

**EXECUTIVE SUMMARY
OF THE
ENGINEERING PRELIMINARY STUDY
FOR
SYNTHETIC TURF PROJECT
C-4104**

NEWPORT BEACH, CALIFORNIA

**PREPARED FOR:
CITY OF NEWPORT BEACH
HONORABLE MAYOR AND MEMBERS OF THE CITY COUNCIL
PUBLIC WORKS DEPARTMENT
3300 NEWPORT BOULEVARD
NEWPORT BEACH, CA 92663**

**PREPARED BY:
CMX, L.L.C.
7740 NORTH 16TH STREET, SUITE 100
PHOENIX, AZ 85020
(602) 567-1900**

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1.0 EXECUTIVE SUMMARY

The City of Newport Beach Recreation and Senior Services Department currently manages a number of well used, well maintained and well designed parks. These parks offer a great deal of athletic fields for the residents use throughout the year. These fields are currently inactive for several weeks each summer and winter between the currently scheduled organized leagues. The city generally uses these times to provide annual maintenance, repairs, and to make improvements to the fields so they continue to offer a high level of playability for the participants. Replacing one of these natural turf fields with synthetic turf will allow for increased usage for two reasons. Synthetic turf fields required minimal maintenance compared to natural turf fields and therefore can be used during the traditional maintenance periods. Secondly, Synthetic Turf fields recover quickly following rains and can usually be played upon within hours and not days. City staff estimates that fields are unavailable an average of ten (10) days each year during the season due to rain. These days can be recaptured and added to the available times the fields are open for use.

To reach the goal of providing subjective reasons for selecting a site, CMX rejected the approach to ranking that would have ordered the sites from one to fifteen in each category and awarding the points in that manner. We felt that it was more realistic to create categories within each criterion that awarded points to a range of data. In this manner several sites that may have had equal data, such as number of parking spaces available or annual maintenance savings, would receive equal points. This would then make the site that was truly superior to the other sites have to separate itself by exceeding the minimum or normal standards that were established by the majority of the sites. At the conclusion of the ranking the data in each category, totaling the points for each site and re-ordering the sites by score, it was evident that using this method rewarded the site that will provide the largest return on the investment.

An overall review of the ranking matrix shows four groupings of fields based on points they received. Bonita Creek Park (both configurations) with 34-35 points is seven to eight points ahead of the second place field (Lincoln Athletic Center-both configurations) and all the remaining fields. The second grouping has five fields with 21 to 28 points. There is a three point gap to the next group that includes four fields, from 18 down to 15 points, and then a gap to the final three fields, each with 13 points.

In the Development Cost column we established seven ranges and awarded points in six of the seven. It should be noted that two of the sites, Bonita Creek Park and Lincoln Athletic Center, have two separate fields planned for these sites. We have included a single field (selected by City staff as the most popular for one entry and the complete (both fields) site development alternative for a

separate entry. In addition, four of the sites were designated by City staff to include alternates to develop only part of the fields. These alternate prices have been developed for Mariners, Bob Henry, Buffalo Hills and Eastbluff Parks and would result in only the outfields being converted to the synthetic turf while leaving the infields as currently constructed and maintained. Changes to the data in the Development Cost column may also affect the Cost per Participant column. The development of both fields at the Bonita Creek Park and Lincoln Athletic Center would require a greater investment in construction dollars but these larger scale projects were only slightly behind their smaller configurations in points awarded.

The City currently supports six Organized Sports and the points were awarded in this column based entirely on the number of sports that are supported at each site. The parks that offered the highest amount of versatility received the most points. By offering points in ranges, several sites received the same points. By separating the fields at Bonita Creek and Lincoln athletic center the single field configuration was awarded less points but these fields still remained at the top of the rankings.

The presence of Sports Lights at a park is beneficial to increasing the usage should that park be selected for the conversion to synthetic turf. There are currently only four sites that have permanent sports lights and one where temporary lights are installed for specific seasons during the year. As currently weighted, the fields with lights are awarded six points, the average of the remaining categories. The remaining sites do not receive any points. This weighting was discussed and agreed to at the encouragement of the City staff who understands the importance of lighting at the parks to enhancing the programming offered.

