All Sports Facility Feasibility Study

Department of Recreation, Parks and Cultural Activities

Earth Tech, Inc.
675 North Washington Street, Suite 300
Alexandria, Virginia 22314
(703) 549-8728

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1. Overview

1a. Project History

The City of Alexandria has determined the need for a state-of-the-art lighted multi-use sports complex to provide an appropriate venue for high school athletics, including night football as well as other competitive and recreational sporting events such as field hockey, soccer, track & field and lacrosse. At the direction of the City Council, the Department of Recreation, Parks & Cultural Activities (RP&CA) initiated efforts to identify several city-owned sites for consideration. This effort was carried out together with a locally formed group of interested citizens - Alexandrians for an All City Sports Facility (AACSF).

The efforts carried out by RP&CA and AACSF resulted in a report identifying a preferred site from a list of four possible sites for the sports complex. The report also provides a list of required program elements. The four sites considered in the report are listed below and are identified on the location map in Figure 1:

Site A – Hensley Park Site
Site B – Roth/Witter Site
C – Potomac Yard/Simpson Fields
D – Four Mile Run Park

The report prepared by AACSF illustrates possible layouts for each site and tabulates advantages and disadvantages unique to each site for evaluation purposes. Some of the criteria considered included: multi-modal access, neighborhood impacts, space limitations, parking, and environmental issues.

Upon completion of the conceptual analysis, the City report recommended Site A, the Hensley Park site, as the preferred location for the sports complex. AACSF then advocated for a more detailed analysis of the preferred site to evaluate constructibility and costs, and the validation of the recommendation.

