locations were tested for G-MAX values. Each test location had three G-MAX tests performed in order to obtain the average G-MAX. The tests were performed using ASTM certified and calibrated equipment, and were performed at locations on the field as determined by the ASTM F 1936-10 Specifications. The test results reported herein reflect the performance of the points tested at the time of testing and at the temperatures reported.

Findings/Recommendations:

No site abnormalities were found and there were no deviations from standard test procedures. All test points met the requirement of less than 200 average G-MAX when tested except for those indicated by Bold Red and shown in the Test Result G-Max Table.

Athletic Field Consultants, Inc.

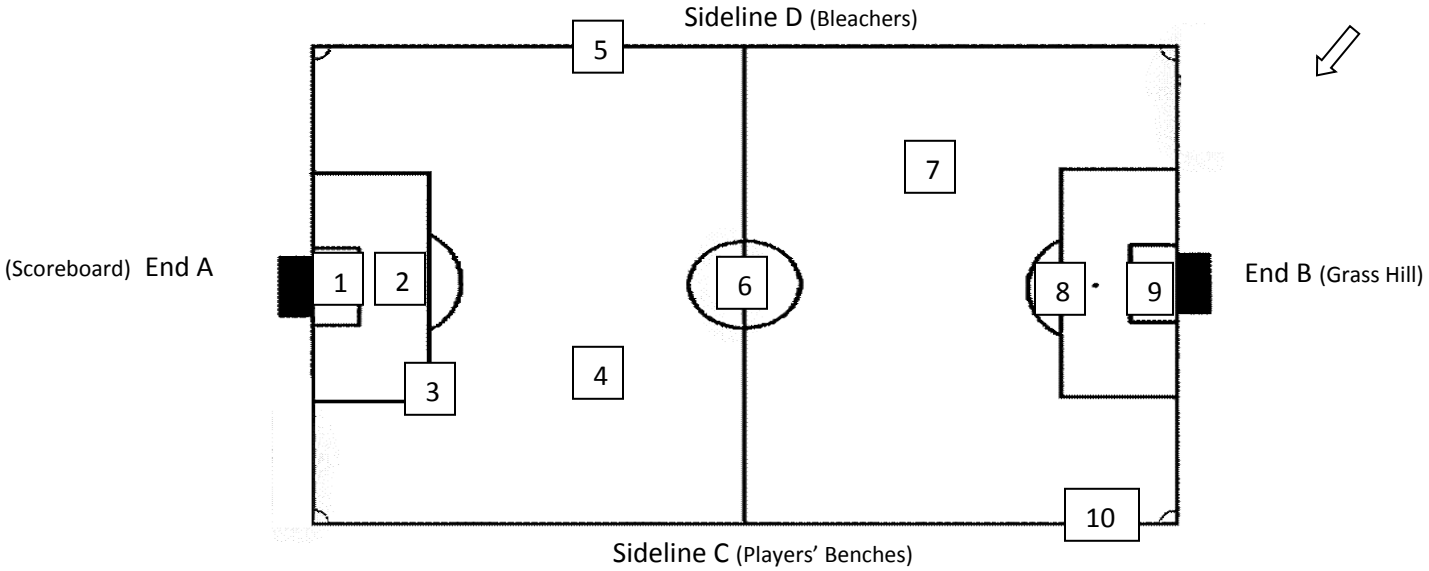
G-MAX Test and Field Inspection Report

Project Name: Hidden Valley High School Soccer Field

Report No.: 18-022B-1

Date of Test: 6/5/2018

Test Point Location Diagram (Soccer Field)



Test No.	Test Point Location Description
1	3 ft. from Goal Line to Half-Way Line, End A, Center of Field
2	Penalty Kick Line, End A, Center of Field
3	63 ft. from Center of Field to Corner of Penalty Box, Touch Line C, End A
4	75 ft. from Half-Way Line to End A, 40 ft from Center of Field to Touch Line C
5	75 ft. from Half-Way Line to End A at Sideline D
6	Half-Way Line, Center of Field
7	75 ft. from Half-Way Line to End B, 63 ft from Center of Field to Touch Line D
8	½ the distance from Penalty Restraining Arc to leading edge of Penalty Box at End B, Center of Field
9	15 ft. from Goal Line to Half-Way Line, End B, Center of Field
10	30 ft. from Goal Line to Half-Way Line, End B at Touch Line C

*All test point locations are in accordance with ASTM specifications, but performed in sequence determined by tester.