Parking is arranged to award points for the number of available spaces, both on and off site. With sports lighting, parking is probably the second category that may deserve heavier weighting. Without parking it is difficult to increase the parks usage without negatively affecting the park users and those that live and travel near the parks. The two highest parks each had an average number of spaces available.

The City maintenance staff provided the data that has been used to calculate the annual savings that can be anticipated for each park site. These figures include the costs to maintain the athletic fields and surrounding areas, make annual repairs and improvements to the athletic fields, and pay for water usage at the park sites on an annual basis. With the conversion to synthetic turf, these costs can be eliminated or greatly reduced. Due to heavy programming and the harsh characteristics of the soils underlying the athletic fields at Bonita Creek Park the city has experienced annual expenses to keep the fields safe and playable for the

athletics. By converting to synthetic turf these annual expenses will be eliminated, as well as over 90% of the costs for weekly/monthly maintenance and annual water costs. For the purposes of this study City staff reported that 90% of the turf renovation costs at Bonita Creek Park are spent on the Football/Soccer field so this is where the majority of the costs were included in this matrix.

The Cost per Participant is an attempt to provide information that connects the costs to develop the new synthetic turf field with the anticipated number of participants that will benefit from its conversion. We have calculated the increase in the number of participants that will result in the conversion and then divided this into the Engineers Estimate of Probable Cost for that field and the result is then awarded points within the define range. This data allows another dimension to looking only at total dollars that will be required to convert the athletic fields at each site. The two top rated sites ranked in the lowest cost per participant validating their positions at the top of the rankings.

The Bonita Creek Park-Football/Soccer configuration received the top points in two categories: sports lighting (tied), and cost per participant; second place points in development cost, annual maintenance savings, and increase in participants; and third place points in organized sports and parking. By amassing 35 total points Bonita Creek Park is eight (8) points ahead of the second place park, the Lincoln Athletic Center-Football/Soccer configuration. The Bonita Creek Park-Football/Soccer configuration scored top three points in all seven of the categories. Minor changes to the weighting of some of the categories may result in a tightening of the separations between Bonita Creek and the following sites, but it is our belief that it will not result in a re-ordering of the final rankings. By recording the top three points in each category, Bonita Creek Park-Football/Soccer configuration will provide the greatest benefits to the largest number of stakeholders in this process. At second place the full configuration at Bonita Creek Park is limited only by the available amount of money that can be allocated to the conversion. If sufficient monies are available, the full conversion of Bonita Creek Park will save the most maintenance monies and provide the largest increase in annual participants for a very competitive cost per participant.

Choosing a clear favorite in the next grouping of sites/configurations is a harder task than identifying Bonita Creek Park-Football/Soccer configuration as the leading candidate for conversion. There are six sites separated by six points. The top four (including the two configurations at Lincoln Athletic Center) all have permanent sports lighting and should remain in line for future conversion as monies become available.

It is anticipated that the remaining seven sites have significant issues to overcome before they should be considered for conversion to synthetic turf.

These include a lack of sports lighting, in-sufficient parking and no flexibility in the number of sports that can be offered at these sites.

CMX Sports Engineers recommends that the City of Newport Beach proceed with the next steps in the Synthetic Turf Project, the completion of construction documents, bidding out of the documents for the selection of the lowest qualified general contractor bid and the subsequent conversion of the athletic fields at Bonita Creek Park from natural turf to synthetic turf.

2.0 SELECTION MATRIX

The underlying purpose of Phase I of the Synthetic Turf Project is to create an objective analysis of the selected park sites and their respective athletic fields with the intent to convert the athletic field(s) from natural turf to the latest generation of in-fill artificial turf. Upon the completion of the Selection Criteria Matrix discussed in Section 3.0, CMX developed the Ranking Matrix consisting of seven (7) categories. These categories are:

1. Development Cost for each Site
2. Organized Sports Offered at each Site
3. Utilities (Sports Lighting) at each Site
4. Parking available at each Site
5. Annual Maintenance Savings at each Site
6. Added Participants at each Site
7. Cost per Participant at each Site

Once we had established the main categories we developed ranking protocols with associated points in each category. A brief discussion of each follows.