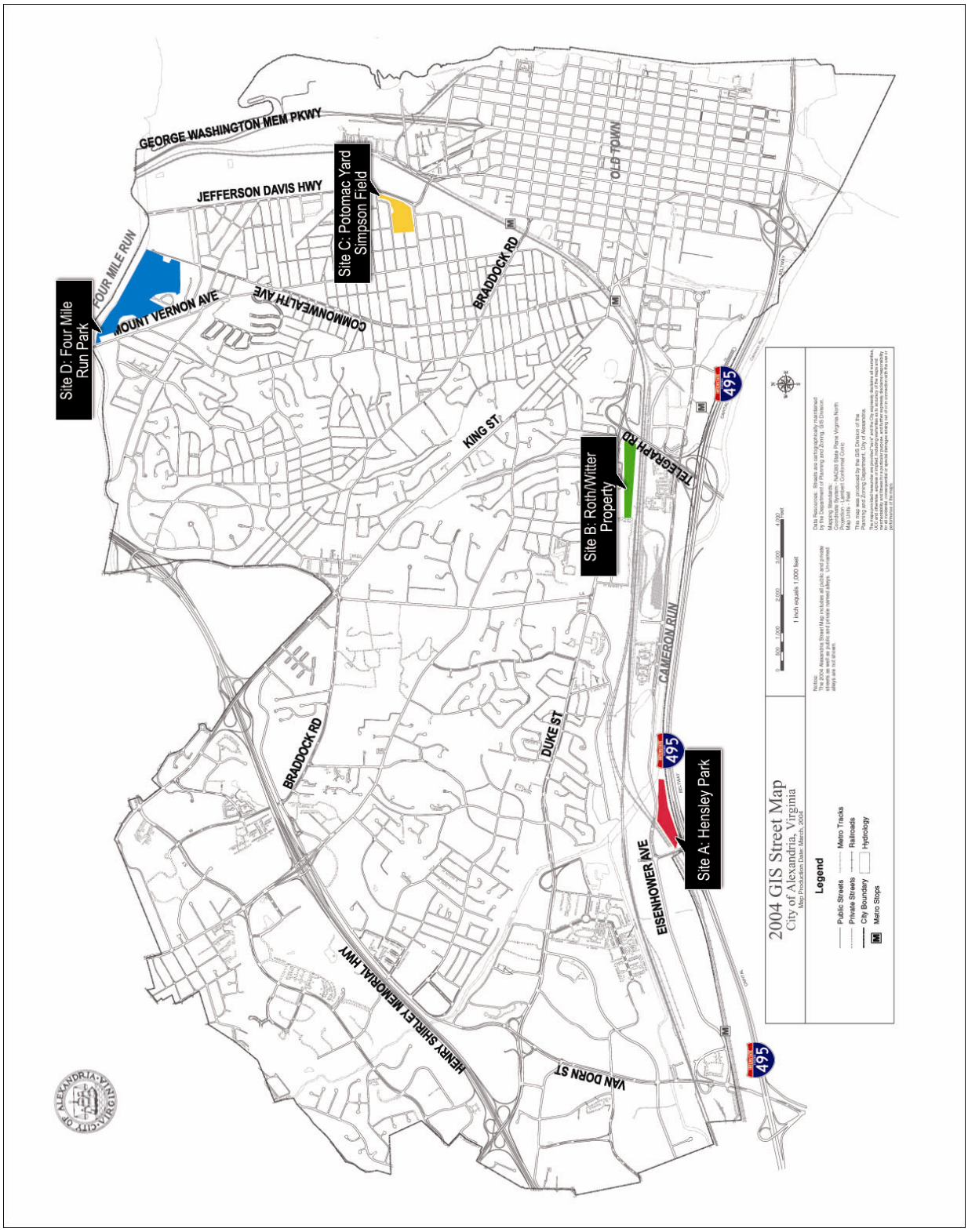


Figure 1. All-City Sports Facility Location Map

1b. Feasibility Study

As a result of the report and conceptual analysis, RP&CA retained Earth Tech, Inc. to perform an engineering feasibility study of the preferred site layout. As part of the feasibility study the following tasks were to be investigated:

Review and validate the analysis completed in the conceptual report prepared by RP&CA and AACSF.

- Develop alternative layout schemes for the Hensley site in regards to physical, programmatic, and geographical characteristics of the All Sports Facility. In addition, evaluate and determine whether the Hensley site should reasonably accommodate the inclusion of an indoor roller rink consisting of 14,000 SF.
- Perform a geotechnical and environmental review of the Hensley site to determine possible impacts on construction, schedule, and costs.
- Perform a transportation analysis of the site including pedestrian, transit, and vehicle access. Evaluate parking constraints and availability for the complex.
- Develop a project cost estimate that includes engineering and construction.

2. Site Selection Review and Validation

Earth Tech has reviewed the study report, titled '**All City Sports Facility**', prepared by Alexandrians for All City Sports Facility (AACSF), and has visited all four sites that were studied to validate the preliminary site analysis outlined in AACSF's report.

The major program elements for the multi-use sports complex include:

- One (1) 360' x 225' multi-use field for football, soccer, field hockey / lacrosse.
- One (1) 6-lane, 400 meter competitive track
- Two (2) 30' x 133' bleachers – total 4000 seats capacity
- Two (2) 60' x 60' men and women locker rooms
- Two (2) 15' x 45' men and women restrooms.
- One (1) 20' x 40' concession area.
- Surface parking for 100 – 200 cars.

Earth Tech's review results are summarized as follows:

2a. Hensley Park – Site 'A'

The Joseph Hensley Park is a 12.40-acre City Park with existing sports facilities located at the Southern edge of the City (See Figure 2). The park is bounded by Eisenhower Avenue and WMATA and CSX Railroad right-of-way to the north, Clermont Avenue to the west, the Capital Beltway to the south and Cameron Run Creek to the east. The park is one of the largest sports facilities in the City, with a lighted soccer field, and three lighted ball fields. The Park's amenities include a restrooms/storage building, picnic pavilion, public telephone, on-site parking (approximately 80 spaces), and a separate park entrance and exit from Eisenhower Avenue. A major Fairfax County storm sewer runs through the site.

