

GREENWICH BOARD OF EDUCATION
GREENWICH PUBLIC SCHOOLS
Greenwich, CT

Board of Education Meeting Agenda Document Cover Sheet

Meeting Date: February 20, 2020

Information Only

First Read

Action Requested

Consent

Policy #:

Written

Last Reported (if applicable) MM/DD/YYYY Format:

Agenda Item Title: Central Middle School Field Options

Submitted by:

Name: Sean O'Keefe / Dan Watson

Title: Chief Operating Officer / Director of Facilities

Document Purpose/Highlights: (Max 475 Characters)

Review options including a revised option for combination synthetic / grass

Recommended Motion (if applicable): (Max 350 Characters)

Approve option X

TO: Mr. Daniel Watson
FROM: Kevin Fuselier, PLA, Associate – Milone & MacBroom, Inc.
RE: Central Middle School Athletic Fields Preliminary Design
Greenwich, Connecticut
DATE: December 11, 2019
MMI #: 5062-10-05

To date, Milone & MacBroom, Inc. (MMI) has performed extensive site investigations of the athletic fields at Central Middle School (CMS) in Greenwich, Connecticut. The investigations performed include inland wetland delineation and identification, subsurface soil explorations and identification, topographic survey, and traffic analysis. Utilizing the data gathered through these site investigations and information gathered while meeting with you and project stakeholders, MMI has developed three options for the reconstruction of the existing athletic fields at CMS. These three options are herein described in greater detail.

Existing Conditions

The existing athletic fields at CMS are located at the rear of the school campus and to the north of the school building. The large single area of play is comprised of a small youth ball field that has a skinned infield at the southeast corner, and a larger, full-size ball field that has a skinned infield at the northern limits of the site. The grass outfield area shared by both ball fields is primarily used as regulation-size fields for both soccer and lacrosse. Each ball field has a chainlink fence backstop and extended chainlink fence wings for player and spectator protection. The open field area is surrounded by woods on three sides, with the school building on the south side. The athletic fields are not illuminated or irrigated. Pedestrian and vehicular access is provided from the school parking lots located on the east and southwest sides of the property. There are little to no means for accessible travel around the field space.

Option 1 – Reconstruction of Existing Athletic Fields Utilizing Natural Grass

Option 1 proposes the removal of the existing grass fields, existing backstops, and skinned infield areas. The existing fields will be reconstructed in a similar configuration to what currently exists with new grass and skinned-infield surfaces. The only significant change to the facility layout is the proposed new location of the larger skinned-infield ball field. In Option 1, the larger ball field is proposed to be relocated to the southwest corner of the existing field space. The field would be re-orientated to have a preferred east-northeast orientation and closer proximity to the school building and field access points. While a preferred ball field orientation is achieved in Option 1, this configuration will create conflict by sharing outfield space with the small youth ball field. Under the current existing field configuration, outfield overlap is minimal.

The key improvement in Option 1 is the regrading of the site to have a consistent 1.5% slope from one end of the field to the other. Natural grass athletic fields need to have enough pitch to successfully drain water from the surface, but not so much pitch that field users would have to run up- or downhill. It is also important that the pitch is consistent for playability. Currently, the existing athletic fields have varying pitches.

Once removed, both existing topsoil and skinned-infield materials can be stockpiled on site during construction and reused for the reconstructed facility. In both instances, it is recommended that these materials be amended prior to replacement back on site. In the case of topsoil, organics and fertilizer

amendments should be added to promote healthy turf grass growth and amendments to the skinned-infield mix will improve drainage and playability.

Both existing ball fields will be fully reconstructed with regulation-size skinned infields. The youth ball field will be converted from a partial-skinned infield with a grass diamond to a fully-skinned infield, making it suitable for play for both youth baseball and softball. A new 20-foot-high chainlink backstop and 8-foot-high chainlink fence wings will be installed at a regulation distance of 25 feet from the base paths and rear of the home plate. The newly constructed full-size field will receive new 20-foot-high chainlink backstop and 8-foot-high chainlink wings that will be located 45 feet from base paths and home plates, which is a substantial improvement from the current separation of 14 feet.

