

RFP NO. 17-33 REQUEST FOR PROPOSAL (RFP) FOR THOMPSON STADIUM TRACK:

TRACK REPLACEMENT PROJECT

BIBB COUNTY SCHOOL DISTRICT
484 Mulberry Street Macon, Georgia 31210

Addendum No 1- (May 30, 2017):

Replace Page 8 with New Page 8 in RFP 17 – 33.

- New proposal form requesting additional alternate for Polyurethane Track Surface (1page)

Include as specifications for the project:

- Running Track Asphalt Paving : Attachment A (4 pages)
- 13 mm Latex Track System: Attachment B (4 pages)
- Track Equipment Specifications: Attachment C (2 pages)
- Synthetic Track Surfacing – Spurtan BS Specification – Alternate Track Surface (4 pages)

End of Addendum 1

3.3 Submission of Proposal

The packages shall be in sealed envelopes and identified as follows:

RFP Number:
 Opening Date and Time:
 Request for Proposal Name:
 Georgia General Contractor's License Number:

All packages are due at the location specified no later than the date and time specified herein. The PROPOSAL package must include detailed information relative to Section 2.2.4, Contractor Proposal, as required.

Proposals shall include the following pricing:

Base Bid – 13 mm Black Latex Track resurface:	\$ _____
Alternate 1 - 13mm Red Latex Track resurface:	\$ _____
Alternate 2 – Spurtan BS Polyurethane Track Surface	\$ _____
Remove & Replace High Jump Pad w/ Concrete:	\$ _____
Mill Asphalt & Overlay New Asphalt:	\$ _____
Replace Take-Off Boards (Price Per Each):	\$ _____

3.4 Evaluation Criteria and Process

3.4.1. Review of Proposal

All Proposals received will be reviewed by the Purchasing Manager to ensure all administrative requirements of the RFP package have been met by the Offeror (s). Each Proposal will be reviewed to ensure the Offeror (s) submitted all information required in the RFP and all documents requiring a signature have been signed. Failure to meet these requirements may be cause for rejection. All PROPOSALS meeting the administrative requirements will then be turned over to the Evaluation Committee for further evaluation.

3.4.2 Evaluation Committee

The Evaluation Committee will review all submittals received and rank Offeror (s) based on submittal information required in RFP Section 2.2.4, Contractor Proposal. Points will be awarded on the following basis (Proposal Cost: 60%; Company Experience & Personnel: 30%; Proposal Organization: 10%). Discussions may be conducted by the Board of Education with responsible Offeror (s) who submit PROPOSALS determined to be reasonably susceptible of being selected for award for the purpose of clarification to assure full understanding of and responsiveness to the solicitation requirements. Offeror (s) shall be accorded fair and equal treatment with respect to any opportunity for discussion and revision of Requests; and such revisions may be permitted after submissions and prior to award. In conducting any such discussions, there shall be no disclosure of any information derived from Proposals submitted by competing Offeror (s).

Attachment A

RUNNING TRACK ASPHALT PAVING

PART 1 GENERAL

1.01 SCOPE OF WORK

Furnish all labor, materials, tools and equipment necessary to prepare and place the asphalt wearing course on the running track. The track shall be milled to a minimum depth of one and one half inches prior to installation of the wearing course.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Synthetic Track Surface – Attachment B

1.03 QUALITY ASSURANCE

- A. Use materials furnished by bulk asphalt concrete producer regularly engaged in production of hot-mix, hot-laid asphalt concrete.
- B. Furnish material certificate signed by the asphalt producer and contractor, certifying that the materials comply with specified requirements.

1.04 CONTRACTOR QUALIFICATIONS

- A. The asphalt concrete paving contractor must have a minimum of five (5) years of experience in the installation of running track surfacing.
- B. The asphalt concrete paving contractor must have installed a minimum of ten outdoor tennis/running track facilities.