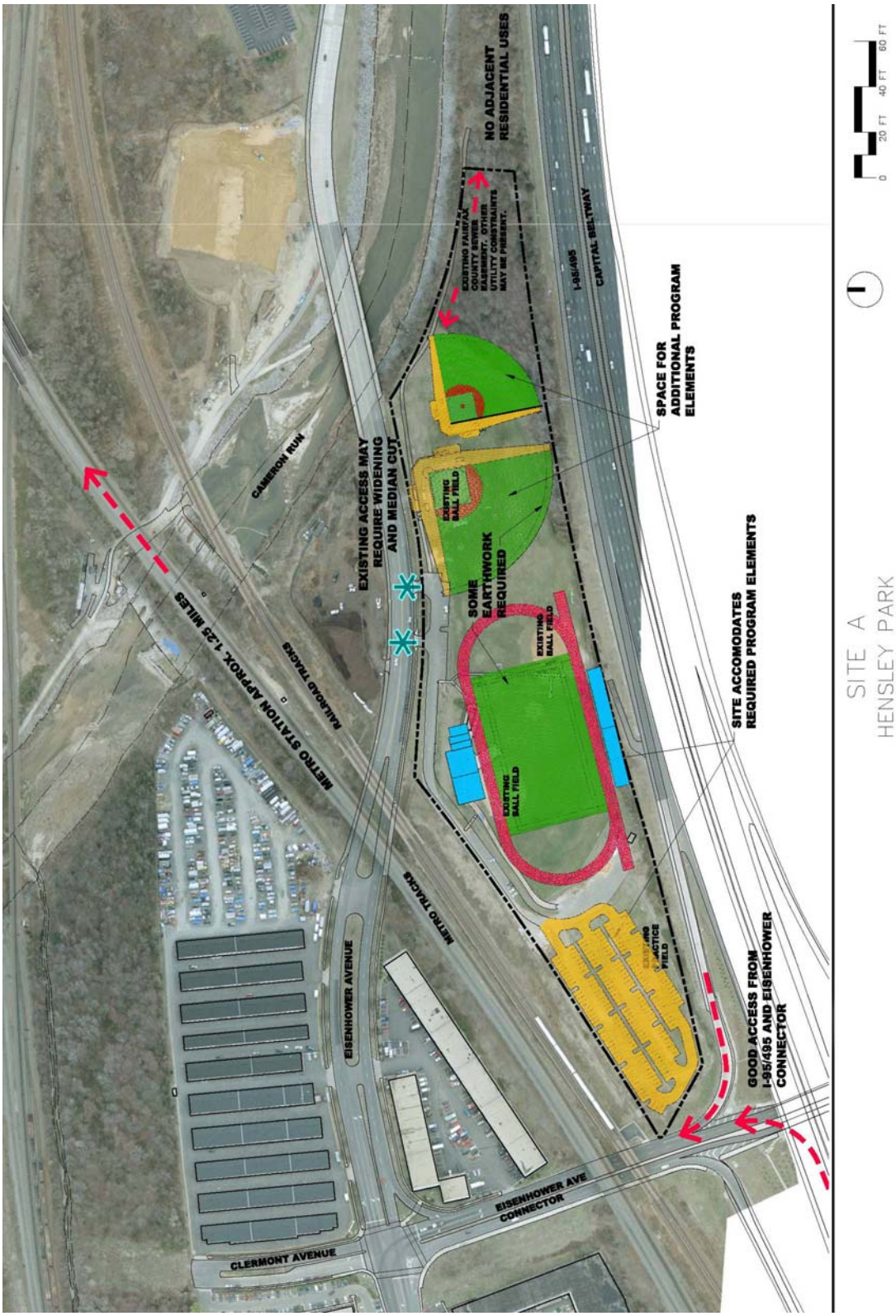


Figure 2. Site A – Hensley Park

The existing sports facilities occupy approximately 90% of the total site. Only a small wooded area at the east end of the park between Cameron Run Creek and the Capital Beltway is still undeveloped. The present ball fields were built on three different tiers. The existing soccer field on the western end of the park is situated on the highest level of the site, approximately 5 feet above the adjacent tier, where a ball field, restroom and picnic pavilion are situated. The remaining two ball fields are located on the lowest level, approximately 18 feet below the middle tier. The steep drop in elevation between these two tiers is stabilized by a paved step retaining wall serving as a bleacher and landscape vegetation.

Advantages
Hensley Park is ideal for an all sports complex because of its acreage and location. This site has adequate acreage to accommodate every element of the required multi-use field, a baseball field and softball field (or two softball fields), with room for expansion. If an indoor roller rink is determined to be one of the desired program elements to be included, it may be feasible to build an overhead structure above the main parking lot to accommodate it. Utilities are readily available for the new development. The site is located in an open area with adequate buffer from the nearest residential and commercial establishments. Traffic, noise and light pollution should therefore not be a major issue for local citizens. The site can be conveniently accessed by automobiles, Metrorail, buses, bicycles, and pedestrians.