We propose installing an irrigation system for the entire field area for Option 1. We believe that it is imperative to have ample irrigation for not only establishing, but more importantly maintaining a natural grass athletic field. Without proper irrigation, natural grass fields typically die off annually, even when not utilized in summer months. Without proper irrigation, a field owner can expect to reseed fields every fall and should only expect reseeding to be effective if these fields are left unused for the full fall growing season.

Additional proposed site improvements in Option 1 include a perimeter paved path that will provide an accessible route to all field areas and will also serve as a walking/jogging trail for the local community. The proposed paved path is common to all three options.

When reconstructing natural grass fields, we recommend that improvements be made to the drainage of the playing surface. There are many ways to construct a natural grass field. For this project, we propose improving the drainage of soil below the topsoil layer. A free-draining material will be placed below the topsoil layer. Over time as grass roots grow down through the topsoil layer and channels are created by organic means such as earthworm activity, the surface of the field will connect to the free-draining layer below. These channels will help water permeate through the field rather than relying on surface pitch alone to evacuate water. While the addition of a free-draining layer adds costs to the project, we believe the added costs are nominal when the desired project outcome is to create enhanced athletic fields.

Option 2 – Reconstruction of Existing Athletic Fields Utilizing Synthetic Turf

Option 2 proposes all the same improvements as described for Option 1. However, rather than the existing fields being reconstructed utilizing new grass, the entire field area will be constructed utilizing synthetic turf. The field will be configured in the same manner as in Option 1 including a youth-size ball field, a full-size ball field, and a regulation-size multipurpose field in the shared outfield.

Reconstructing the facility by fully utilizing synthetic turf has many advantages over natural grass. These advantages include the following:

All-Weather Playability

Synthetic turf can be utilized under nearly any conditions. Synthetic turf is designed to rapidly drain water from the surface so that even after the heaviest downpours, within 30 minutes the fields are free from surface water and playable. That said, even during rain events users will not damage the turf by playing on it, as they would to natural grass. When natural grass fields are used under saturated conditions, the underlying soils can become overly compact. Once soils are compacted, they not only prohibit grass root growth, they typically drain poorly and become very firm when dry. Synthetic turf can also be cleared of

snow if desirable in the winter. While we typically discourage plowing of synthetic turf fields, it can easily be done with proper equipment and skilled laborers performing the work.

Extended Playing Hours

It is recommended that natural grass fields only be used approximately 20 hours per week before they need to be rested to allow the grass to recover. Grass and the soils below take abuse when used, and too much abuse can be detrimental to the longevity of a natural grass facility. Synthetic turf, on the other hand, can be utilized from sunup to sundown. If the field is properly monitored and maintained, it will have consistent playability for the life of the field. The rule of thumb is that one synthetic turf athletic field is the equivalent to three natural grass fields. It is understood that the athletic fields at CMS will not have lighting, thus limiting the hours of use to some extent.

Warranties

Synthetic turf fields typically come with an 8-year third party pre-paid warranty. However, we are beginning to see 10-year warranties become the norm, where an 8-year third party pre-paid warranty is extended 2 years by a manufacturer's warranty. Fields can last well beyond their warranty period with proper monitoring and maintenance. Field owners must periodically inspect their fields looking for issues with inlaid lines and markings, areas of infill displacements, and foreign objects that may damage the turf. Less frequent maintenance includes dragging the field with a grooming brush to redistribute infill and running a sweeper with a magnet over the surface. A sweeper will pick up larger debris such as trash and leaves, and the magnet will pick up metals including turf spikes, jewelry, and hairpins. Annually, the turf vendor will perform a thorough inspection of the field and notify the owner of any issues with the facility. The vendor then will work hand in hand with the owner and their maintenance staff to address any additional maintenance needs in order to keep the field in prime shape through the life of the warranty and beyond.

