Design and Construction Components

Design and Construction Components of Synthetic Fields

CONCEPT

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CONSTRUCTION

COMPLETION

MAINTENANCE

LIFECYCLE PLANNING

SYNTHETIC TURF SPORTS FIELDS



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Manual Page 1

DESIGN AND CONSTRUCTION COMPONENTS OF SYNTHETIC FIELDS

Presented by

Mark Nicholls

CONTACT INFORMATION

CELL: 905-327-5501

EMAIL: markn@turfindustry.com

Design and Construction Components

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Speaking Engagements and Educational Provider

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Mark Nicholls – President and Founder of TURFindustry UBU Sports – CEO and President

Over 27 years of direct experience In the synthetic turf industry

Started as an installer and has personally completed 100's of successful projects

Built one of the top brand in North America

Created installation training university

Established world class R&D Center

Built largest independent manufacturing facility in North America



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NAVAGATION BAR:

Each of the presentation slides features a useful navigation bar to assist in the organization of today's presentation.

CONCEPT

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SYNTHETIC TURF
FIELD PROJECT

Design and Construction Components

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Design and Construction Components of Synthetic Fields

CONCEPT

DESIGN:

Programming -Consideration

Request for Proposal Concep

PROCESS CONSIDERATIONS

Determine specifically who will out as the name is responsible.

DESIGN PROFESSIONAL CONSIDERATI

SPORTS TURF / FACILITY MANAGER CONSIDERATION

DESIGN

CONSTRUCTION

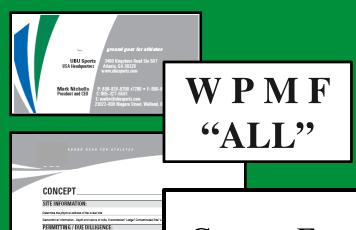
COMPLETION

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HOUSEKEEPING:

Questions?





Contact Email:

Markn@turfindustry.com

Cell: 905-327-5501

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COURSE MANUAL

Design and Construction Components of Synthetic Fields

CONCEPT

DESIGN

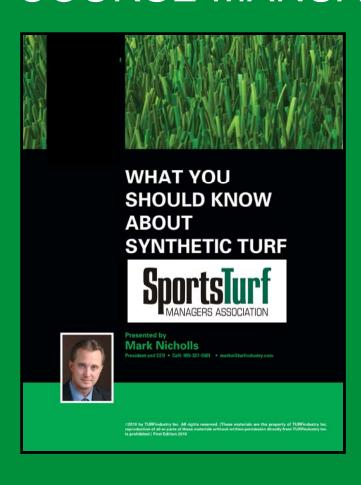
CONSTRUCTION

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LIFECYCLE PLANNING

COURSE MANUAL:



MANUAL

- **✓** User Friendly Layout
- **✓** Comprehensive Material
- **✓** Wealth of Reference Materials

Contact Email:

Markn@turfindustry.com

Cell: 905-327-5501

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COURSE MANUAL:



MANUAL INDEX

- ✓ Meant to be a useful reference tool
- ✓ Easy access to useful documents

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Markn@turfindustry.com

Cell: 905-327-5501

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THUMBNAILS

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COURSE MANUAL:

	Synthetic Turf Sports Fields Design and Construction Components of Synthetic Fields NUAA4 - Leadership Training Course £21	SportsTurf
COLOR TO COL	Foundation of the most organisation	
Single spinors and	Turn System and Aprilian Falls Internal System and Internal Syste	
Synthetic Turk Synthetic Turk Senge and Connectator Cong	Curl System: baseing make a different base of the curl	8

PRESENTATION THUMBNAIL

- **✓** Presentation Thumbnail
- ✓ Useful format to take notes
- ✓ Allow you to enjoy the educational event

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ACCEDITATION EXAM

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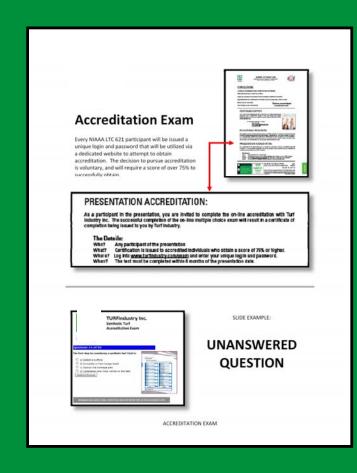
CONSTRUCTION

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COURSE MANUAL:



ACCREDITATION EXAM

- **✓ TURFindustry Accreditation**
- ✓ Must score 75% or higher
- **✓** Receive Framed Certificate
- **✓** Demonstrate Knowledge

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COURSE CONTENT

Design and Construction Components of Synthetic Fields

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COURSE MANUAL:



COURSE CONTENT

- ✓ The entire presentation is memorialized within the course manual
- ✓ Organized in chronological order of the projects development and in harmony with the presentation .

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APPENDIX - A

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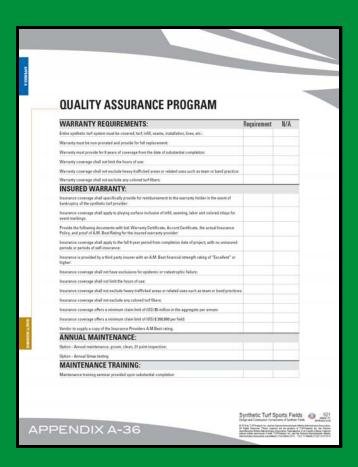
CONSTRUCTION

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COURSE MANUAL:



APPENDIX – A

"Checklist of Things to Consider"

- **✓** Index for ease of reference
- **✓** Checklist for each module
- ✓ Everything you need to consider
- ✓ Topic specific checklists at the back
- ✓ Potentially save you \$5K - \$10K in fees with professionals

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COURSE MANUAL:



APPENDIX – B "USAGE AUDIT"

- **✓** Usage Audit
- **✓** Sports Specific Use
- ✓ Optimize Performance for your sports specific use
- **✓** Maximize Player Safety
- ✓ No one surface can optimize performance and maximize player safety for every sports specific use.

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COURSE MANUAL: RECOMMENDATIONS BY SPORT

PRODUCT NAME	PRODUCT#	FOOTBALL	SOCCER	BASEBALL	LACROSSE	FIELD HOCKEY	MULTI-USE	INDOOR
SPEED S5-M	US5164APAM	BEST	BEST	BEST	BEST	GOOD	BEST	BETTER
SPEED S4-M	US4151APAM	BETTER	BETTER	BETTER	GOOD	GOOD	BETTER	GOOD
SPEED M6-M	US6164ATHM	BEST	BEST	BEST	BETTER		BEST	BETTER
SPEED M4-M	US4951ATHM	BETTER	BETTER	BETTER	GOOD	80	BETTER	GOOD
INTENSITY S5-R	UI5164APAR	BEST	BETTER	BETTER	BETTER	7	BETTER	BEST
INTENSITY S4-R	UI4151APAR	BETTER	GOOD	BEST	GOOD		BETTER	BETTER
INTENSITY M6-R	UI6164ATHR	BEST	BETTER	BETTER	BETTER		BETTER	BEST
INTENSITY M4-R	UI4951ATHR	BETTER	GOOD	BEST	GOOD		BETTER	BETTER
BALANCE SP82-M	UB8251APAM	BETTER	BEST	BEST	BETTER	GOOD	BEST	BETTER
BALANCE SP82-R	UB8251APAR	BEST	BETTER	BETTER	GOOD	×	BETTER	BEST
BALANCE SP82-P	UB8251APAP	600D	GOOD	GOOD	GOOD		GOOD	
BALANCE MN65-M	UB6538ATHM	GOOD	GOOD	GOOD	GOOD	GOOD	GOOD	GOOD
BALANCE MN65-R	UB6538ATHR	GOOD	GOOD	GOOD	GOOD	GOOD	GOOD	GOOD
BALANCE MN65-P	UB6538ATHP	GOOD	GOOD	GOOD	GOOD	10	GOOD	
BALANCE MN69-M	UB6944ATHM	GOOD	GOOD	GOOD	GOOD	GOOD	G00D	GOOD
BALANCE MN69-R	UB6944ATHR	GOOD	GOOD	GOOD	GOOD	GOOD	GOOD	GOOD
BALANCE MN69-P	UB6944ATHP	GOOD	GOOD	GOOD	GOOD		GOOD	
BALANCE MP80-M	UB8044ATHM	BETTER	BEST	BEST	BETTER	GOOD	BEST	BETTER
BALANCE MP80-R	UB8044ATHR	BEST	BETTER	BETTER	GOOD	GOOD	BETTER	GOOD
BALANCE MP80-P	UB8044ATHP	GOOD	GOOD	GOOD	GOOD	- 83	GOOD	
BALANCE MP69-M	UB6932ATHM	G00D	GOOD	GOOD	GOOD	BETTER	600D	BETTER
BALANCE MP69-R	UB6932ATHR	GOOD	GOOD	GOOD	GOOD	GOOD	GOOD	GOOD
BALANCE MP69-P	UB6932ATHP	GOOD	GOOD	GOOD	GOOD		GOOD	