Development Cost for each Site: We have created seven groups of construction costs that represent the entire range. We have provided for the least expensive fields to receive the most points (7) and have reduced the points for every \$250,000 increase above the entry category of \$500,000.

There are two sites in the study that have two (2) separate fields. These are Bonita Creek Park and Lincoln Athletic Center. For this study we have created two categories for these two parks and included them separately in the analysis. For each, the entry with the lowest costs is for the field that would be preferred by the staff, and the second entry is for building both fields at those parks

Organized Sports Offered at each Site: This category rewards each site with a point for each organized sport that is played there on the fields being considered for renovation to synthetic turf. As there are currently six (6) organized sports (adult and youth soccer, youth football, youth baseball, and adult and youth softball) taking place in the City's parks there is a maximum of 6 points available. Even though there are currently some additional organized sports such as lacrosse and rugby being played occasionally at a few parks, these sports have not reached the level where a recognized league within the City of Newport has been organized and were therefore not included.

Utilities (Sports Lighting) at each site: Points are awarded for permanent sports lighting available at the field being contemplated for the synthetic turf. Although there are temporary lights noted at Bonita Canyon Sports Park at the soccer field

being considered for renovation, the permit allowing this use is renewed annually and could be refused at any time resulting in staff recommending that no points be awarded for these lights.

Parking available at each Site: Five Points were available for parking at the sites. Quantities of available parking were a combination of on-site stalls and off-site stalls/parking. Off-site parking was counted if there were legal areas (marked by striping) on the surrounding streets that allowed parking. The off-site parking was calculated based on dividing the total length of the street frontage by 20'. The exceptions to the off-site rule are at Grant Howald Park and Buffalo Hills Park where parking on adjacent residential streets in front of homes was counted as this has always been allowed and does not result in ticketing or towing of vehicles parked on the surrounding streets.

Annual Maintenance Savings at each Site: Categories have been established in \$10,000 increments and points awarded for the estimated annual savings anticipated for the reduced maintenance and water savings. It should be noted that the anticipated savings at Bonita Creek Park are nearly double the next highest park. This is a result of the consistently salty soils present at Bonita Creek Park, as well as consistently higher programming at this park, which requires extra maintenance each year to allow for the natural turf to be maintained at the current levels.

Added Participants for each site: The additional hours for each day that the fields will be available due to the renovation to synthetic turf, as well as the additional days when field maintenance was normally performed were calculated. I have included a spreadsheet showing these calculations. Using this data it was determined that there would be a 49% increase in the times that the fields would be available following the change to synthetic turf. This percentage was applied to the annual usage numbers supplied by City staff to generate the anticipated additional number of participants at each site. The above mentioned spreadsheet includes the calculations and shows the additional participants and the anticipated total participants at each site.

Cost per Participant at each Site: Categories have been established in \$5.00 increments and points awarded for the calculated cost of the estimated synthetic turf divided by the annual number of athletic sports participants. The lower the costs per participant, the greater the number of points awarded.

The points in each of the seven categories have been totaled and then the sites have been ordered in the rank from highest to lowest. The Bonita Creek Park-Football/Soccer Field leads the list by 5-6 points over the second place site, Lincoln Athletic Center-Football/Soccer Field.

3.0 EXHIBITS

Included are the following:

1. Life Cycle Cost Analysis
2. Ranking Matrix for the Fifteen Possible Improvement Options
3. Proposed Site Plan for Bonita Creek Park