1.05 PAVING QUALITY REQUIREMENTS

- A. In addition to other specified conditions, comply with the following minimum:
 - 1. Test in-place asphalt concrete courses for compliance with requirements for density, thickness and surface smoothness.
 - 2. Provide final surfaces of uniform texture, conforming to required grades and cross-sections.
 - 3. Owner's Testing Laboratory may take 4 inch diameter pavement specimens for each completed course.
 - 4. Repair holes from test specimens.
- B. In-place Compacted Thickness:
 - 1. Crushed stone base: Minimum Compacted Depth (4") – Not Required
 - 2. Binder course: Type B Asphaltic Concrete, Minimum Compacted Depth (1 ½") – Not Required

3. Wearing course: Type F Asphaltic Concrete, Minimum Compacted Depth (1 ½")
- C. Surface Smoothness: 1/8" in 10 feet.
- D. In the presence of the surfacing subcontractor and the Certified Track Builder, flood the surface immediately after the asphalt is capable of handling traffic, but within twenty four (24) hours. If, after twenty (20) minutes of drying time, there are birdbaths evident, correct all deficiencies using a method satisfactory to the surfacing subcontractor and Architect. No cold tar patching, skin patching or sand mix patching will be acceptable.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Crushed Stone Base: Meet Georgia D.O.T. Specification 815.
- B. Tack Coat: emulsified asphalt or cationic emulsified asphalt, slow setting, factory diluted in water, of suitable grade and consistency for application.
- C. Prime Coat: Asphaltic emulsion prime conforming to state DOT requirements.
- D. Binder Course: Meet Georgia D.O.T. Specification for Type "B" hot-mix asphaltic concrete.
- E. Wearing Course: Meet Georgia D.O.T. Specification for Type "F" hot-mix asphaltic concrete.

PART 3 EXECUTION

3.01 SURFACE PREPARATION

- A. Crushed stone base:
 1. Check subgrade for line and grade before placing base.
 2. Place base material in compliance with GDOT Specifications.
- B. Loose and Foreign Material: Remove loose and foreign material from crushed stone base and verify slope and planarity before application of prime coat (If Required).
- B. Prime coat (IF Required):
 1. Comply with GDOT Specifications.
 2. Apply prime coat by brush to contact surfaces of structures projecting into or abutting asphalt concrete pavement.
 3. Allow surfaces to become tacky.

3.02 EQUIPMENT

- A. Provide equipment, hand-operated or otherwise, as required to safely place and compact paving materials.
- B. Comply with load limitations on structures.

3.03 PLACING THE MIX

- A. Place binder course, tack coat and wearing course in compliance with applicable GDOT Specification Sections, unless more stringent requirements are necessary to meet load limitations. Verify slope and planarity of every course prior to continuing work.
- B. Machine spread where possible.
- C. Hand placing:
 - 1. Spread, tamp and finish mixture using hand tools in areas where machine spreading is not possible.
 - 2. Place at a rate to insure compaction before mixture cools.
- D. Joints:
 - 1. Carefully make joints between successive days' work. Ensure a continuous bond between adjoining work.
 - 2. Construct joints to have same texture, density and smoothness as adjacent sections of asphalt concrete course.
 - 3. Offset joints from course to course a minimum of six (6) inches.

3.04 COMPACTING THE MIX

- A. Provide sufficient rollers to obtain required pavement density.
- B. Begin rolling operations as soon as mixture will bear weight of roller without excessive displacement.
- C. Do not permit heavy equipment, including rollers to stand on finished surface before it has thoroughly set.
- D. Compact mixture with hot hand tampers or vibrating plate compactness in areas inaccessible to rollers.
- E. Patching of New Asphalt Concrete:
 - 1. Remove and replace defective areas.
 - 2. Cut out and fill with fresh, hot asphalt concrete.
 - 3. Compact by rolling to specified surface density and smoothness.
 - 4. Remove deficient areas for full depth of course.
 - 5. Cut sides perpendicular and parallel to direction of traffic with edges vertical.
 - 6. Apply prime or tack coat as appropriate to exposed surfaces before placing new asphalt concrete mixture.

3.05 CLEANING AND PROTECTION

- A. After completion of paving operations, clean surfaces. Any oil spills (hydraulic, diesel, motor oil, etc.) must be completely removed, either by chipping out or removing and replacing with new, keyed in asphalt. The minimum depth of any asphalt replacement shall be one inch.
- B. Protection:

1. After final rolling, do not permit vehicular traffic on asphalt concrete pavement.
2. Provide barricades and warning devices as required to protect pavement and the general public.