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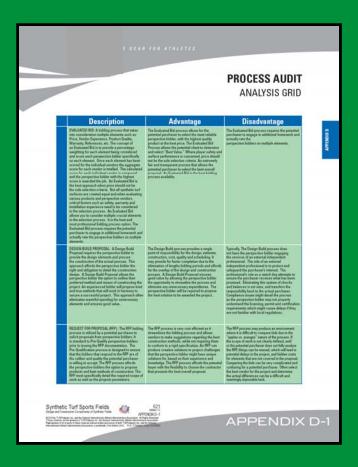
CONSTRUCTION

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LIFECYCLE PLANNING

COURSE MANUAL:



APPENDIX – D "Process Audit"

- ✓ Low Bid, Hard Bid, RFP, Evaluated Bid, etc
- **✓** Advantages
- **✓** Disadvantages
- ✓ Pitfalls

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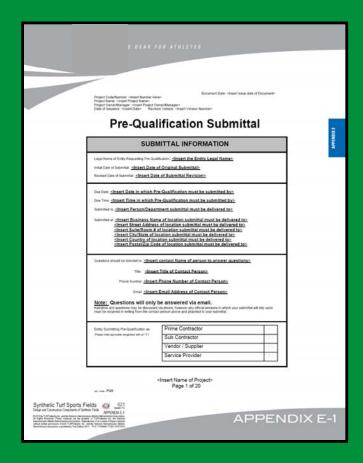
CONSTRUCTION

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COURSE MANUAL:



APPENDIX – E "Pre-Qualification Statement"

- ✓ A competitive process is required
- ✓ Qualify 3-5 vendors
- ✓ Any of which you would feel secure they could complete the project to your satisfaction

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COURSE MANUAL: BEST VALUE RATING SYSTEM

BIDDER'S SCORE: Calculate the Bidders Score summing the Individuals Scores for each component in Appendix B.	(Maximum Score 100)
BIDDER'S PRICE: Insert the Bidders price as submitted:	Bldder's price from the Bid Form
INTERNAL USE ONLY	
The Best Value Rating System (BVRS) that will be used is as follows: BIDDER'S SCORE (B-1) BIDDER'S PRICE (B-2) / 1,000,000	

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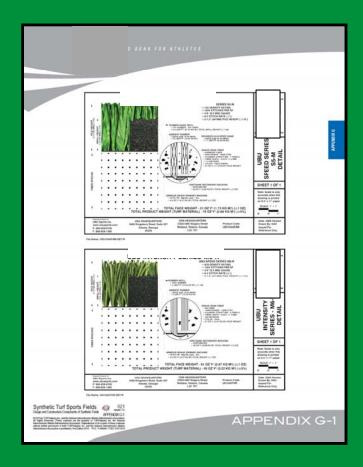
CONSTRUCTION

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COURSE MANUAL:



APPENDIX – G "Evaluation Criteria"

- ✓ Product Specification Sheet (PSS)
- ✓ Details the exact details of how the product is engineered
- ✓ Allows you to identify how the product has been built and what elements you need to include in the project specification documents

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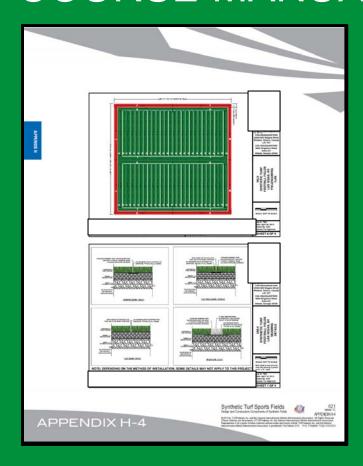
CONSTRUCTION

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LIFECYCLE PLANNING

COURSE MANUAL:



APPENDIX – H "Sample Drawing Set"

- **✓ Layout Drawings**
- **✓** Seaming Layout
- ✓ Markings, Logos, Lines, etc
- **✓** Seam Details

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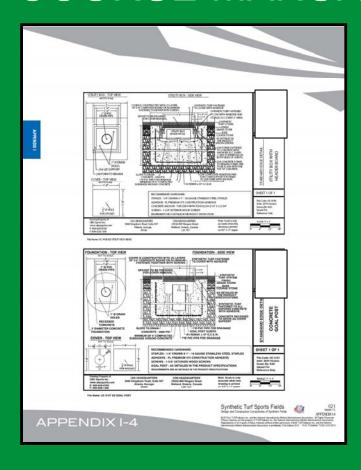
CONSTRUCTION

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COURSE MANUAL:



APPENDIX – I "Detail Drawing Set"

- **✓** Perimeter Detail
- **✓** Edge Interface
- ✓ Goal Post Foundation, etc.
- **✓** Drainage Details

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LIFECYCLE PLANNING

COURSE MANUAL:

		OPERATIONS CH
		FINAL OPERATIONAL
		DATE: LOCATION:
SYSTEMS		S TO BE CHECKED
☐ Plumbing		Concession Stands
☐ Irrigation	-	Restrooms
☐ Lighting		Locker and Dressing Rooms
☐ Electrical	_	Announcer Booths
☐ PA Audio		Press Boxes
☐ Communications		Spectator Stands
Other		Other
ADDITIONAL NOTES:		
WW 18 19 19 19 19 19 19 19 19 19 19 19 19 19		Other
ADDITIONAL NOTES: Project Manager		Deluxe Athletics
ADDITIONAL NOTES: Project Manager		Deluxe Athletics
ADDITIONAL NOTES:		Deluxe Athletics
ODDITIONAL NOTES:		Deluxe Athletics Signature Print Name
ADDITIONAL NOTES:		Deluxe Athletics Signature Print Name Architect
Project Manager signature Maintenance Representative signature		Deluxe Athletics Signature Print Name Architect Signature
Project Manager Signature Virint Name Maintenance Representative Signature Virint Name		Deluxe Athletics Signature Print Name Architect Signature Print Name Other
ADDITIONAL NOTES:		Deluxe Athletics Signature Print Name Architect Signature Print Name

APPENDIX - J

"Operational Checklist"

- **✓** Preconstruction Checklist
- **✓** Post Base Construction
- **✓** Final Inspection Checklist

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COURSE MANUAL:

APPENDIX – K PRESERVATION PACKAGES

Preservation Package	#1	#2	#3	# 4	#5	#6	#7	#8	# 9	#10
	ANNUAL	SEMI ANNUAL	QUARTERLY	MONTHLY	COMPLETE S	INGLE GROOF	ASAFETY TEST	INGSCARIFICA	ITIONSPRAY	OUTFILL
FIELD GROOMING Four Step Grooming Process	1Time	2 Times	4 Times	12 Times	26 Times	1Time				
Gmax TEST REPORT 20 Point Drop	1 Time	2Times	4Times	4Times	4Times		1 Time			
30 MINUTE MAINTENANCE TRAINING SEMINAR For Facility Maintenance Staff	1Time	1Time	1Time							
MAINTENANCE EQUIPMENT INSPECTION Galibration and Lube	1Time	1 Time	1 Time							
20 POINT FIELD SAFETY INSPECTION Covering All Aspects of the Surface	1Time	2 Times	4 Times	12 Times	26 Times	1Time	1Time			
MAINTENANCE CERTIFICATE ISSUED Authentic Certificate Documenting Service	1 Time	2 Times	4 Times	12 Times	26 Times	1 Time	1 Time	1Time	1 Time	1 Time
GENERAL CLEAN AND MINOR STAIN REMOVAL Trash Removal and General Area Treatment					26 Times					
24 EMERGENCY REPAIR SERVICE 52 Weeks					52 Weeks					
FIELD INFILL SCARIFICATION Gmax Testing-Report - Before and After								1Time		
FIELD SPRAY TREATMENT Sanitary and Health Treatment									1 Time	
FIELD INFILL REMOVAL "Cleaning, reapplication and disposal are quoted separately"										1Time

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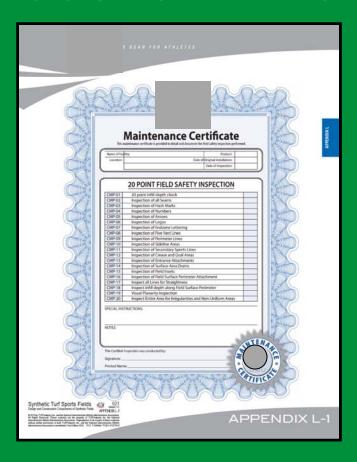
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COURSE MANUAL:



APPENDIX - L

"Maintenance Certificate"

- **✓** Issued For Every Site Visit
- ✓ Required Record Keeping
- **✓** Risk Management Program
- ✓ All External Maintenance Service

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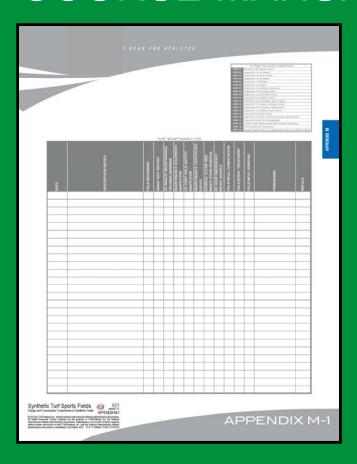
CONSTRUCTION

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COURSE MANUAL:



APPENDIX – M

"Maintenance Log"

- ✓ Record All Internal Maintenance Service
- ✓ Sweeping, Grooming, etc
- **✓** Required Record Keeping
- **✓** Risk Management Program

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COURSE MANUAL:



APPENDIX - N

"Maintenance Equipment"