Disadvantages
In order to accommodate the program elements, all of the existing athletic fields and amenities will have to be demolished and rebuilt. Major earthwork, including cut and fill and retaining walls may be required. An underground petroleum pipeline runs along the west edge of the site next to the existing railroad tracks. Furthermore, either a pedestrian crossing signal or sidewalk extension along the south side of Eisenhower Avenue will be needed to allow safe pedestrian crossing. The rectangular field will have a less than optimal east-northeast orientation. Major event parking can not be entirely accommodated on-site because of limited space, and off-site parking resources must be identified.

2b. Roth/Witter Property – Site 'B'

The Roth/Witter Property (approximately 13.2 acres) is located in an open space at the Southwest corner of the Duke Street and Telegraph Road intersection (See Figure 3). Bounded by Witter Drive to the north, Telegraph Road to the east, WMATA and railroad right-of-way to the south, and an industrial complex to the west.

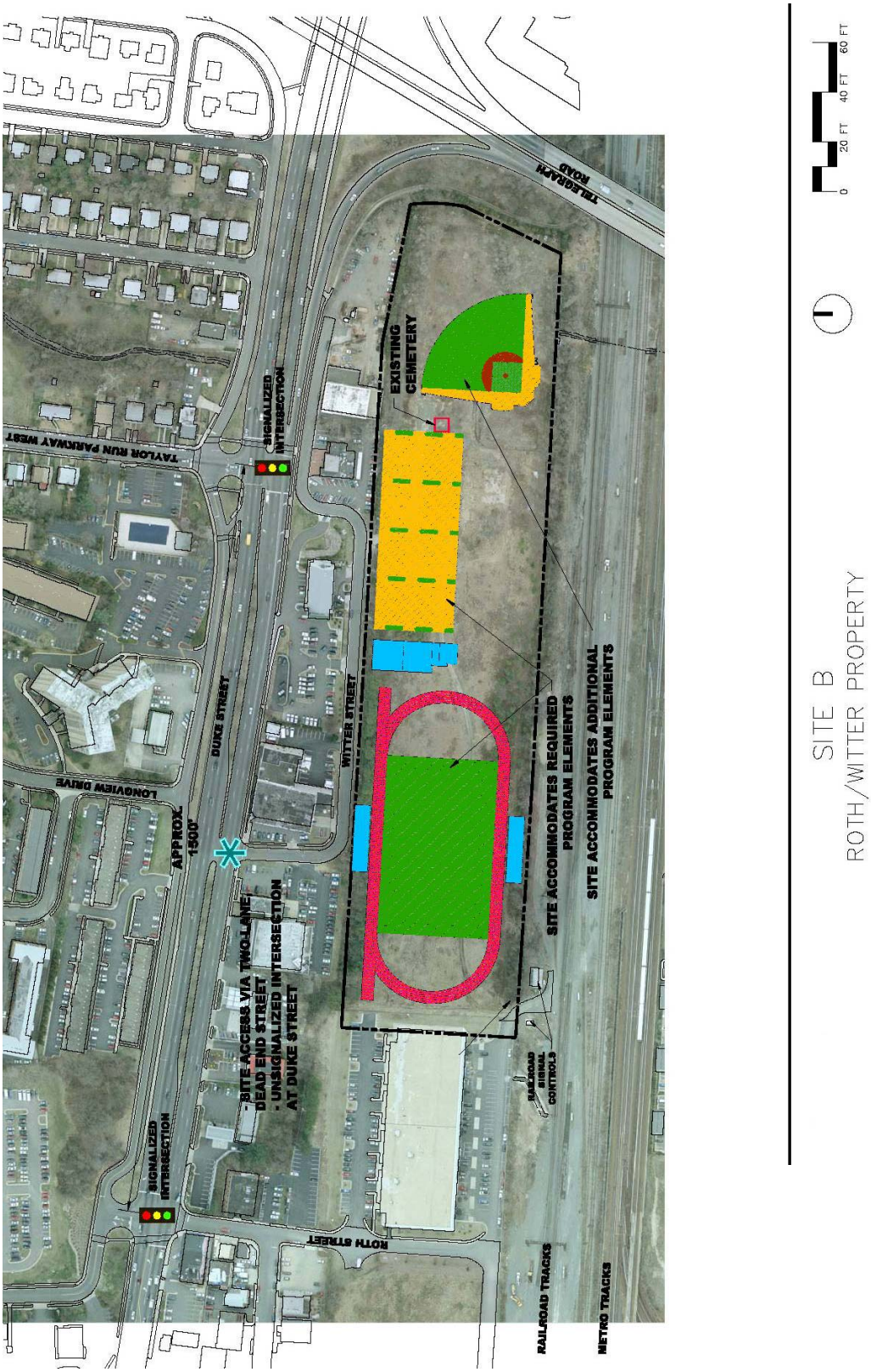


Figure 3. Site B – Roth/Witter Property

The site is a large, flat, undeveloped area. The site contains a small private cemetery and a parking lot used for car-dealer off-lot storage. Access to the site is via Duke Street at Witter Drive, an unsignalized intersection. An underground petroleum pipeline runs along the south edge of the site next to the existing railroad tracks and just outside the property boundary.

Advantages
The Roth/Witter Property has sufficient size to accommodate all elements of the required multi-use field, and a ball field. Similar to Hensley Park, it may be feasible to add an indoor roller rink / multi-use facility above the main parking lot, if determined to one of the desired program elements. Grading will be minimal. Since the site is located in a commercial area, Witter Drive traffic, noise and light pollution should not be a conflict with the surrounding residents. The site can be accessed by Metrobus on nearby Duke Street.