END OF SECTION

Attachment B

13mm Latex Track System

PART 1 GENERAL

1.01 Scope

The synthetic surfacing contractor shall furnish all labor. Materials, equipment, supervision, and services necessary for the proper completion of all Synthetic Track Surfacing and related work indicated on the drawings and specified herein.

The synthetic surfacing contractor shall refer to the drawings for the required locations of synthetic track surfacing to be installed. All quantities and dimensions shall be field verified by the synthetic surfacing contractor.

1.02 Specific Scope of Work

- A. Install a porous latex and rubber synthetic track system comprised of layers of latex bound SBR rubber granules topped with a spray-applied pigmented UV resistant latex top coat.
- B. Layout and paint all track lines and event markings as required and specified by appropriate governing body (IAAF, NCAA or NFHS rules).

1.03 Coordination

The synthetic surfacing contractor shall coordinate the work specified with an authorized and appointed representative of the owner so as to perform the work during a period and in a manner acceptable to the owner.

PART 2 CODES AND STANDARDS

2.01 Applicable Publications

Codes and standards follow the current guidelines set forth by (International Amateur Athletic Federation (IAAF), National Collegiate Athletic Association (NCAA) or the National Federation of State High School Association (NFHS)) along with the current material testing guidelines as published by the American Society of Testing and Materials (ASTM).

2.02 Performance Standards

The new synthetic track surfacing system shall exhibit the following minimum performance standards (ASTM).

- A. Thickness: (12-13mm) or as specified Shore A Hardness: 45-60 (ASTM D- 2240)
- B. Elongation at Break: -75% (ASTM D-412)
- C. Compression Set Recovery: 85%-90% over 24hr period (ASTM 395-89)
- D. Abrasion Resistance: 0.25 grams loss after 1000 cycles (ASTM D-501)
- E. Coefficient of Friction; Dry: 0.75-0.80, Wet: 0.70-0.75 (ASTM D-1984)
- F. Resilience: 35%-41% (ASTM D-26321)
- G. Tear Resistance: 45 psi (ASTM D-624)

PART 3 QUALITY ASSURANCE

3.01 Contractor Qualifications

- A. The synthetic surfacing contractor must be in the business for five years in the installation of elastomeric latex and rubber synthetic track surfacing.
- B. The synthetic surfacing contractor must have installed a minimum of five outdoor track facilities using the specified system. Within the last two years.
- C. The synthetic surfacing contractor shall be a builder member of the American Sports Builders Association.
- D. The synthetic surfacing contractor shall employ a Certified Track Builder (CTB) to oversee this project.

3.02 Submittals

The following submittals must be received with bid:

- A. Standard printed specifications of the synthetic track surfacing system to be installed on this project.
- B. An affidavit attesting that the synthetic track surfacing material to be installed meets the requirements defined by the manufacturers currently published specifications and any modifications outlined in those technical specifications.
- C. A synthetic track surfacing system sample, 4" x 4" in size of the same synthetic surfacing system to be installed on this project.
- D. An installation list of outdoor track facilities installed in the last two years using the exact synthetic track surfacing system specified herein.

PART 4 MATERIALS

4.01 Primers

Primer shall be water-based SBR latex. Specifically formulated to be compatible with the asphalt/concrete base and track surfacing material.

4.02 Black SBR Granules

The rubber granules for the base course shall be recycled SBR rubber. Processed and chopped to 1-5 mm size. The midcourse shall be 1-4mm in size and the surface course shall be 1-3mm in size containing less than 4% dust.

4.03 Colored Red EPDM Granules

The rubber granules for the structural wearing coats shall be EPDM peroxide cured, synthetic rubber containing a minimum 20% EPDM resin (1-3mm), with a specific gravity of $1.50 \pm .1$ g/cubic centimeters. The EPDM rubber shall be the same color as chosen by the owner and specified within.

4.04 Latex Binder

Binder for the black mat shall be a minimum of 50% solid SBR latex resin used for latex track construction.

4.05 Pigments

Pigments shall be ultra violet stabilized water based pigments.

4.06 Line Marking Paint

All line and event markings shall be applied by experienced personnel utilizing an acrylic paint compatible with the synthetic track surfacing.

PART 5 INSTALLATION

5.01 Sub-base

The Synthetic Track Surfacing System shall be laid on an approved sub-base. The general contractor shall provide compaction test results of 95% or greater for the installed sub-base and asphalt surface.