- ✓ Various Maintenance Equipment Available
- **✓** Lists Manufacturer
- ✓ MRSP, Model Codes, etc
- ✓ Attachments and Accessories

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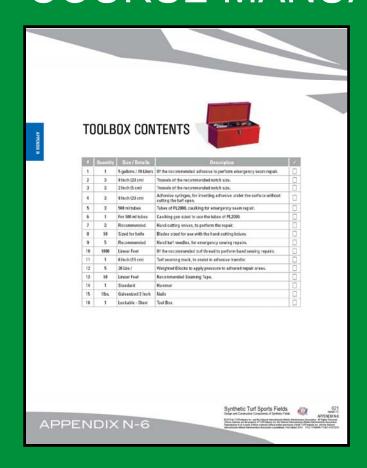
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COURSE MANUAL:



APPENDIX - N

"Toolbox"

- **✓** Emergency Repairs
- **✓** Hand Tools and Supplies
- ✓ Required For Any Minor Repairs
- **✓** Combination Lock

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COURSE MANUAL:



APPENDIX - O

"Testing Summary Description"

- ✓ Description Of All 21 ASTM Tests
- ✓ Performance, Product and Fiber Testing
- ✓ Determine Importance of the Various Tests
- ✓ Lead and Heavy Metal
- **✓ Quick Reference Guide**

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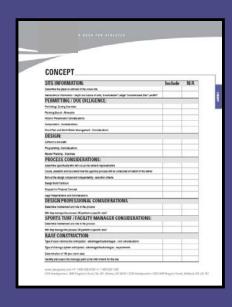
MAINTENANCE

LIFECYCLE PLANNING

CONCEPT: Introduction







Mass Acceptance
Professionals
Process
Scope of work
Requirements

Design and Construction Components

Design and Construction Components of Synthetic Fields

CONCEPT

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SYNTHETIC TURF SPORTS FIELDS

CONCEPT: Mass Acceptance





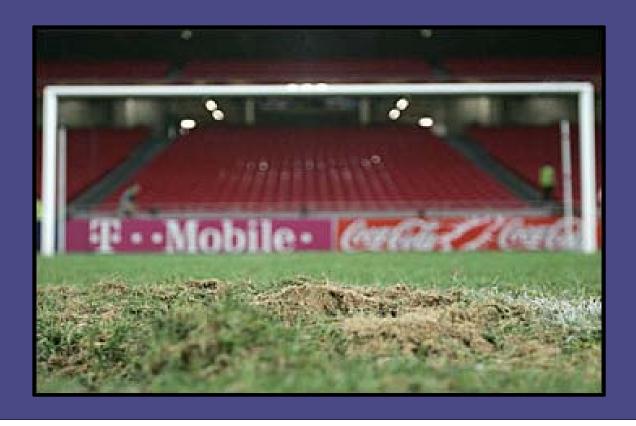
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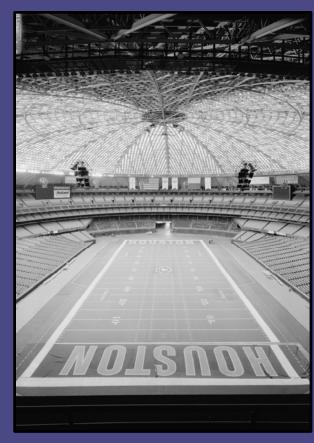
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CONCEPT: Mass Acceptance

The origin of the synthetic turf industry





Design and Construction Components

Design and Construction Components of Synthetic Fields

CONCEPT

DESIGN

CONSTRUCTION

COMPLETION

MAINTENANCE

LIFECYCLE PLANNING

SYNTHETIC TURF SPORTS FIELDS

CONCEPT: Mass Acceptance

By the numbers,...

SportsTurf
MANAGERS ASSOCIATION

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1998

82

fields

2010

1300 fields

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CONCEPT

DESIGN

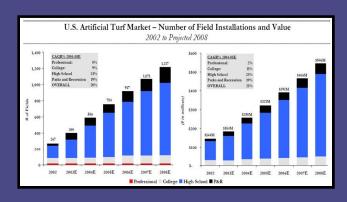
CONSTRUCTION

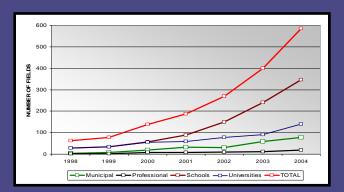
COMPLETION

MAINTENANCE

LIFECYCLE PLANNING

CONCEPT: Mass Acceptance





Projected Number of Fields by Facility Type for US Sports Turf Managers

							Multi-	Non-	Туре
Facility Type	N	Softball	Baseball	Football	Soccer	Other	Use	Ath	Total
Professional	296	16	343	358	70	203	55	8	1,052
College/University	2,418	2,591	2,245	5,268	4,059	2,677	3,282	3,023	23,144
Other Schools	19,500	79,990	72,827	75,612	79,990	33,827	109,837	27,459	479,541
Parks & Rec.	6,500	74,256	48,412	13,312	65,312	42,016	17,264	10,816	271,388
All Facility Types	28,714	156,852	123,827	94,550	149,431	78,722	130,437	41,305	775,124

Design and Construction Components

Design and Construction Components of Synthetic Fields

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CONCEPT: Mass Acceptance

What happens when an industry experiences exponential growth?













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What does that mean for the vendors?



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What does that mean for you?



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CONCEPT: Protective Sports Equipment



Ground Gear for Athletes

Design and Construction Components

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LIFECYCLE PLANNING

CONCEPT: Sports Specific Use

They perform different based on how they are constructed The safety aspects vary based on the products construction

- Type of fiber
- Gauge and stitch rate
- Source of infill and quality
- Installation process

Surprisingly ,...

Safety and performance varies even from the same vendor and with the same product from installation to installation



not all synthetic turf is EQUAL

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MAINTENANCE

LIFECYCLE PLANNING

CONCEPT: Professionals

Use Professionals

- Architects
- Engineers
- Landscape architects
- Civil engineers
- Soils analysts
- Surveyors
- Testing Lab as materials arrive to the site
- Certified sports field manager

Stay Directly Involved throughout the Process



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CONCEPT: Process

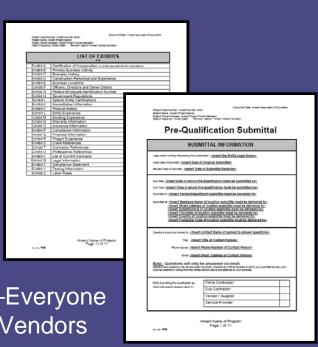
Type of bid process
First Step:

Prequalify vendors

- Pre-Qualification Submittal–Everyone
- Select 3-5 Best Qualified Vendors
- Don't waste their time, or yours
- Ability to spend equal time with limited number of vendors
- Respect for Vendors

The GOAL should be to approve a limited number of vendors,...

...Any of which selected, you are confident,
would successfully complete the project!



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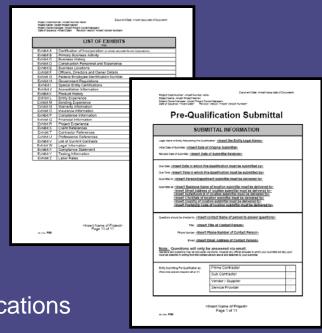
MAINTENANCE

LIFECYCLE PLANNING

CONCEPT: Process

Type of bid process

- RFP
- Design build
- Hard bid
- Low bid All about the Specifications
- Evaluated Bid
- BVRS (Best Value Rating System)



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CONCEPT: Process

Type of bid process

- RFP
- Design build





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CONCEPT

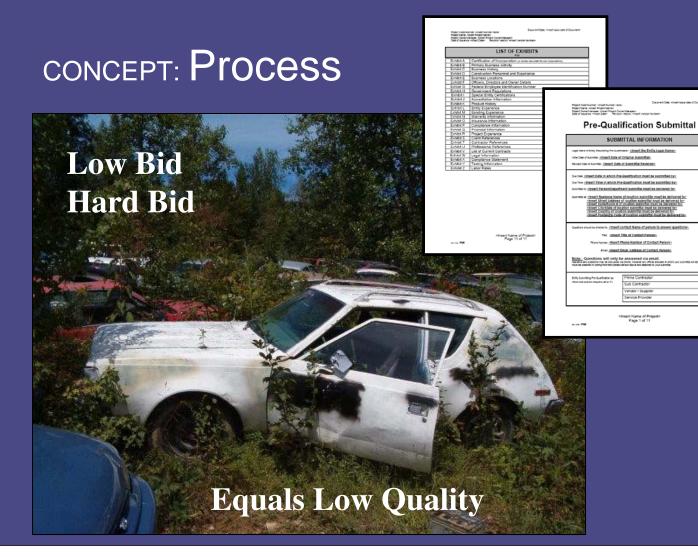
DESIGN

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CONCEPT: Process

Type of bid process

30% Price

20% Product

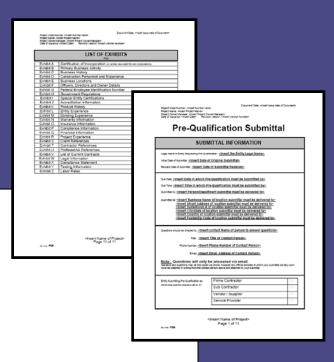
10% Company history

10% References

10% Site Visits

10% Warranty and insurance

10% Installation track record



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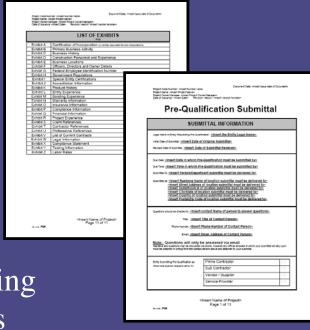
MAINTENANCE

LIFECYCLE PLANNING

CONCEPT: Process

Buying Groups

- Avoid the Hassle
- Cost Savings
- Reduced Procurement Timing
- Eliminate Legal Challenges



Requires Investigation

Design and Construction Components

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CONCEPT

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LIFECYCLE PLANNING

CONCEPT: Scope of Work

What is to be included in the Scope of Work?