Disadvantages
Witter Drive is a two-lane street serving small business establishments including an animal hospital. A traffic signal at the Witter/Duke Street intersection may be needed to accommodate the increased traffic volume generated by large events, such as Friday night football. Witter Drive may need to be widened and the sidewalk should be extended to the park entrance.

For large events, accessibility is not as favorable for this alternative as for the Hensley Park Site, since the Roth/Witter Property does not have frontage along a major arterial (although Duke Street is one block North). The rectangular field and track complex will have a sub-optimal east-west orientation. The planned program for this site is based upon the Woodrow Wilson Bridge mitigation for the revision to the urban deck area. Any change in the program would require review and approval by the federal government.

2c. Potomac Yard/Simpson Fields – Site 'C'

Simpson Stadium Park is a 13.70-acre City park in the Del Ray neighborhood located at the Northwest corner of the Jefferson Davis Highway and Monroe Avenue intersection (See Figure 4). The site is bounded by U.S. Route 1 and Potomac Yard to the east, a residential area to the north, a YMCA facility to the west, and a grocery store to the south.

Potomac Yard/Simpson Fields is fully developed with two lighted baseball fields, lighted tennis courts and basketball courts, fenced canine park, storage/ restroom facilities, and small on-site parking lots. Soccer fields are located in Potomac Yard on the Eastside of U.S. Route 1. The adjacent YMCA parking lot and the Simpson Fields lot are used to accommodate overflow parking for existing venues. This site serves a range of active and passive recreation needs for residents of the Del Ray and North Old Town neighborhoods and Citywide league sports play.