For NCAA and IAAF certification the following criteria must be followed. The track surface .i.e. asphalt sub-strate, shall have a maximum lateral slope outside to inside of 1.0% and a maximum slope of 0.1% in the running direction. The finished asphalt shall not vary under a 10' straight edge more than 1 /8".

It shall be the responsibility of the asphalt-paving contractor to flood the surface immediately after the asphalt is capable of handling traffic, but within 24 hours. If, after 20 minutes of drying time, there are birdbaths evident. It shall be the responsibility of the surfacing contractor to determine the method of correction. No cold tar patching, skin patching or sand mix patching will be acceptable.

Any oil spills (hydraulic, diesel, motor oil, etc.) must be completely removed either by chipping out or removing and replacing with new, keyed in asphalt. The minimum depth of any asphalt replacement shall be 1 inch. The curing time for the asphalt base is 28 days. It shall be the responsibility of the surfacing contractor to determine if the asphalt substrate has cured sufficiently prior to the application of latex and rubber surfacing system.

It shall be the responsibility of the general contractor to determine if the asphalt substrate meets all design specifications, i.e. cross slopes, planarity and specific project criteria. After all the above conditions are met, the synthetic surfacing contractor must, in writing, accept the planarity of the asphalt receiving base before work can commence.

5.02 Thickness

The thickness of the Synthetic Track Surfacing System shall be 13mm. or as specified.

5.03 Equipment

The Synthetic Track Surfacing System components shall be processed and installed in specially designed machinery and equipment, an approval mixer tank with mechanical agitation and the capability to maintain the required pressure for spraying.

5.04 Installation (.74 gallons of undiluted latex, 7.65 lbs. SBR rubber and 5.1 lbs. Red EPDM colored rubber per sq. yd.)

- A. Prime coat of diluted latex applied at .04 gallons per square yard.
- B. Base rubber applied and over sprayed with .13 gallons of latex per square yard.

- C. Mid-Course rubber applied and over sprayed with .13 gallons of latex per square yard.
- D. Mid-Course rubber applied and over sprayed with .13 gallons of latex per square yard.
- E. Surface Course rubber applied and over sprayed with .13 gallons of latex per square yard.
- F. Surface course rubber applied and over sprayed with .13 gallons of latex per square yard.
- G. Spray applied pigmented U.V. stabilized coat of .05 gallons of latex per square yard.

5.05 Site Conditions

- A. Installation shall not take place if adjacent or concurrent construction generates excessive dust, abrasives or any other by-product that, in the opinion of the installer, would be harmful to the track material, until completion of such works.
- B. If, in the opinion of the installer of the synthetic material, the weather and/or climatic conditions are detrimental to the proper installation of the surfacing materials, work shall be delayed until conditions are acceptable. Preferred installation temperature is fifty degrees Fahrenheit and rising. Installation shall be executed only in dry conditions.

PART 6 LINE STRIPING AND EVENT MARKINGS

6.01 Layout

Line striping and event markings shall be laid out in accordance with current IAAF, NCAA or NFHS rules.

6.02 Certification

Upon completion of the installation, the owner shall be supplied with all necessary computations and drawings, as well as a letter of certification attesting to the accuracy of the markings.

PART 7 - GUARANTEE

Synthetic track surfacing system shall be fully guaranteed against faulty workmanship and material failure for a period of 3 years from the date of acceptance.

Synthetic surfacing material found to be defective as a result of faulty workmanship and/or material failure shall be replaced or repaired at no charge upon written notification within the guarantee period.

Attachment C

Track Equipment Specifications

PART 1 GENERAL

1.01 SCOPE OF WORK

- A.** Provide all equipment and materials, and do all work necessary to furnish and install the athletic equipment, as indicated in the RFP and as specified herein. Track equipment shall include, but not be limited to:

1. TFLT016SS High School 16" Take-Off Board

1.02 RELATED WORK

- A.** Examine contract documents for requirements that affect work of this section. Other specification sections that directly relate to the work of this section include, but are not limited to:

1. Attachment A – Running Track Asphalt Paving
2. Attachment B – Synthetic Track Surfacing System

1.03 REFERENCES

- A.** Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.