- Base Construction
- Drainage
- Synthetic Turf
- Running Track
- Facility Improvements
- Related Sports Equipment
- Maintenance Equipment
- On-Going Maintenance Support



It is critical to establish the limit of work and clearly defining each individuals role throughout the process

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CONCEPT

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MAINTENANCE

LIFECYCLE PLANNING

CONCEPT: Requirements

- Process Requirements
- Administrative Requirements
- Permitting and Site Requirements
- Documentation Requirements
- Construction Requirements
- Surface Requirements
- Testing Requirements
- Assurance Requirements
- Sport Specific Requirements
- Warranty, Insurance and/or Bonding Requirements



Design and Construction Components

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CONCEPT

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MAINTENANCE

LIFECYCLE PLANNING

CONCEPT: Summary

- Complete a needs assessment
- Build a team of experienced professionals
- Invest time defining the scope of work
- Understand your requirements
- Plan for success



Ensuring a successful project starts with professional planning



Design and Construction Components

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SportsTurf

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DESIGN

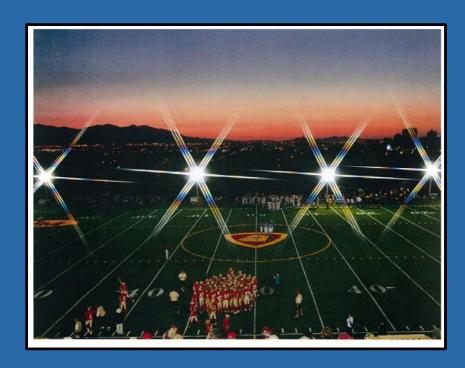
CONSTRUCTION

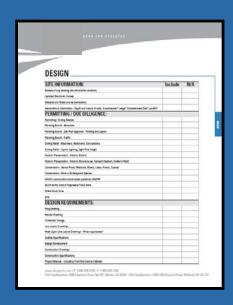
COMPLETION

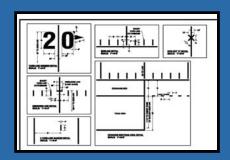
MAINTENANCE

LIFECYCLE PLANNING

DESIGN: Introduction







Design and Construction Components

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CONCEPT

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MAINTENANCE

LIFECYCLE PLANNING

DESIGN: BEWARE

Offer to "ASSIST"

Carefully crafted language to create an advantage.

Competitors Will!

Wolves in Sheep's Clothing



Design and Construction Components

Design and Construction Components of Synthetic Fields

CONCEPT

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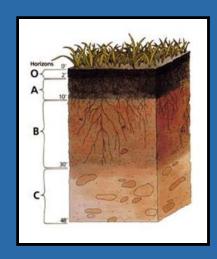
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DESIGN: Site Evaluation

- Existing Site Information
- Geotechnical information
- Permitting Requirements
- Zoning Considerations
- Planning Requirements
- Conservation Issues Wetlands / Endangered Species
- NPDES Construction Storm Water Permit w/SWPPP
- Flood Zone Issues ACOE / EPA / FEMA
- Planning Board Considerations Parking / Traffic
- Services Water / Electrical / Gas



Design and Construction Components

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MAINTENANCE

LIFECYCLE PLANNING

DESIGN: Bidding Requirements

Licenses, Registrations and Permits

Base Details

Drainage Details

Turf System

Document Submittals

Sample Submittals

Mandatory Testing

Insured Warranty

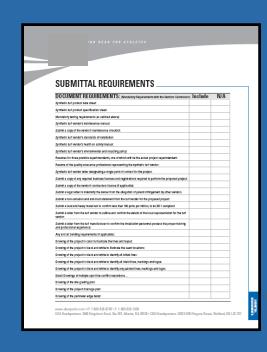
Bonding

Quality Assurance Program

Safety Assurance Program

Maintenance – (Service / Equipment / Training)

Sports Equipment



Design and Construction Components

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CONCEPT

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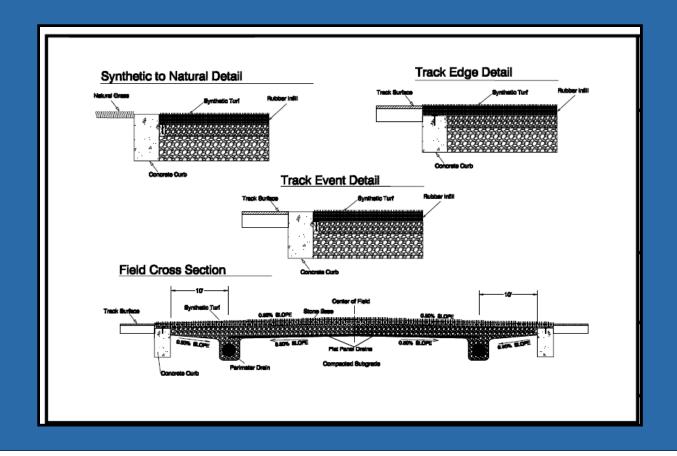
CONSTRUCTION

COMPLETION

MAINTENANCE

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DESIGN: Details - Base



Design and Construction Components

Design and Construction Components of Synthetic Fields

CONCEPT

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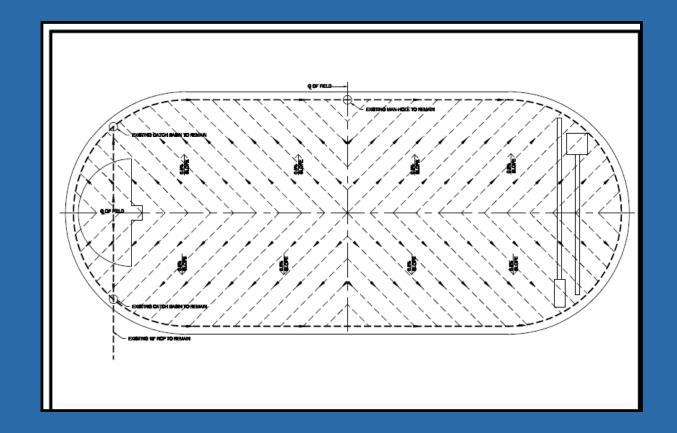
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DESIGN: Details - Drainage



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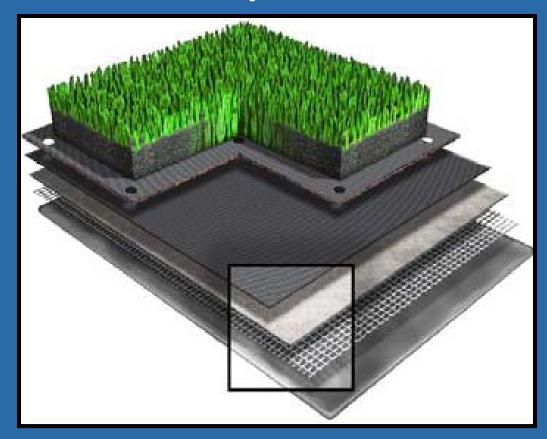
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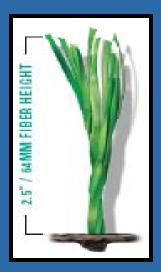
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DESIGN: Turf System - Construction







Design and Construction Components **Design and Construction Components of Synthetic Fields**

CONCEPT

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Why fiber is important?

DESIGN: Turf System - Fiber



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More fields have
Failed in the
Last 6 years, then
In the previous
40 years:
WHY?



Design and Construction Components

Design and Construction Components of Synthetic Fields

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DESIGN: Turf System - Fiber

How is fiber made?

- Resin Pellets are sucked up
- Mixed with Color Master Batch
- Melted down in liquid
- Forced out of a "Spinneret Plate"
- Solidified in cold Water
- Stretched and Processed

Design and Construction Components

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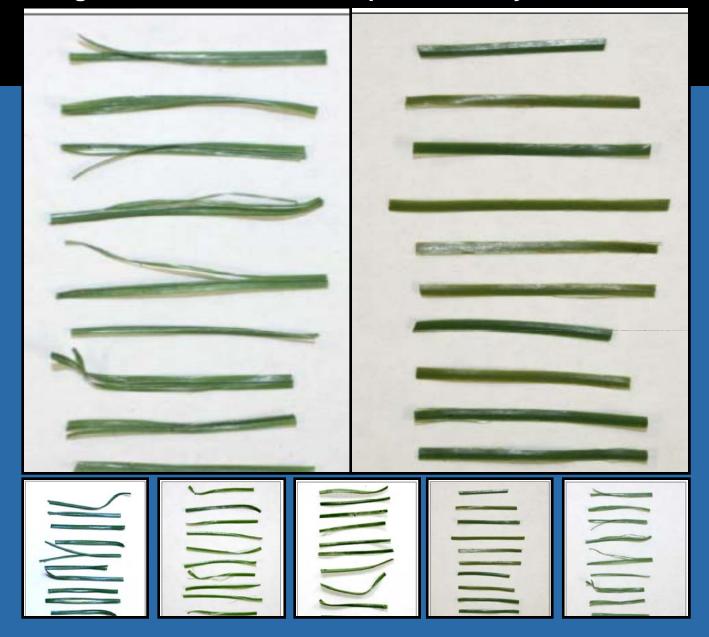
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Design and Construction Components of Synthetic Fields



Design and Construction Components

Design and Construction Components of Synthetic Fields

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SportsTurf
MANAGERS ASSOCIATION

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DESIGN: Turf System - Fiber

What makes the difference?