Reduced Maintenance

Natural grass fields require twice-weekly mowing, bi-annual aeration, and seasonal overseeding, all while being irrigated as needed during the growing season. Natural grass athletic fields also require frequent line striping throughout the playing seasons. While not maintenance free as noted in the previous paragraph, there is much less maintenance required for synthetic turf fields. While a maintenance cost savings can be detailed when comparing natural versus synthetic turf, one must not forget that synthetic turf will eventually require replacement. The cost associated with the disposal of synthetic turf carpet and the replacement with a new one will easily offset the annual maintenance cost savings over a grass field.

Option 3 – Reconstruction of Existing Athletic Fields Utilizing Synthetic Turf

Option 3 calls for the elimination of the full-size ball field, reconstructing the youth ball field, and constructing a new synthetic turf multipurpose playing field. This option creates a dedicated turf multipurpose athletic field suitable for competition-level soccer and lacrosse. Ample space will be available for spectator opportunities on both sides of the playing field. A 4-foot-high chainlink fence is recommended around the perimeter of the turf surface to allow the owner to secure the field when not in use. The youth ball field will be reconstructed to improve the pitch of the field and to enhance drainage.

Option 3 is a hybrid of Options 1 and 2, and therefore the cost of this option falls in the middle of all three options. Maintenance costs will increase as there will be both natural and synthetic surfaces to

maintain. The school and Board of Education will need to evaluate the impacts to their athletic field programming to determine if the loss of one full-size ball field is acceptable.

Conclusion

Based on initial reviews, all three options are viable to meet the needs of the school and the Board of Education's needs and desires for the athletic fields at CMS. Preliminary Opinions of Probable Construction Cost have been prepared for each option and are attached hereto for consideration. Once the owner and project stakeholders have selected a preferred option or a hybrid of the options, detailed plans can be developed and project costs can be refined. A site plan review, and potentially a site plan application, will be required to be submitted to the Town of Greenwich Planning and Zoning Department prior to initiating any construction activities on site.

Attachments

5062-10-05-d11119-memo



Central Middle School
Athletic Fields - Option 1 All Grass Reconstruction
Greenwich, Connecticut

December 2019
MMI No. 5058-10-05
By: Kevin Fuselier, PLA

PRELIMINARY DESIGN OPINION OF PROBABLE CONSTRUCTION COSTS

Engineer's Opinion of Construction Costs based upon Concept Design Plan **Option 1**, Dated: December 10, 2019

No. Item	Unit	Quantity	Unit Cost	Cost
1. Construction Site Preparation and Maintenance				
a. Mobilization	LS	1	\$50,000	\$50,000
b. Construction Staking	LS	1	\$5,000	\$5,000
c. Construction Fencing	LF	600	\$10	\$6,000
2. Temporary Construction Facilities				
a. Sediment Control Fence	LF	1200	\$4	\$4,800
b. Inlet Protection	EA	2	\$250	\$500
c. Construction Access Roads	LS	1	\$5,000	\$5,000
3. Removals				
a. Existing Backstops & Foundations	EA	2	\$5,000	\$10,000
b. Miscellaneous Removals	LS	1	\$5,000	\$5,000
4. Earthwork and Grading				
a. Strip Existing Turf	SY	19000	\$2	\$28,500
b. Strip & Stockpile Topsoil	SY	19000	\$1	\$23,750
c. Strip & Stockpile Infield Material	SY	3750	\$2	\$7,500
d. Mass Earthwork	CY	7500	\$12	\$90,000
e. Import and Place Specialized Fill	CY	6750	\$35	\$236,250
f. Laser Grading	SY	22800	\$2	\$34,200
g. Sod Lawn	SY	19000	\$8	\$152,000
h. Supplement and Form Skinned Infields	CY	200	\$200	\$40,000
4. Drainage System Improvements				
a. Allowance	LS	1	\$15,000	\$15,000
5. Site Amenities				
a. Install Irrigation System	SF	170000	\$1	\$85,000
b. Bituminous Concrete Walks	SY	1200	\$35	\$42,000
c. Chain Link Backstops and Fencing	LS	1	\$50,000	\$50,000
d. Bases	EA	2	\$1,000	\$2,000