LIFE CYCLE COST ANALYSIS

ARTIFICIAL VERSUS NATURAL TURF ATHLETIC FIELDS		NATURAL GRASS				SYNTHETIC TURF			
		Existing Bonita Creek Park Site				Synthetic Turf on 1" E-Layer on Compacted Subgrade			
		Qty	Unit	Unit Cost	Amount	Qty	Unit	Unit Cost	Amount
1) Construction Costs (Initial Costs)									
Construction Costs									
Mass Excavate to Field Subgrade		-	cy	\$ 4.50	\$ -	1,500	cy	\$ 4.50	\$ 6,750
Load/Haul Spoils		-	cy	\$ 5.00	\$ -	1,500	cy	\$ 7.50	\$ 11,250
Fine Grading		-	sf	\$ 0.07	\$ -	80,100	sf	\$ 0.13	\$ 10,413
Field Drainage		-	sf	\$ 0.75	\$ -	80,100	sf	\$ 1.07	\$ 85,707
GeoTextile Fabric		-	-	\$ -	\$ -	80,100	-	\$ 0.45	\$ 36,045
E-Layer		-	-	\$ -	\$ -	80,100	sf	\$ 2.00	\$ 160,200
Field Irrigation		-	sf	\$ 0.35	\$ -	1	-	\$ 45,000.00	\$ 45,000
Syringing System		-	-	\$ -	\$ -	80,100	sf	\$ 0.18	\$ 14,418
Concrete Curbs		-	sf	\$ 0.50	\$ -	80,100	-	\$ 0.25	\$ 20,025
Artificial Turf		-	-	\$ -	\$ -	80,100	sf	\$ 5.25	\$ 420,525
Sport Striping (Initial)		-	ls	\$ -	\$ -	1	ls	\$ 2,500	\$ 2,500
90 Day Maintenance Period		-	ls	\$ 50,000	\$ -	-	-	\$ -	\$ -
Subtotal Construction Costs:					\$ -				\$ 812,833
Field Replacement/Refurbish - Year 9 ¹		-	sf	\$ 0.25	\$ -	80,100	sf	\$ 3.75	\$ 300,375
Field Replacement/Refurbish - Year 17 ¹		-	sf	\$ 0.25	\$ -	80,100	sf	\$ 3.75	\$ 300,375
Annual Field Mmaintenance		24	yr	\$ 36,750.00	\$ 882,000				
Total Construction Costs-24 Years (Three Cycles)					\$ 882,000				\$ 1,413,583
Indirect Costs:									
Contingency		10.00%			\$ 88,200	10.00%			\$ 141,358
General Conditions		5.00%			\$ 44,100	5.00%			\$ 70,679
Insurance		1.45%			\$ 12,789	1.45%			\$ 20,497
Bonds		1.15%			\$ 10,143	1.15%			\$ 16,256
Overhead & Fee		5.00%			\$ 51,862	5.00%			\$ 83,119
Subtotal Indirect Costs					\$ 207,094				\$ 331,909
Subtotal Field Construction Costs					\$ 1,089,094		Costs Per Year		\$ 1,745,492
2) Maintenance Costs									
(Calculated on 24 years-Three cycles of synthetic turf)									
2a) Labor & Materials Costs:									
Mowing/Trimming/Grooming ²		24	yrs	\$ 12,500	\$ 300,000	24	yrs	\$ 3,150	\$ 75,600
Over Seeding		24	yrs	\$ 5,000	\$ 120,000	0	yrs	\$ -	\$ -
Irrigation Maintenance		24	yrs	\$ 11,250	\$ 270,000	24	yrs	\$ -	\$ -
Fertilizer/Anti-Fungus Treatment		24	yrs	\$ 5,000	\$ 120,000	0	yrs	\$ -	\$ -
Turf Testing/Technical		24	yrs	\$ 500	\$ 12,000	24	yrs	\$ 500	\$ 12,000
Crumb Rubber Application		24	yrs	\$ -	\$ -	24	yrs	\$ 1,000	\$ 24,000
Wash Down/Vacuum Synthetic Turf		24	yrs	\$ -	\$ -	24	yrs	\$ 500	\$ 12,000
Subtotal Maintenance Costs 2a					\$ 822,000				\$ 123,600
2b) Equipment Costs (Depreciated)									
Mowing Equipment (Three Purchases)		0	ls	\$ 75,000	\$ -	0	ls	\$ -	\$ -
Edging Equipments (Three Purchases)		0	ls	\$ 1,500	\$ -	1	ls	\$ 7,500	\$ 7,500
Equipment Maintenance		0	yrs	\$ 2,500	\$ -	24	yrs	\$ 500	\$ 12,000
Small Tools/Consumables		0	yrs	\$ 500	\$ -	24	yrs	\$ 250	\$ 6,000
Subtotal Maintenance Costs 2b					\$ -				\$ 25,500
2c) Water & Fuel Consumption									
Water Consumption		24	yrs	\$ 3,500	\$ 84,000	24	yrs	\$ 250	\$ 6,000
Gasoline Consumption		0	yrs	\$ 5,000	\$ -	24	yrs	\$ 300	\$ 7,200
Subtotal Maintenance Costs 2c					\$ 84,000				\$ 44,700
Total Construction & Maintenance Costs (24 Years):					\$ 1,995,094				\$ 1,939,292
Annual # of Participants per type of field for 24 years					3,285,000				4,894,656
Cost per participant (based on 24 years of use)					\$ 0.61				\$ 0.40
NOTES:									
1	Field Replacement/Refurbishment includes complete re-sodding of natural turf field								
2	Mowing/Trimming/Grooming includes monthly grooming of synthetic turf field								