The quality of the resin utilized is key:

- C4 Grade
- C6 Grade
- C8 Grade



A "C8 Resin" provides the best Fiber – Cost More – But has a better return on investment!

Design and Construction Components

Design and Construction Components of Synthetic Fields

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Fibrillation	YES	
Structural Integrity	STRONG	
Tuftbind	GOOD	
Infill Encapsulation	GOOD	
Fiber Loss	LOW	



V.S.

MONO	FILAMENT	
		1 位置

Fibrillation	NO	
Structural Integrity	WEAK	
Tuftbind	POOR	
Infill Encapsulation	POOR	
Fiber Loss	HIGH	

Design and Construction Components

Design and Construction Components of Synthetic Fields

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DESIGN: Turf System - Fiber (Track Record)





SLIT FILM
Tape/Slit/Twisted
Rugged/Durable





MONOFILAMENT Individual/Wrapped Spaghetti Like

1996 – Over Fibrillations - Extended Warranties / 2005 Mono Launch-Straight Replacement

Design and Construction Components

Design and Construction Components of Synthetic Fields

CONCEPT

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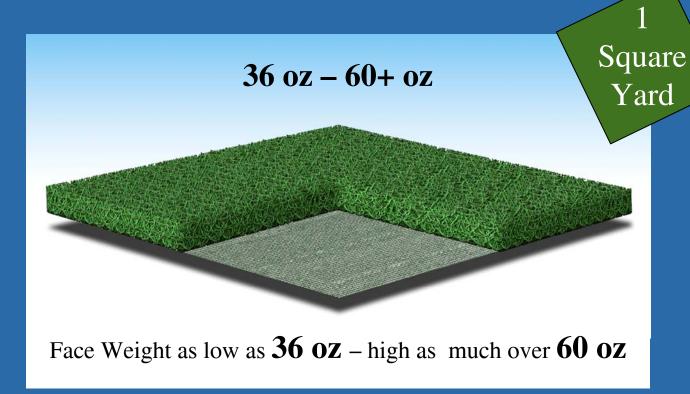
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DESIGN: Turf System - Fiber (Face Weight)



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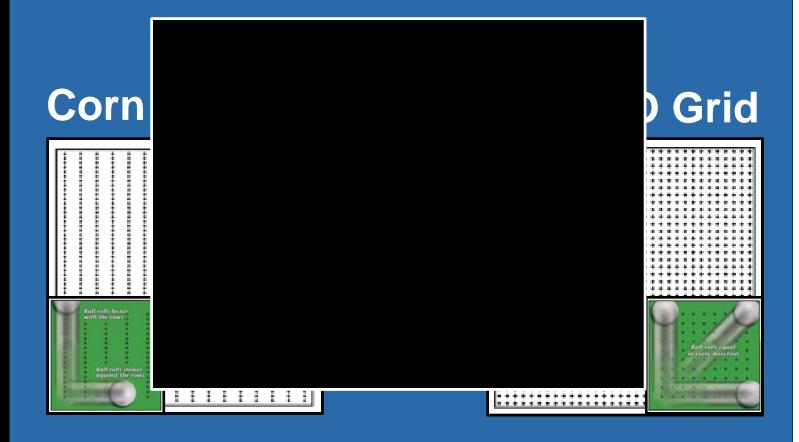
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DESIGN: Turf System - Construction (Spacing)



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CONCEPT

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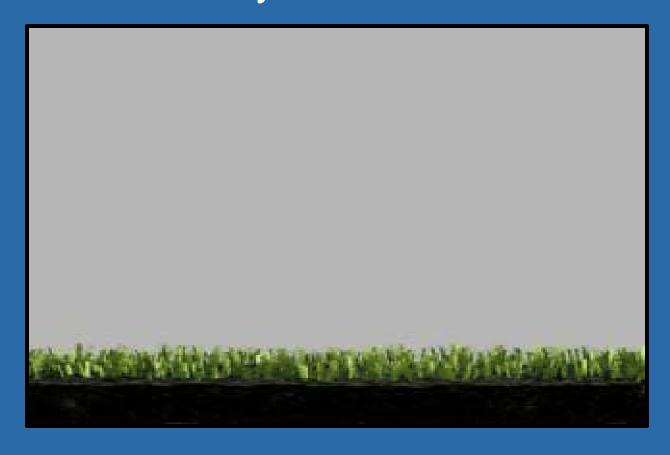
CONSTRUCTION

COMPLETION

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DESIGN: Turf System - Construction (Flyout)



Design and Construction Components **Design and Construction Components of Synthetic Fields**

CONCEPT

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DESIGN: Turf System - Construction (Tuft Gauge)



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TUFT GAUGE – 3/4"



TUFT GAUGE – 3/8"

Design and Construction Components

Design and Construction Components of Synthetic Fields

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SYNTHETIC TURF SPORTS FIELDS

DESIGN: Turf System - Construction (HUD Density)



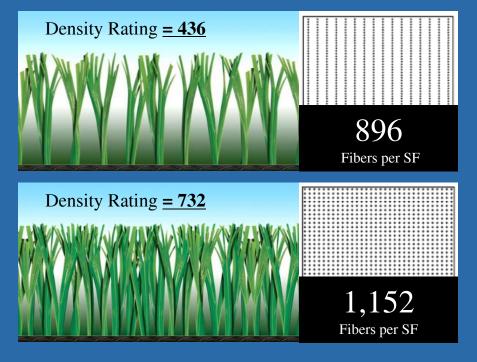
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HUD Density Calculation:

= 36 Face Weight
Pile Height

Target 600 -800

Design and Construction Components

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Design and Construction Components of Synthetic Fields

CONCEPT

DESIGN

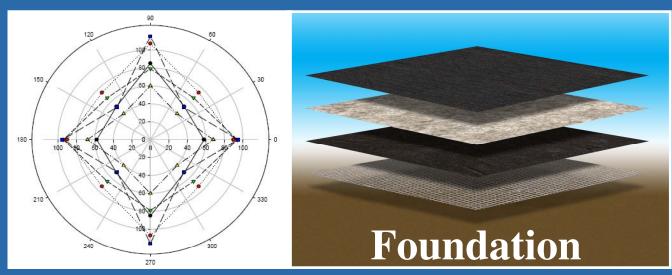
CONSTRUCTION

COMPLETION

MAINTENANCE

LIFECYCLE PLANNING

DESIGN: Turf System - Backing



Secure Top Shield
Durable Foundation
Proven Dimensional Stability
Improved Fiber Retention
Enhanced Seaming Properties

of the entire system



Design and Construction Components

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Design and Construction Components of Synthetic Fields

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DESIGN: Turf System - Infill

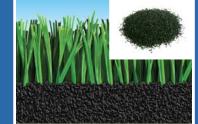
Infill options – (No Magic Potions!!)

- 100% Rubber
- Rubber and Sand mixture
- Rubber and Sand layered



Determination comes from the specific sport / activity

100% Rubber



Sand & Rubber



Note: No durability, performance, or safety issue Between <u>ambient</u> ground rubber and <u>cryogenic</u> rubber



Design and Construction Components

Design and Construction Components of Synthetic Fields

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DESIGN: Turf System - Seaming Seams do make a difference,...



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Chemical Seam



Adhered Seam

Sewn Seam



Lap Seam



Flat Seam

Hybrid Seam



Flat Weld

...and understanding your options is important!

Design and Construction Components

Design and

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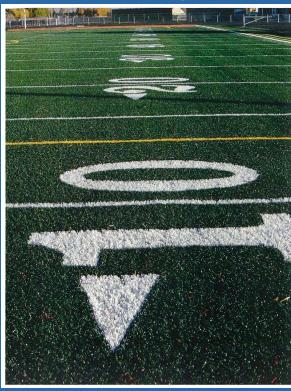
DESIGN: Turf System - Lines & Markings

LINE TYPES

Inlaid Lines

Painted Lines

Routed Lines



Warning: Routed Lines Should Never Be Utilized

Design and Construction Components

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DESIGN: Details - Equipment

Football Goal Posts and Sleeves

Football Game Equipment (Markers, Dial A Down, etc)

Soccer Goals

Soccer Game Equipment (Corner Flags, etc.)