Subtotal =	\$892,500
+15% Contingency	\$133,875
	\$1,026,375

Notes and Assumptions:

1. Detailed design, permitting, and construction administration costs not included.



PRELIMINARY DESIGN OPINION OF PROBABLE CONSTRUCTION COSTS

Engineer's Opinion of Construction Costs based upon Concept Design Plan **Option 2**, Dated: December 10, 2019

No. Item	Unit	Quantity	Unit Cost	Cost
1. Construction Site Preparation and Maintenance				
a. Mobilization	LS	1	\$50,000	\$50,000
b. Construction Staking	LS	1	\$5,000	\$5,000
c. Construction Fencing	LF	600	\$10	\$6,000
2. Temporary Construction Facilities				
a. Sediment Control Fence	LF	1200	\$4	\$4,800
b. Inlet Protection	EA	2	\$250	\$500
c. Construction Access Roads	LS	1	\$5,000	\$5,000
3. Removals				
a. Existing Backstops & Foundations	EA	2	\$5,000	\$10,000
b. Miscellaneous Removals	LS	1	\$5,000	\$5,000
4. Earthwork and Grading				
a. Strip Existing Turf	SY	19000	\$2	\$28,500
b. Strip & Remove Topsoil	SY	19000	\$5	\$95,000
c. Strip & Remove Infield Material	SY	3750	\$5	\$18,750
d. Mass Earthwork	CY	260	\$12	\$3,120
e. Import and Place General Fill	CY	1250	\$35	\$43,750
f. Formation of Subgrade	SY	19150	\$2	\$28,725
5. Field Subsurface Drainage System Improvements				
a. Collector Pipe	LF	1,600	\$30	\$48,000
b. Composite Flat Drains	LF	5,600	\$5	\$28,000
c. Outlet Pipe	LF	100	\$40	\$4,000
d. Storm Manholes	EA	2	\$5,000	\$10,000
e. Area Drains	EA	2	\$3,000	\$6,000
c. Dynamic Stone Base	CY	4,300	\$80	\$344,000
d. Geotextile Fabric	SY	19,500	\$5	\$97,500
6. Synthetic Turf System				
a. Turf & Infill (Envirofill, Permeant Lines, Grooming Equipment)	SF	176,400	\$7	\$1,146,600
b. Shock Pad	SF	176,400	\$2	\$264,600
7. Site Amenities				
a. Concrete Turf Anchor Curb	LF	1610	\$35	\$56,350
b. Portable Pitcher's Mound	LS	1	\$15,000	\$15,000
c. Bituminous Concrete Walks	SY	1200	\$35	\$42,000
d. Chain Link Backstops and Fencing	LS	1	\$50,000	\$50,000

e. Turf Vaults (Comm./Irrigation)	EA	4	\$1,500	\$6,000
f. Portable Bases	EA	2	\$1,000	\$2,000
8. Site Restoration				
a. Allowance	LS	1	\$15,000	\$15,000
			Subtotal =	\$2,439,195
			+15% Contingency	\$365,879
				\$2,805,074

Notes and Assumptions:

1. Detailed design, permitting, and construction administration costs not included.



Central Middle School
Athletic Fields - Option 3 New Synthetic Field
& Clay/Grass Ball Field Reconstruction
Greenwich, Connecticut

December 2019
MMI No. 5058-10-05
By: Kevin Fuselier, PLA

PRELIMINARY DESIGN OPINION OF PROBABLE CONSTRUCTION COSTS

Engineer's Opinion of Construction Costs based upon Concept Design Plan **Option 3**, Dated: December 10, 2019