Contact Discussions

Field Use: Soccer
Frequency of Use: Unknown
Maintenance Schedule: Unknown
Maintenance Equipment: Unknown

Turf Condition (Standing, Starting to Lay Over, Laying Over, Excess Fiber Wear, Inlays)

Goal Area: N/A
Creases/Penalty Kick: N/A
Center Field: N/A
Logo/Colored Areas: N/A
Sidelines: N/A
Inlays: N/A
Access Points to Field: N/A

General

Field Accessibility: Multiple
Field Security: Fence
Sporting Event Accessories and Maintenance Equipment Storage: Off Field

Observations/Recommendations: While the field appears to be grass covered in general, there are some areas where the grass is sparse or baron in the high wear areas (front of goals, penalty kicks, center of field), as well as other areas of the field. This can be seen in the overhead photos on page 11 of this report. At the time of testing, the soil was relatively moist due to many previous days of rain and the grass was damp from the morning dew. The depth gauge probe was able to penetrate into the soil from 1 to 6 inches in various locations, as reflected in the chart on page 1 of this report. Although the field meets the ASTM standard relative to GMAX at this time, it is important to remember that the soil composition and amount of moisture in a natural grass field have a direct impact on these results. It should also be noted that there are numerous subtle planarity changes across the field. It is evident from the surface of the soil that water ponds in the low areas. Additionally, the irregular transition from the fully grass covered areas to the sparse and baron areas affect the footing of the athlete and the potential for injuries to the lower body extremities.

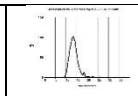
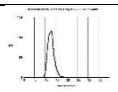
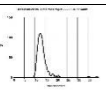
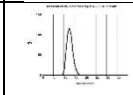
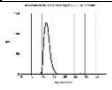
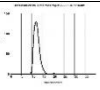
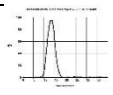
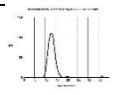
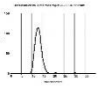
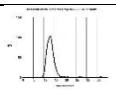
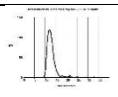
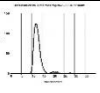
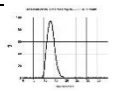
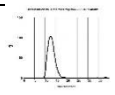
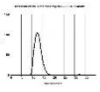
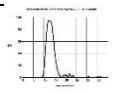
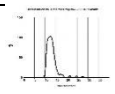
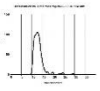
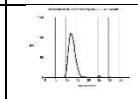
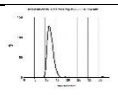
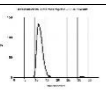
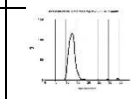
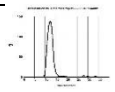
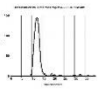
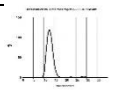
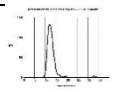
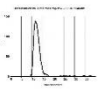
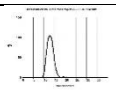
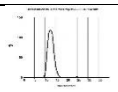
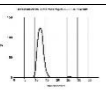
Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Impact Test Data
(Acceleration Time Curve)