**ENGINEERING PRELIMINARY STUDY
For Synthetic Turf Project
Ranking Results**

		Development Cost		Organized Sports		Utilities		Parking				Annual Maintenance Savings		Increase in Participants		Cost per Participant		TOTALS	
		Proposed Estimate of Engineers Probable Costs	Points	# Of Sports (Soccer, Baseball, Football & Softball)(Adult & Youth)	Points	Sports Lights: Permanent(P)/Temporary(T)	Points	On-Site	Off-Site	Total Parking	Points	Annual Renovation Savings	Points	Added Participants	Points	Cost Per Participant/Projected	Points	Total Points	Ranking (1 to 15)
1	Bonita Creek Park-Football/Soccer	\$971,000	5	3	3	P	6	107	20	127	3	\$ 53,273	6	50,302	6	\$4.50	6	35	1
2	Bonita Creek ParkFootball/Soccer/Softball	\$1,909,000	1	5	5	P	6	107	20	127	3	\$ 70,158	7	67,069	7	\$9.02	5	34	2
3	Lincoln Athletic Center-Football/Soccer	\$1,156,000	4	3	3	P	6	80	0	80	2	\$ 17,296	2	40,241	5	\$6.98	5	27	3-T
4	Lincoln Athletic Center-Football/Soccer/Auxillary Field	\$1,804,000	1	5	5	P	6	80	0	80	2	\$ 27,320	3	53,655	6	\$10.89	4	27	3-T
5	Grant Howald Park & Fields	\$835,000	5	3	3	P	6	63	65	128	3	\$ 10,689	2	21,462	3	\$12.63	4	26	5
6	Arroyo Park & Field	\$1,485,000	3	4	4	P	6	51	0	51	2	\$ 27,642	3	31,299	4	\$15.37	3	25	6
7	Bonita Canyon Sports Park	\$1,073,000	4	2	2	T	0	20	204	224	5	\$ 20,797	3	49,184	5	\$7.05	5	24	7
8	Mariners Park	\$715,000	6	3	3	N	0	45+/-	30+/-	75	2	\$ 9,326	1	35,770	4	\$6.49	5	21	8
9	Bob Henry Park & Field	\$953,000	5	3	3	N	0	51	0	51	2	\$ 9,597	1	26,828	3	\$11.59	4	18	9-T
10	Buffalo Hills Park & Field	\$1,097,000	4	3	3	N	0	31	130	162	4	\$ 13,849	2	17,885	2	\$19.97	3	18	9-T
11	Coastal Peak Park & Fields	\$964,000	5	3	3	N	0	39	0	39	1	\$ 16,636	2	17,885	2	\$17.44	3	16	11
12	Sunset Ridge Park	\$1,647,000	2	2	2	N	0	72	0	72	2	\$ 21,320	3	26,828	3	\$19.96	3	15	12
13	Irvine Terrace Park & Field	\$1,149,000	4	1	1	N	0	-	60	60	2	\$ 15,032	2	17,885	2	\$20.87	2	13	13-T
14	Peninsula Park & Field	\$980,000	5	1	1	N	0	117	0	117	3	\$ 12,785	2	8,943	1	\$35.57	1	13	13-T
15	Eastbluff Park & Field	\$1,262,000	3	3	3	N	0	40	0	40	1	\$ 13,989	2	17,885	2	\$22.95	2	13	13-T