Baseball Bases and Anchors

Pitchers Mound

Baseball Foul Poles

Paint Application Equipment

Templates and Stencils

Benches

Lighting

Fencing

Utility Vehicles

SPORTS EQUIPMENT CONSIDERATION	_	
SPORTS EQUIPMENT CONSIDERATION	_	
SPORTS EQUIPMENT CONSIDERATION	_	
SPORTS EQUIPMENT CONSIDERATION	_	
SPURIS EQUIPMENT CONSIDERATION		
	ა	-
	Include	N
Football goal posts: Consider width for specified use, Professional, NGAA, High School for example MA and TX play by NCAA rules		
and TX play by NCAA rules; Feotball goal post sleaves:		H
Football goal line markers:		t
Football disk-a-down indicator		t
Football goal post streamers:		Н
Football ground spotter:		t
Football sidelina tarp covers		T
Football yard line markers:		Г
Secon geals:		
Soccar goal wheal transport system		
Socoar goal anchor weights		
Seconnels:		L
Secournal page		L
Social comer flags (spring base):		L
Baseball topper roll material:		L
Baseball bases		L
Baseball base anchors		L
Baseballhome plate:		H
Basebali battar's box lamplate:		H
Baseball pitcher's rubber:		H
Baseball portable pitcher's mound:		H
Baseball state plug Baseball windscreens:		Н
Basebal outfield distance markers:		H
Baseball foul prior		t
		t
Baseball - Bectrical connection for JUGS machine.		

Design and Construction Components

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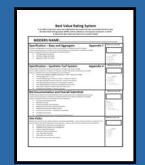
MAINTENANCE

LIFECYCLE PLANNING

DESIGN: Evaluation Criteria

Base and Drainage Construction	20 Points
Synthetic Turf System	20 Points
Bid Documentation & Overall Submission	20 Points
Site Visits	15 Points
Warranty and Insurance	10 Points
Mandatory Drawing Requirements	10 Points
Installation References	5 Points

BIDDER'S SCORE = Vendors
BIDDER'S PRICE / 1,000,000 = BVRS





Design and Construction Components Design and Construction Components of Synthetic Fields

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DESIGN: Vendor Selection

Installation is Everything!

An Experienced, Professionally Trained and Certified Installation Crew is critical to the successful completion of the project!





The synthetic turf industry has been built on the backs "and knees" of passionate professionals that take pride in every field they install!

Design and Construction Components

Design and Construction Components of Synthetic Fields

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DESIGN: Submittal - Documentation

Grading Plan
Drainage Plan
Edge Details
Shop Drawings
Synthetic Turf Product Data Sheet
Synthetic Turf Specification Sheet
Mandatory Testing Requirements
Lead and Heavy Metal Testing
Installation References
Maintenance Manual
Health and Safety Policy
Environmental Policy
Recycling Policy

Insured Warranty
Acord Certificates
Insurance Documentation
Insurance Carrier Rating
Installation Standards
Bonding Requirements
Quality Assurance
Anti Trust Statement
Installation Standards
License and Registrations
Indemnification Letter
Proposed Schedule

Design and Construction Components

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DESIGN: Submittal - Samples

12" by 12" sample of turf material (actual color) – without infill One (1) sample of material with infill in standard container 12" by 12" sample of tufted line – without infill

12" by 12" sample inlaid line - without infill
12" by 12" sample of proposed seaming method
12" by 12" sample edge showing backing layers
Fiber bone of each color fiber to be utilized
Five (5) pounds of proposed infill material
Five (5) pounds of base course stone material

Five (5) pounds of fine course stone material 12" by 12" of base liner material

One (1) foot sample of drainage pipe









Design and Construction Components

Design and Construction Components of Synthetic Fields

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LIFECYCLE **PLANNING**

SYNTHETIC TURF **SPORTS FIELDS**

DESIGN: Mandatory Testing

Testing is,... REQUIRED

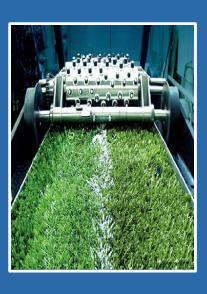


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Infilled Synthetic Turf Products:

- 1. Ball Bounce - Soccer & Baseball - ASTM F1551
- 2. Face Weight - ASTM D5848
- 3. Gmax - ASTM F355
- Grab Tear Strength Length & Width ASTM D5034 4.
- 5. Infiltration Rate - BS 7044
- 6. Machine Gauge / Stitch Rate - ASTM D5793
- 7. Pile Height - ASTM D5823
- Pill Burn ASTM D2859
- 9. Primary Backing Weight - ASTM D5848
- 10. Relative Abrasiveness - ASTM F1015
- 11.
- Seam Strength Sewn & Glued ASTM D5034 Secondary Backing Weight - ASTM D5848
- 12.
- 13. Shoe Traction Football & Soccer - ASTM F1551
- 14. Total Weight - ASTM D5848
- 15. Tuft Bind - ASTM D1335
- 16. Wheel Chair Accessibility - ASTM F1951
- Yarn Break Strength & Elongation ASTM D2256 17.
- 18. Yarn Linear Density - ASTM D1577
- 19. Yarn Melt Point - ASTM D789
- Yarn Specific Gravity ASTM D792 20.
- Yarn Thickness & Width ASTM D3218

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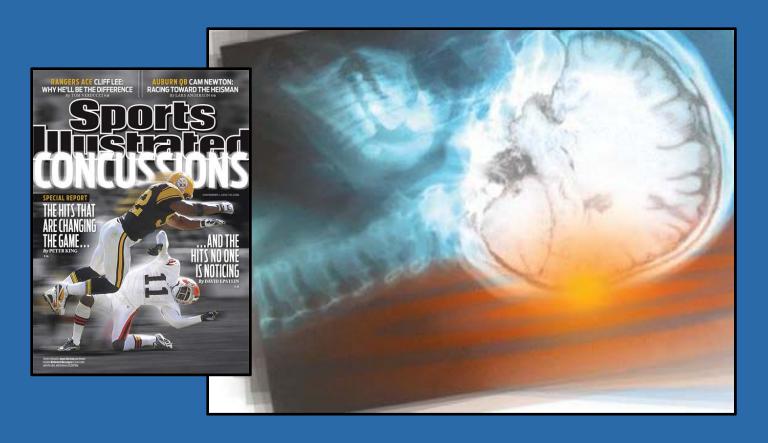
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DESIGN: Natural and Synthetic Turf



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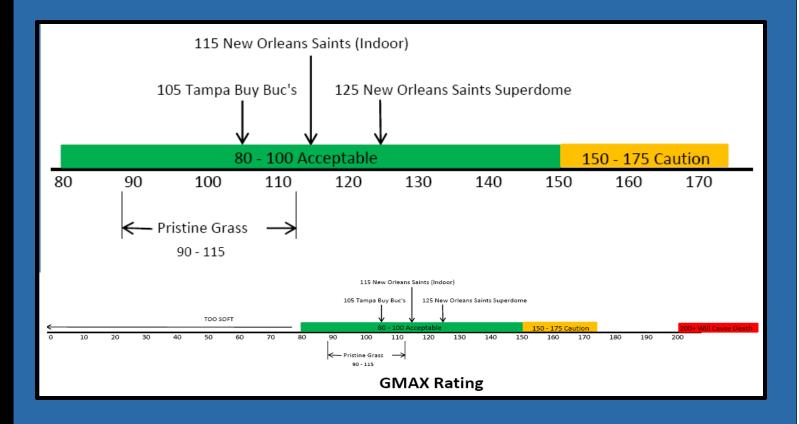
CONSTRUCTION

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DESIGN: What is Gmax



Design and Construction Components

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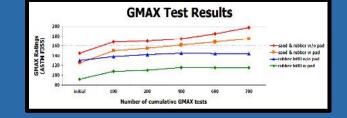
COMPLETION

MAINTENANCE

LIFECYCLE PLANNING

DESIGN: Gmax Math

Example Readings



- 60 Muddy Grass
- 80 Minimum acceptable Gmax
- 105 NFLPA TBB Field
- 115 Saints Indoor
- 125 Superdome
- 150 Acceptable Max Most Vendors
- 166 Professional Football
- 175 Acceptable Max Certain Vendors
- 180 Packed Clay
- 200 OSHA "Will Cause Death"
- 225 Frozen Grass



Design and Construction Components **Design and Construction Components of Synthetic Fields**

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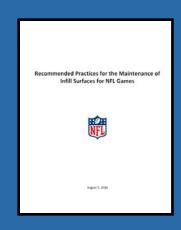
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DESIGN: Gmax Bid Requirements

The Effects:

- Past Annual Gmax Test
- Future Gmax Equipment Provided
- Gmax Covenant From Vendor



Cost Savings and
Maximum Player Safety

Design and Construction Components

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SportsTurf MANAGERS ASSOCIATION

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DESIGN: Mandatory Testing





- Must be for the entire system
- Not "just" Fiber
- Must be less than 100 PPM





Design and Construction Components

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DESIGN: Insured Warranty

An INSURED WARRANTY,... ...is "REQUIRED PROTECTION".



VENDORS WARRANTY:
The Document that
explains exactly what is
covered and what is not
covered by the warranty.



ACCORD CERTIFICATE: Outlines who is covered and during what period. It is crucial to be a named insured on this document.



INSURANCE POLICY: Outlines the insurance coverage that protects the vendors warranty and under what circumstances the coverage applies.

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DESIGN: Bonding and Insurance

What are the Bonding and Insurance Requirements for the project?