No. Item	Unit	Quantity	Unit Cost	Cost
1. Construction Site Preparation and Maintenance				
a. Mobilization	LS	1	\$50,000	\$50,000
b. Construction Staking	LS	1	\$5,000	\$5,000
c. Construction Fencing	LF	600	\$10	\$6,000
2. Temporary Construction Facilities				
a. Sediment Control Fence	LF	1200	\$4	\$4,800
b. Inlet Protection	EA	2	\$250	\$500
c. Construction Access Roads	LS	1	\$5,000	\$5,000
3. Removals				
a. Existing Backstops & Foundations	EA	2	\$5,000	\$10,000
b. Miscellaneous Removals	LS	1	\$5,000	\$5,000
4. Earthwork and Grading				
a. Strip Existing Turf	SY	19000	\$2	\$28,500
b. Strip & Remove Topsoil	CY	1500	\$25	\$37,500
c. Strip & Stockpile Topsoil	CY	1000	\$5	\$5,000
d. Strip & Remove Infield Material	SY	3750	\$5	\$18,750
e. Strip & Stockpile Infield Material	SY	1350	\$5	\$6,750
f. Mass Earthwork	CY	260	\$12	\$3,120
g. Import and Place General Fill	CY	1250	\$35	\$43,750
h. Formation of Subgrade	SY	19150	\$2	\$28,725
i. Laser Grade Topsoil	SY	12200	\$2	\$18,300
h. Supplement and Form Skinned Infield	CY	75	\$200	\$15,000
5. Field Subsurface Drainage System Improvements				
a. Collector Pipe	LF	1,150	\$30	\$34,500
b. Composite Flat Drains	LF	2,600	\$5	\$13,000
c. Outlet Pipe	LF	100	\$40	\$4,000
d. Storm Manholes	EA	2	\$5,000	\$10,000
e. Area Drains	EA	2	\$3,000	\$6,000
c. Dynamic Stone Base	CY	1,900	\$80	\$152,000
d. Geotextile Fabric	SY	8,600	\$5	\$43,000
6. Synthetic Turf System				
a. Turf & Infill (Envirofill, Permanent Lines, Grooming Equipment)	SF	77,500	\$7	\$503,750
b. Shock Pad	SF	77,500	\$2	\$116,250

7. Site Amenities

a. Concrete Turf Anchor Curb	LF	1150	\$35	\$40,250
b. 4' Ht' Perimeter Fencing & Gates (Turf Field)	LF	1150	\$60	\$69,000
c. Bituminous Concrete Walks	SY	1400	\$35	\$49,000
d. Concrete Bleacher Pads	SY	410	\$90	\$36,900
e. Chain Link Backstops and Fencing	LS	1	\$25,000	\$25,000
f. Turf Vaults (Comm./Irrigation)	EA	4	\$1,500	\$6,000
g. Bases	EA	1	\$1,000	\$1,000
h. Install Irrigation System				