1. National Federation of State High School Associations (NFHS)
2. National Collegiate Athletic Association (NCAA)
3. International Amateur Athletic Association (IAAF)
4. American Sports Builders Association (ASBA)
5. American Wood Preserver's Association (AWPA)
6. Manufacturers Data and Recommended Installation Requirements

1.04 SUBMITTALS

- A.** Manufacturers Product Data

1. Provide manufacturers product data prior to actual field installation work, for the Owners representative's review.

- B.** Shop Drawings

1. Provide drawings of the manufacturers recommended installation and foundation requirements prior to actual field installation work, for the Owners representative's review.

1.05 QUALITY ASSURANCE

- A. Manufacturers warranties shall pass to the Owner and certification made that the product materials meet all applicable grade trademarks or conform to industry standards and inspection requirements.

1.06 PRODUCT DELIVERY AND STORAGE

- A. Materials delivered to the site shall be examined for damage or defects in shipping. Any defects shall be noted and reported to the Owners representative. Replacements, if necessary, shall be immediately re-ordered, so as to minimize any conflict with the construction schedule. Sound materials shall be stored above ground under protective cover or indoors so as to provide proper protection.

PART 2 PRODUCTS

2.01 High School 16" Long/Triple Jump Take-Off Board

- A. BASE: TFLT016SS High School 16" Take-Off Board as manufactured by:

Sportsfield Specialties Inc., P.O. Box 231, Delhi, NY 13753 (888-975-3343)
- B. COMPONENTS:
 - 1. High School Model # TFLT016SS, 16.0in Stainless Steel Tray, with Aluminum Insert containing double surface support and 0.75in White Marine Grade Plywood Board, Stainless Steel Adjustment Bolts. Overall Dimensions: 2.81in x 16.0in x 48.0in

PART 3 EXECUTION

3.01 INSTALLATION OF EQUIPMENT

- A. All athletic equipment shall be installed as recommended with manufacturer's written directions, and as indicated on the drawings.

END OF SECTION

SYNTHETIC TRACK SURFACING- SPURTAN® BS SPECIFICATION

PART 1- GENERAL

1.01 SUMMARY

A. The contract work to be performed under this section consists of furnishing all required labor, materials, equipment, implements, parts and supplies necessary for, the surfacing in accordance with these specifications and indicated on the drawings.

1. Spurtan® BS – A 13mm polyurethane bound running track surface with a structural spray finish.

1.02 CODES AND STANDARDS

A. Codes and standards follow the current guidelines set forth by the International Associations of Athletics Federation (IAAF), the National Collegiate Athletic Association (NCAA) or the National Federation of State High School Associations (NFHS).

1.03 SUBMITTALS AND SUBSTITUTIONS

A. Request for deviations or substitutions from the specifications must be made in writing seven days prior to the bid date. Complete product data including specifications, application rates, mixing instructions and a sample shall be sent with the request to the district and/or its agent for an evaluation. Alternatives will be allowed only by addendum.

1. Submit three (3) sets of manufacturer's product data sheets including installation guidelines and maintenance guidelines.

2. Submit three (3) representative track samples in the color of surfacing to be installed.

3. Submit Material Safety Data Sheets (MSDS) or Safety Data Sheets (SDS) for all individual components of the system to be installed.

4. Submit evidence that the synthetic surfacing contractor is a member of the American Sports Builders Association (ASBA)

1.04 QUALITY ASSURANCE

A. The track surface installer shall be authorized by APT (Manufacturer) and possess a minimum of ten (10) years' experience of installing the specified system.

B. The supervisor of the installing company must have ten (10) years' experience in surfacing with the specified polyurethane system. A letter of certification must accompany the bid proposal.

C. The supervisor, of the installing company, must have installed a minimum of ten (10) IAAF certified track systems, within the last three (3) years. A letter of certification from the manufacturer must accompany the bid proposal.

D. The manufacturer (APT) must represent a minimum of four (4) IAAF approved track systems.

E. All material components must be procured and manufactured from APT, a single source. No substitutes allowed.

F. All polyurethanes used must be manufactured by APT an ISO 9001 and ISO 14001 Certified Company. Manufacturer's ISO 9001 and ISO 14001 certificate must accompany bid.

1.05 SITE CONDITIONS

A. Weather: Surfacing shall not begin if rain is imminent, if gusting winds are occurring or when the threat of freezing exists within 24 hours.