Project Name: Hidden Valley HS Soccer
Report No.: 18-022B-1

Date of Test: 6/5/2018
Test Performed By: Jeff Clise

Test Point No. 1 Drop Point No. 1		Test Point No.1 Drop Point No. 2		Test Point No.1 Drop Point No. 3	
Test Point No. 2 Drop Point No. 1		Test Point No. 2 Drop Point No. 2		Test Point No. 2 Drop Point No. 3	
Test Point No. 3 Drop Point No. 1		Test Point No. 3 Drop Point No. 2		Test Point No. 3 Drop Point No. 3	
Test Point No. 4 Drop Point No. 1		Test Point No. 4 Drop Point No. 2		Test Point No. 4 Drop Point No. 3	
Test Point No. 5 Drop Point No. 1		Test Point No. 5 Drop Point No. 2		Test Point No. 5 Drop Point No. 3	
Test Point No. 6 Drop Point No. 1		Test Point No. 6 Drop Point No. 2		Test Point No. 6 Drop Point No. 3	
Test Point No. 7 Drop Point No. 1		Test Point No. 7 Drop Point No. 2		Test Point No. 7 Drop Point No. 3	
Test Point No. 8 Drop Point No. 1		Test Point No. 8 Drop Point No. 2		Test Point No. 8 Drop Point No. 3	
Test Point No. 9 Drop Point No. 1		Test Point No. 9 Drop Point No. 2		Test Point No. 9 Drop Point No. 3	
Test Point No. 10 Drop Point No. 1		Test Point No. 10 Drop Point No. 2		Test Point No. 10 Drop Point No. 3	

Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

Test Point Location Photographs

Project Name: Hidden Valley High School Soccer Field

Date of Test: 6/5/2018

Report No.: 18-022B-1

Test No. 1

Test No. 2

Test No. 3

Test No. 4

Test No. 5

Test No. 6

Test No. 7

Test No. 8

Test No. 9

Test No. 10

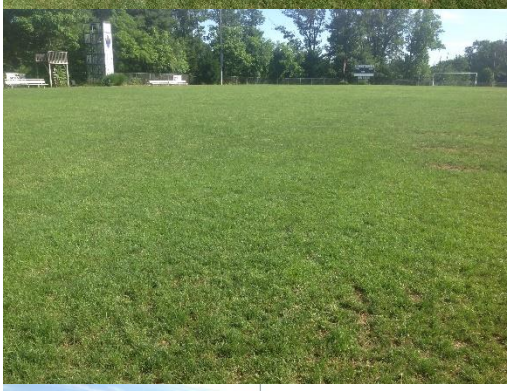
Athletic Field Consultants, Inc.

G-MAX Test and Field Inspection Report

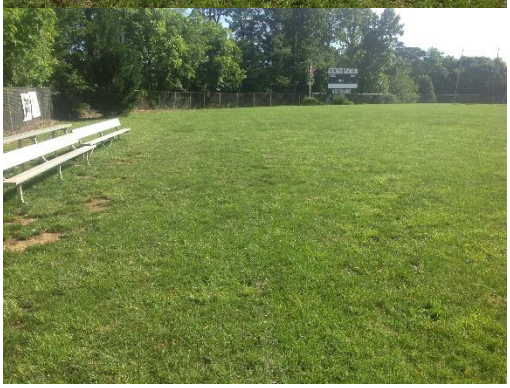
Location Photographs

Project Name: Hidden Valley HS Soccer Field **Date of Test: 6/5/18** **Report No.: 18-022B-1**







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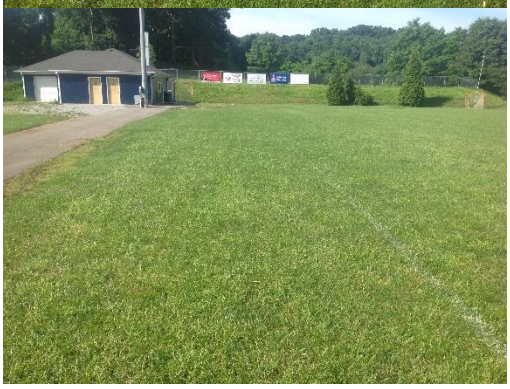


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