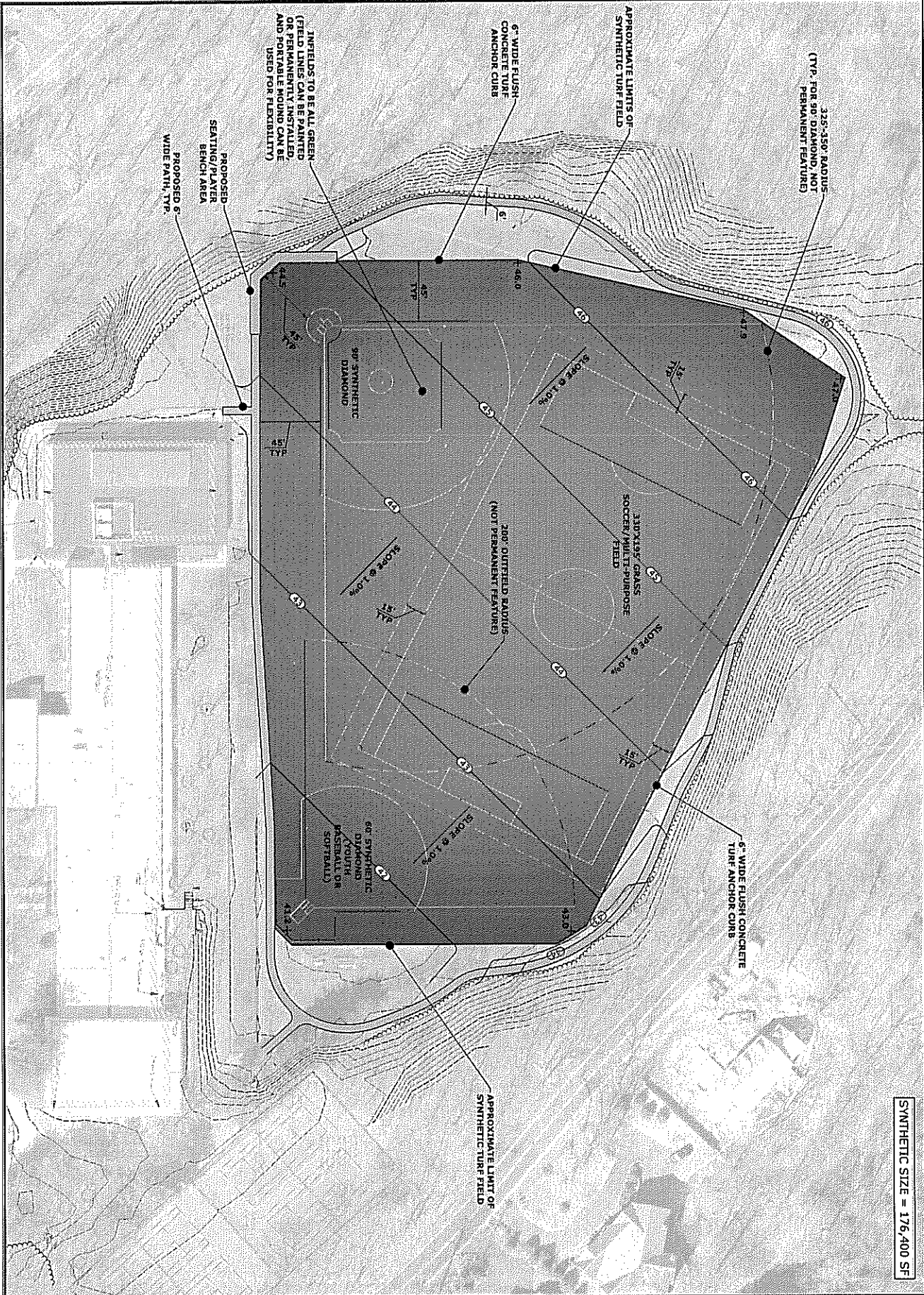
8. Site Restoration

a. Allowance	LS	1	\$15,000	\$15,000
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Subtotal =	\$1,416,345
+15% Contingency	\$212,452
	\$1,628,797

Notes and Assumptions:

1. Detailed design, permitting, and construction administration costs not included.



OPTION 2
 CENTRAL MIDDLE SCHOOL
 ATHLETIC FIELDS
 8 INDIAN ROCK LANE
 GREENWICH, CONNECTICUT

NO.	DATE	BY	DESCRIPTION

DATE: 12/16/2013
 TIME: 2:07:3

MILONE & MACBROOM
 15 HULLY ROAD
 GREENWICH, CT 06039
 (203) 659-1111
 WWW.MMAG.COM



OP-2



Central Middle School
Athletic Fields - Option 4 New Synthetic Field
& Clay/Grass Ball Field Reconstruction
Greenwich, Connecticut

February 2020
MMI No. 5058-10-05
By: Kevin Fuselier, PLA

PRELIMINARY DESIGN OPINION OF PROBABLE CONSTRUCTION COSTS

Engineer's Opinion of Construction Costs based upon Concept Design Plan **Option 4 "New Turf Concept"**, Dated: 1/29/20