B. Site: During any surfacing and striping, sprinkler systems must be shut off or controlled so that no water falls on the track or event area surfaces. Other trades and school district personnel must stay off the wet or curing surface.

C. Only mix and apply when meeting manufactures recommended guidelines.

D. The General Contractor shall provide temporary barriers as required to prevent public entry to construction area and to protect adjacent properties from damage during construction operation.

1.06 WARRANTY

A. Provide manufacturers standard five (5) year warranty.

PART 2- PRODUCTS

2.01 SUPPLIER

A. Advanced Polymer Technology
109 Conica Lane/PO Box 160
Harmony PA 16037
724-452-1330

2.02 MATERIALS

A. Spurtan® BS – A 13mm polyurethane bound running track surface with a structural spray finish.

Materials include:

1. Qualipur Polyurethane primer
2. SBR Black Rubber
3. Qualipur Polyurethane binder
4. Melos EPDM Spray Rubber
5. One Component Qualipur Structural Spray

PART 3- EXECUTION

3.01 EXAMINATION

A. The General Contractor shall verify that all asphalt/concrete paving meets all dimensional accuracy, strength, and compaction. Notify owner of any deficiencies. Recommended compaction of asphalt and sub base is 95%.

B. The General Contractor shall verify that all concrete work meets all required tolerances. Notify owner of any deficiencies.

C. Upon completion of paving, it is the responsibility of the paving contractor to water flood the surface with the use of a water truck. If after 30 minutes on a 70° F day, "bird bathes" are evident in a depth more than 1/8" the paving contractor, track surfacing contractor and the owner's representative will determine the best method of correction.

3.02 PRODUCT AND MATERIAL DESCRIPTION

A. The Spurtan® BS – A 13mm polyurethane bound running track surface with a structural spray. The base layer is a paved in place rubber granule and a Qualipur polyurethane binder basemat. Two coats of a mixture of colored Qualipur Structural Spray and Melos EPDM spray rubber are then structurally sprayed onto the base to form a textured finish.

B. Rubber (Black SBR): The basemat rubber shall be specifically graded Styrene Butadiene Rubber (SBR). SBR is to be dried to no less than 2.5% moisture and sealed in bags.

C. Polyurethane Binder: The basemat shall be bound by moisture-cured, Qualipur polyurethane, compatible with the basemat rubber. No asphaltic emulsions or epoxies are allowed in the basemat. Installation of the basemat shall take place with a specially designed track-paving machine to an average depth of 11 mm. No sprayed basemat systems will be allowed.

D. One Component Structural Spray: The basemat shall be coated by a pigmented, one component, Qualipur polyurethane resin based, structural spray mixed with Melos spray rubber.

3.03 APPLICATIONS PROCEDURES

A. The entire asphalt or concrete track surface shall be clean and free of dirt, oil, grease or any other residue upon arrival of the installation team. Any dirt, etc. shall be pressure washed off the base by the general contractor.

B. Prime entire surface area with a compatible Qualipur polyurethane primer. Mask and protect adjacent structures, as required. Primer shall dry to a tack-free condition, but no longer than 24 hours, for application of basemat. The consumption rate is 0.29 lbs/sy (0.16 kgs/sm).

C. Mix the binder and granules until all rubber is thoroughly coated transport onto to the track and apply using a paving machine that is specifically designed for this type of application. For an average 11 mm mat the consumption is 14.94 lbs/sy (8.11 kgs/sm) of SBR rubber and 3.52 lbs/sy (1.91 kgs/sm) Qualipur binder. Apply to the specified thickness.

D. Mix the structural spray and spray rubber until thoroughly coated. The mixture should be sprayed in two separate applications. Apply the second coat, in an opposite direction as to the first. The minimum application rate is 2.16 lbs/sy (1.17 kgs/sm) for the Qualipur structural spray and 1.44 lbs/sy (0.78 kgs/sm) EPDM spray rubber. Apply specified amounts to achieve proper coverage.

3.04 STRIPING

A. All line marking paint shall be compatible and approved for the synthetic surfacing. Only an experienced track-striping specialist shall perform the line striping.

END OF SPECIFICATION – SPURTAN® BS SYSTEM

Rev 1 GT/JC 3/19/14