Bonding:

What are the bonding requirements? Payment and performance bonds? Lien waiver release requirements?

Insurance:

What are the Insurance Requirements? General Liability, Auto, Warranty, etc. A.M. Best rating of carriers?



Design and Construction Components

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DESIGN: Quality Assurance Program

Engage an experienced professional to manage the process Involve an experienced sports turf manager

Contractors quality assurance program Standards of installation document Geotechnical report

Surface performance and safety testing Stone check every 5 truck loads

Drainage check before surface installation Planarity check before surface installation Weight check every 5 rolls Infill sieve testing

Gmax testing upon completion
Substantial completion checklist
After sales service documentation

	OUALITY ASSURANCE PROGRAM						
1	TESTING;	Include	N/A				
	The mandatory tooting requirements are listed below. All tooting outmitted is to be conducted by independent time party techniquiabosatorius. Any vandor must dose not outmit all the nequired techniq should no longer be considered a responsible bidder for the project lighted Electronic Survey.						
4	is the FME.01 <u>Street RATING</u> It and ard Test Method for Shock-Absorbing Properties of Playing Serface Systems and Materials						
- 7	ISTM F1015-00 RELATIVE ARRASIVE INDEX. Nandard Teat Method for Relative Adrasivenass of Dynhadic Turf Playing Surfaces						
	IST THE FORTY-OF <u>JANEAUSE BIALL RESOUND HEIGHT</u> Standard Text Method for Vertical Rebound Characteristics of Sports Surface/Ball Systems, Acoustical Acoustament						
-	is the F1881-06 <u>COEFFICIENT OF RESTITUTION (CR)</u> It and ard Test Methods for Comprehensive Characterization of Synthetic Test Playing Surfaces and Malarials						
4	ks the F1851-00 <u>ANYBAGE BALL BOUNCE</u> Itandard Tast Nethots for Comprohensive Characterization of Synthetic Terf Playing Surfaces and Malariais						
-	KSTNA F1951-06 <u>SODCER SHOE TRACTION – DEY</u> Handard Teat Methods for Comprehensive Characterization of Synthetic Terf Playing Surfaces and Malariain						
4	NSTMR FREET-KD- <u>0.000 (BN 0.000 TRACTION — WET</u> Standard Test Mothods for Comprohensive Characterization of Synthetic Test Playing Surfaces and Malariais						
	ks TMR F9561-00 <u>FOOTBALL SHOE TRACTION — DRY</u> Itandard Teat Methods for Comprehensive Characterization of Synthetic Terf Playing Surfaces and Malerials						
3	us the FREET-OS <u>FOOTBALL SHOET RACTION —WET</u> Itandard Test Methods for Comprehensive Characterization of Synthesic Turf Playing Surfaces and Malerials						
4	ISTM DSN8.07 <u>TOTAL WEIGHT.</u> Itandard Tast Mathot for Mass Per Unit Avaa of Pile Yern Roor Coverings						
	Is the DSNe.017 PILE WEIGHT It and and Test Method for Mass Per Unit Area of Pile Yern Roor Coverings						
3	ASTM DGM8-07 PERMARY BACKING WEIGHT. It and and Trest Method for Mass Per Unit Area of Pile Yern Roor Coverings						
	ISTM DISNA-017 <u>3ECONDARY BACKING</u> Itandard Test Method for Mass Per Unit Area of Pile Yern Roor Coverings						
	IS THE DISIDE ONE PILE HEIGHT. It and and Track Method for Turk I night of Pile Floor Coverings						
	ISTM D1896-06 TUFT BIND STRENGTH Itandard Test Method for Tuft Bind of Pile Yam Place Coverings						
	ASTM CROSS-09 GRAIN TEAR STRENGTH Standard Test Method for Breaking Strength and Elengation of Textile Fabrics (Grain Test)						

Design and Construction Components

Design and Construction Components of Synthetic Fields

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DESIGN: Safety Assurance Program



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DESIGN: Maintenance (Service / Equipment / Training)



TOOLBOX CONTENTS 5 gallons / 19 Liters Of the recommended adhesive to perform emergency seam repair. 8 Inch (20 cm) Trowals of the recommended notch size 2 Inch (5 cm) Trowels of the recommended notch size. Adhesive syringes, for inserting adhesive under the surface without cutting the turf open. 4 \$ Inch (26 cm) 500 ml tubes Tubes of PL2000, caulking for emergency seam repair. For 500 ml tubes Caulking gun sized to use the tubes of PL2000. Recommended Hand cutting knives, to perform the repair Sized for knife Blades sized for use with the hand cutting knives. 9 Recommended Hand turf needles, for emergency sewing repairs. 10 Linear Feet Of the recommended turf thread to perform hand sewing repairs. 11 6 Inch (15 cm) Turf seaming track, to assist in adhesive transfer. 12 20 Lbs / Weighted Blocks to apply pressure to adhered repair areas. 13 Linear Feet Recommended Seaming Tape. 14 Standard Hammar 15 Galvanized 3 Inch Nails Lockable - Steel

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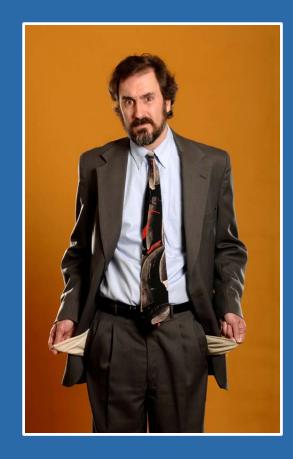
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DESIGN: Summary









Design and Construction Components

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Construction: Introduction Construction Phases

- Kick Off Meeting
- Excavation
- Perimeter Retention
- Drainage System
- Base Construction
- Synthetic Turf Installation
- Infill Placement
- Project Close Out

N/A	Complete	NSTRUCTION IGN PROFESSIONAL RESPONSIBILITIES: who will set as the conserve representation and the protectific communication
N/A	Complete	
		who will not up the owners representative and the protocol for communication
		role as part of the quality assurance program
		al and welfestian elprograss
		rafe for payment applications and processing
		the requirements as submitted by the Seneral Contractor
_		se of natice to proceed
		RTS TURF / FACILITY MANAGER RESPONSIBILITIES:
	_	noise as part of the quality assurance program
		al and welfcation eliprograms
		orkfor payment applications and processing thread of a mobilization and studing area for the project
		y and job site sufety requirements
		side of site for construction
		t maving with Seneral Centractor to discuss access requirements, utility connections and services
		aments completed and submitted as required
		documentation completed and approved by moner
		services ERAL CONTRACTOR REQUIREMENTS: unverts completed and submitted as required

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CONSTRUCTION: Construction Phases

Excavation



Perimeter



Drainage





Base Construction



Turf Installation



Infill Process

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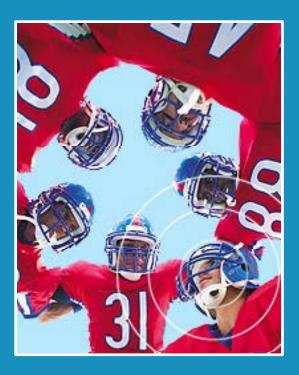
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construction: Project Team

Define Roles

- Owners Representative
- Architect
- Engineer
- Sports Turf Manager
- General Contractor
- On Site Management
- Synthetic Turf Vendor
- Business Manager



It is vital to determine who is calling the play!

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construction: Define Roles





CHESS

V.S. CHECKERS

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construction: Excavation



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construction: Perimeter Retention





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construction: Drainage









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construction: Base



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construction: Synthetic Turf



















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COMPLETION: Introduction

- Testing Requirements
- Maintenance Requirements
- Insured Warranty
- Quality Assurance
- Safety Assurance
- Financial Assurance
- Documentation

-	000						
	COMPLETION						
	COMPLETION						
	TESTING:	Complete	N/A				
	Confirm that all required testing has been completed:						
	Confirm that all of the testing documentation required has been received:						
	Varify that all tasting meets and/or exceeds the requirements:						
	QUALITY ASSURANCE:						
	Confirm that all the sequired quality assurance stages have been completed:						
	Confirm that all the quality assurance documentation required has been received:						
	Verify that all the quality assurance information provided meets and/or exceeds the requirements:						
	Review the vandor's Substantial Completion checklist:						
	dinax testing of completed synthetic terf surface, minimum 25 locations: Review the required After Sales Service documentation:						
	WARRANTY REQUIREMENTS:						
	Genfirm receipt of all the required warranty documentation:						
	Review the vendors we many documentation to ensure it meets the requirements:						
	Review the a cord certificate to ensure the owner is listed as a name densured and that the other details meet the orgalizaments:						
	Review the Insurance Providers policy documentation to ensure it meets the requirements:						
	Confirm with the Insurance Previder that the policy is in good standing and that the policy will go into affect accordingly.						
	ANNUAL MAINTENANCE:						
	Confirm receipt of any option maintenance requirements that are to be performed by the vendor MAINTENANCE TRAINING:						
	Confirm that the required maintenance training seminar for the synthetic surface has been completed. Confirm that the required maintenance egylpment training has been completed.						
	Confirm that any required maintenance equipment training has been completed: Confirm that any required maintenance equipment has been received, unpacked and inspected:						
	MAINTENANCE EQUIPMENT:						
	Wartly that all required material has been received as required:						
	Confirm that all maintenance training has been completed:						
	Confirm that any required maintanance equipment has been received, unpacked and inspected:						

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COMPLETION: Testing Requirements

Possible Testing Consideration:

Tuft Bind Requirements
Drainage Requirements
Lead and Heavy Metal Content
Gmax Requirements



Confirm that all require testing has been completed

Confirm that all the testing documentation required has been received

Verify that all testing meets and/or exceeds the requirements





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TOOLBOX CONTENTS

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COMPLETION: Maintenance Requirements

Maintenance Equipment:

- ✓ Verify that all maintenance equipment has been received, unpacked and inspected
- ✓ Confirm equipment has been properly calibrated and training has been completed
- ✓ Verify maintenance equipment literature and warranty documents have been received

Maintenance Training:

- ✓ Confirm the maintenance training seminar has been completed
- ✓ Verify that the maintenance manual and literature has been received

Future Maintenance:

✓ Verify all future maintenance events have been scheduled and confirmed







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COMPLETION: Insured Warranty



VENDORS WARRANTY:



ACORD CERTIFICATE:



INSURANCE POLICY:

An INSURED WARRANTY,...
...is "REQUIRED PROTECTION".