Points Range	Points	# of Sports	Points	Type	Points	# of Stalls	Points	\$ Savings/Year	Points	Increase In Participants	Points	\$ Per Participant	Points
\$0 - \$500K	7	1	1	Permanent	6	0 - 50	1	\$0 - \$10,000	1	0 - 10,000	1	\$0 - \$5.00	6
\$501K - \$750K	6	2	2	None	0	51 - 100	2	\$10,001 - \$20,000	2	10,001 - 20,000	2	\$5.01 - \$10.00	5
\$751 - \$1,000K	5	3	3			101 - 150	3	\$20,001 - \$30,000	3	20,001 - 30,000	3	\$10.01 - \$15.00	4
\$1,000K - \$1,250K	4	4	4			151 - 200	4	\$30,001 - \$40,000	4	30,001 - 40,000	4	\$15.01 - \$20.00	3
\$1,251K - \$1,500K	3	5	5			201 & Up	5	\$40,001 - \$50,000	5	40,001 - 50,000	5	\$20.01 - \$25.00	2
\$1,501K - \$1,750K	2	6	6					\$50,001 - \$60,000	6	50,001 - 60,000	6	\$25.01 & Up	1
\$1,751K - \$2,000K	1							\$60,001 & Up	7	60,001 & Up	7		



**ENGINEERING PRELIMINARY STUDY
FOR ARTIFICIAL TURF PROJECT**

EXISTING SITE AMENITIES:

1. REST ROOMS / CONCESSIONS
2. DRINKING FOUNTAINS
3. HIGH MAST SPORTS LIGHTING
4. BLEACHERS
5. DUGOUTS
6. PLAZA / HARDSCAPING
7. STORAGE
8. ON SITE PARKING, 107± SPACES
9. OFF SITE PARKING ALONG LA SALUD 300± LF, APPROXIMATELY 15 SPACES.
10. TOT LOT / PLAYGROUND
11. ADJACENT BASKETBALL
12. FOOTBALL GOAL POSTS
13. PERMANENT BACKSTOP
14. PARTIAL SIDE LINE FENCING

SPORTS PROGRAMS:

1. ADULT SOCCER
2. YOUTH SOCCER
3. ADULT SOFTBALL
4. YOUTH SOFTBALL
5. YOUTH FLAG/TOUCH FOOTBALL

PROPOSED IMPROVEMENTS:

1. APPROXIMATE TURF AREA:
 - A. 160,000 S.F.
2. SOCCER FIELD:
 - A. 60y X 115Y (180' X 345')
 - B. 40y X 80y (AYSO U10)
 - C. (8) INGROUND CORNER FLAGS
 - C. (4) NEW SOCCER GOALS
3. SOFTBALL FIELD:
 - A. 60' BASE PATHS
 - B. 46' MOUND
 - C. SKINNED INFIELD
 - D. 225' AT FOUL LINES
 - E. 250' AT CENTER FIELD
4. FOOTBALL FIELD:
 - A. 160' X 360'
5. FLAG FOOTBALL:
 - A. 40y X 100y
6. LACROSSE FIELD:
 - A. 60y X 110y

LEGEND:

1. - - - - - FOOTBALL/SOCCER
2. ————— FOOTBALL/SOCCER/
SOFTBALL

OPINION OF PROBABLE COSTS:

1. \$971,000
2. \$1,910,000

CMX Sports Engineers
 7740 N. 16TH ST. STE 100
 PHOENIX, ARIZONA 85020
 PH (602) 567-1900
 FAX (602) 567-1901

CITY OF NEWPORT BEACH
 PARKS & RECREATION
 LA SALUD & LA VIDA
BONITA CREEK PARK

CMX PROJ: 3232
 DATE: AUG 09
 SCALE: 1" = 80'
 DRAWN BY: MsB
 CHECKED BY: JP