No. Item	Unit	Quantity	Unit Cost	Cost
1. Construction Site Preparation and Maintenance				
a. Mobilization	LS	1	\$65,000	\$65,000
b. Construction Staking	LS	1	\$5,000	\$5,000
c. Construction Fencing	LF	600	\$10	\$6,000
2. Temporary Construction Facilities				
a. Sediment Control Fence	LF	1200	\$4	\$4,800
b. Inlet Protection	EA	4	\$250	\$1,000
c. Construction Access Roads	LS	1	\$5,000	\$5,000
3. Removals				
a. Existing Backstops & Foundations	EA	2	\$5,000	\$10,000
b. Miscellaneous Removals	LS	1	\$5,000	\$5,000
4. Earthwork and Grading				
a. Strip Existing Turf	SY	22,500	\$2	\$33,750
b. Strip & Remove Topsoil	CY	1,600	\$35	\$56,000
c. Strip & Stockpile Topsoil	CY	2,000	\$8	\$16,000
d. Strip & Remove Infield Material	SY	1,350	\$5	\$6,750
e. Strip & Stockpile Infield Material	SY	3,750	\$5	\$18,750
f. Mass Earthwork	CY	1,000	\$12	\$12,000
g. Import and Place General Fill	CY	2,000	\$35	\$70,000
h. Formation of Subgrade	SY	22,500	\$2	\$33,750
i. Spread Stockpiled Topsoil	SY	13,335	\$3	\$40,005
j. Laser Grade Topsoil	SY	13,335	\$2	\$26,670
k. Turf Establishment	SY	13,335	\$3	\$40,005
l. Skinned Infield	CY	75	\$200	\$15,000
5. Field Subsurface Drainage System Improvements				
a. Collector Pipe	LF	1,150	\$30	\$34,500
b. Composite Flat Drains	LF	2,600	\$5	\$13,000
c. Outlet Pipe	LF	100	\$40	\$4,000
d. Storm Manholes	EA	4	\$5,000	\$20,000
e. Area Drains	EA	4	\$3,000	\$12,000
f. Dynamic Stone Base	CY	2,100	\$80	\$168,000
g. Geotextile Fabric	SY	9,345	\$5	\$46,725
6. Synthetic Turf System				
a. Turf & Infill (Envirofill, Permanent Lines, Grooming Equipment)	SF	84,500	\$7	\$549,250

b. Shock Pad	SF	84,000	\$2	\$126,000
7. Site Amenities				
a. Concrete Turf Anchor Curb	LF	1,150	\$35	\$40,250
b. 4' Ht' Fencing & Gates (Turf Field)	LF	850	\$60	\$51,000
c. Retaining Wall	FF	200	\$50	\$10,000
d. Chain Link Backstops and Fencing	LS	2	\$25,000	\$50,000
e. Turf Vaults (Comm./Irrigation)	EA	4	\$1,500	\$6,000
f. Bases	EA	2	\$1,500	\$3,000
g. Install Irrigation System	LS	1	\$85,000	\$85,000
h. Ball Safety Netting	LF	150	\$150	\$22,500
i. Foul Poles	EA	4	\$6,000	\$24,000
j. Empty Conduits (2)	LF	900	\$22	\$19,800
8. Site Restoration				
a. Allowance	LS	1	\$15,000	\$15,000

	Subtotal =	\$1,770,505
	+ (+/-)15% Contingency	\$265,576
<i>Construction Cost with Contingency Subtotal</i>		\$2,036,081
	+ (+/-)8% Design, Engineering & CA	\$162,886
Grand Total		\$2,265,000

This budget is an engineer's opinion of the probable construction costs for the project as outlined by the conceptual site layout plan. Costs are based on projects in similar scope and is intended for preliminary budgeting purposes only. Detailed design, site investigation and project programming are necessary to further refine the budget. Final construction costs will be determined by actual bidding of the work to qualified contractors.