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COMPLETION: Quality & Safety Assurance

- ✓ Confirm that all the required quality
 assurance stages have been completed
- ✓ Confirm that all the quality assurance documentation has been received
- ✓ Verify that all the quality assurance documents meet or exceed the requirements
- **✓** Review the substantial completion checklist
- ✓ Gmax testing of completed synthetic turf, minimum 25 locations
- ✓ Review the required after sales service documentation



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COMPLETION: Financial Assurance



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COMPLETION: Documentation

Create substantial completion punch list Monetized the punch list

Issue substantial completion certificate

Obtain As-Built drawings and catalog

Obtain lien waiver releases

Obtain insured warranty certificate

Obtain other product and warranty documents

Obtain copies and review required testing

Obtain maintenance manual

Create close out binder – include all project literature

Review and approve final pay requests

Issue certificate of final completion

Release retention as provided in the contract

Release any bond requirements



COMPLETION		
SALTY ASSERBANCE	Complete	NA
Colonia de la compansa de la colonia de la c	-	
DIAM'IA ASSURANTE		
Softer that of the paper or ignification is registered to be loss completed.	-	
DOCUMENT REQUIREMENTS:	200	
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Industrial and and an extension of the contract of		
SPORTS COMPMENT	_	
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being the displacement to some street on their manufacturing formula control		
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Non-eleganite/helpanam		

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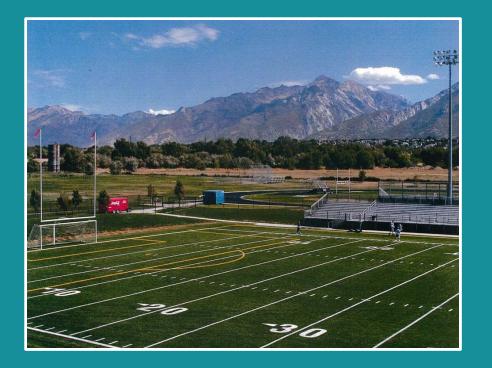
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MAINTENANCE: Program







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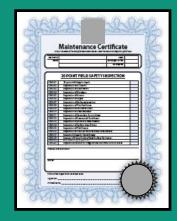
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Preservation Package	# 1	# 2	# 3	# 4	# 5	#6	#7	#8	#9	# 10
-	AHHUAL	SEMI AHHUAL	QUARTERLY	MONTHLY	COMPLETE	SINGLE GROOM	SAFETY TESTING	SCARIFICATION	SPRAY	OUTFILL
FIELD GROOMING for 1Skp Georgia Peces	1 Time	2 Times	4Tines	12Times	26 Times	1 Time				
Gmax TEST REPORT 20 Mile Dep	1 Time	2 Times	4Times	4Times	4Times		1 Time			
30 MINUTE MAINTENANCE TRAINING SEMINAR For facility Maintenance Staff	1 Time	1Time	1 Time							
MAINTENANCE EQUIPMENT INSPECTION Calbratin and Labo	1 Time	1 Time	1 Ппе							
20 POINT FIELD SAFETY INSPECTION Connecting All Apparts of the Surbar	1 Time	2 Times	4Tines	12 Times	26 Times	1 Time	1 Time			
MAINTENANCE CERTIFICATE ISSUED Authorit Certificate Decementing Service	1 Time	2 Times	41lines	12 Times	26 Times	1 Time	1 Time	1 Time	1 Tine	1 Time
GENERAL CLEAN AND MINOR STAIN REMOVAL Took Remoral and General Association of					26 Times					
24 EMERGENCY REPAIR SERVICE STWINS					52 Weeks					
FIELD INFILL SCARIFICATION Group Resting-Report - Bellow and After								1 Time		
FIELD SPRAY TREATMENT Savitary and Health Treatment									1 Time	
FIELD INFILL REMOVAL "Cleaning, mapplication and disposal am quoted superately"										1 Time



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maintenance: Equipment



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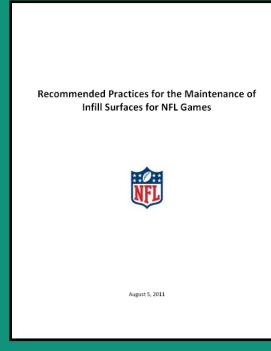
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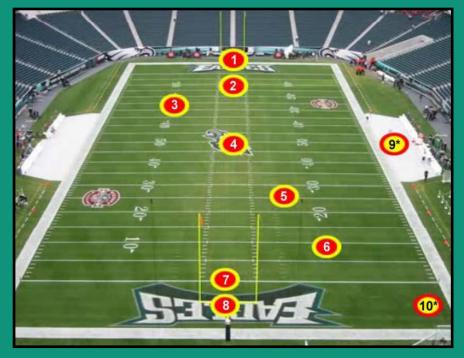
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MAINTENANCE: Safety Requirements





Risk Mitigation – Player Safety
Inspect What you Expect

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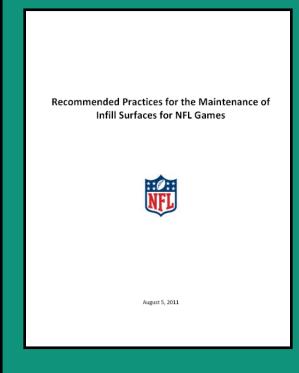
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MAINTENANCE: Safety Requirements





Infill Depth Testing:

- Ensure Safety
- Predict Replacement

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LIFECYCLE PLANNING

LIFECYCLE PLANNING: Introduction

Lifecycle and Recycling



- > Cannot Plan For Field To Last Beyond The Warranty Period
- > The Field Will Need To Be Replaced Eventually
- Financial Planning For The Eventual Replacement Is Required.
- Financial Planning For The Eventual Disposal Is Required



From the day you purchase a synthetic turf system you will need to plan for its eventual replacement and the associated disposal costs of the existing field.



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LIFECYCLE PLANNING: REQUIREMENT

- Proper Maintenance
- Routine Maintenance
- Maintenance Documentation
- Adequate Financial Planning
- Routine Safety Checks
- Risk Management Program
- Infill Management
- Warranty Requirements
- Replacement Planning

LIFE CYCLE PLANNING		
LIFE CYCLE PLANNING		
FIELD MAINTENANCE REQUIREMENTS:	Complete	N/A
Review the maintenance do cumentation for the field annually.	Comproco	1471
Complete all maintanance requirements as required by the warranty documents and suggested in the maintenance manual:		
Ensure only properly trained, qualified and experienced personnel are allowed to service the field:		
Create a calendar to ensure maintenance is performed at the proper intervals:		
MAINTENANCE EQUIPMENT:		
Only utilize approved maintenance equipment on the field:		
Routinely calibrate the maintenance equipment to ensure its proper operation:		
Create a calendar to ensure the routine inspection and replacement of brushes, bearings, etc.:		
Consult the synthetic buf manufacture with any questions and or concerns:		
SAFETY ASSURANCE:		
Perform routine safety inspections to of the field as required:		
Ensure that document is obtained for each and every safety inspection and/or testing event throughout the fields theoryte:		
Catalog all solely and besting documents throughout the entire Hocycle of the field: FINANCIAL LIFECYCLE PLANNING:		
It is necessary to sign for the fields eventual replacement		
It is financially product to paraside Lifth of the eventual replacement cost annually throughout the fields		
entire Hacycle:		
DOCUMENT REQUIREMENTS:		
Ensure that a written-document is obtained for any remediation performed on the field:		
Obtain a certificate to document each and every maintenance procedure performed:		
Obtain written avidence of all periodic safety testing performed:		
Catalog all warranty, maintenance, safety and use documents throughout the lifecycle of the field:		
SPORTS EQUIPMENT:		
Review the warranty documentation annually: Perform all required maintanance to the specific sports equipment as required by the warranty and		

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CONCLUSION:

DESIGN

Base decisions on fact,... not marketing!

Get involved in the process, don't rely on others!

Appreciate that this is a sophisticated purchase!

Educate yourself accordingly!

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THANK-YOU

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Thank You

The time you have invested in this presentation is appreciated.



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Q & A

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Question and Answer

Session



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THANK-YOU







Mark Nicholls

Markn@turfindustry.com

CELL: (905) 327-5501