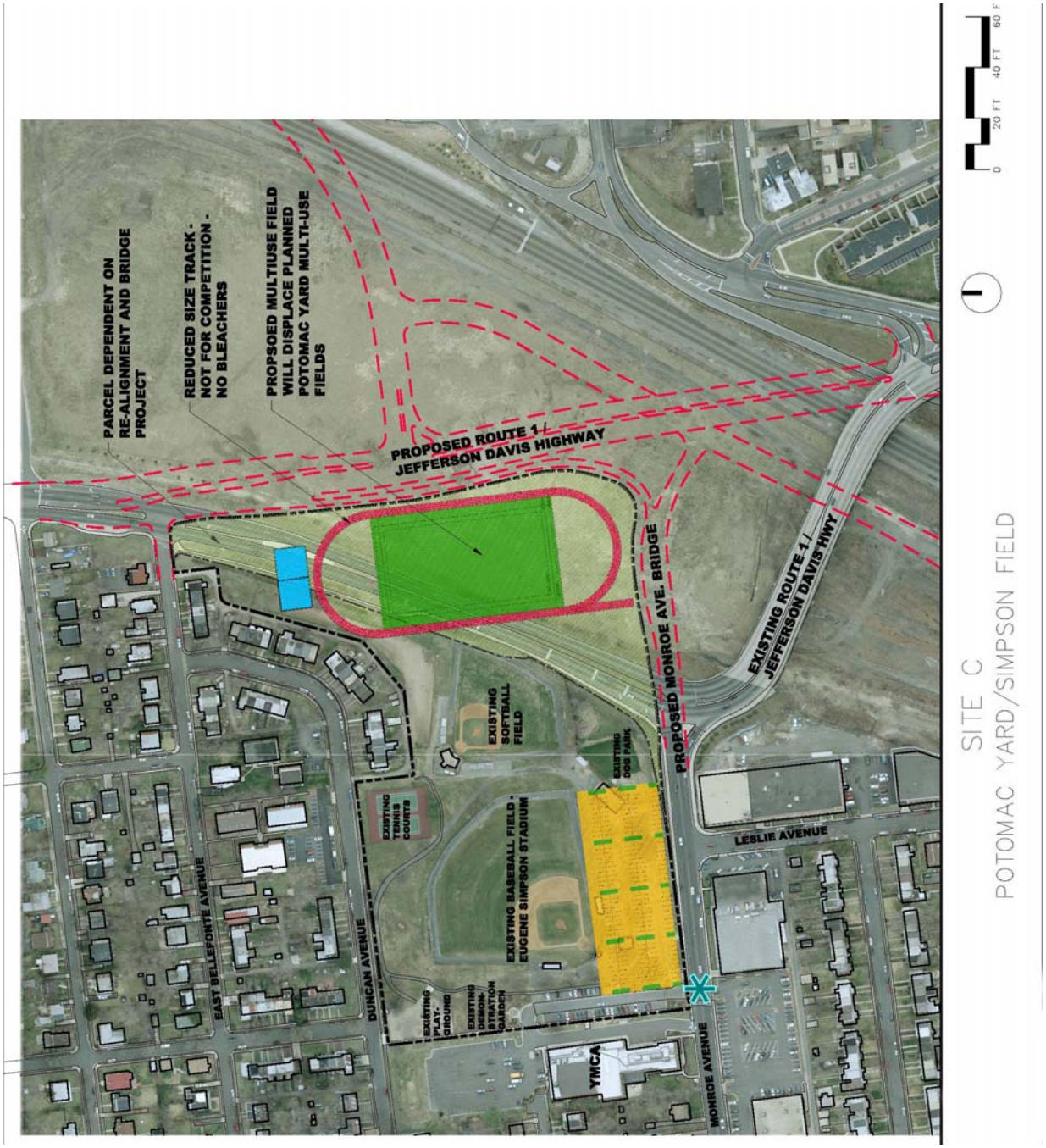


Figure 4. Site C – Potomac Yards/Simpson Field

The proposed site for the All City Sports facility would be created by combining portions of the existing Simpson Field with land made available by the planned realignment of Route 1. The land will be made directly accessible to Simpson Field as part of the Monroe Avenue bridge realignment and Potomac Yard development projects. A site of approximately 5 acres in size will remain between the smaller Simpson baseball field and realigned Route 1 for the purposes of the All Sports Facility complex.

Advantages
Grading will be minimal. The existing ball fields and tennis courts will not be disturbed. However, additional parking spaces can be achieved by relocating the existing basketball court to an area north of the baseball field. Utilities are available on-site. Orientation of the major rectangular field would be good, roughly north-northwest.

Disadvantages
In spite of the proposed Monroe Avenue Bridge realignment, only a fraction of the required elements for the All Sports Facility can be constructed on this site. Running tracks will be limited to 4 lanes instead of the desired 6-lanes. The all-purpose field will not have bleachers due to lack of available space. Parking will be limited, even though overflow parking is allowed in the adjacent YMCA parking lot. Large event noise, light spillage and street parking will likely be a significant concern to local residents. The proposed improvements hinge on the realignment of the Monroe Avenue Bridge.

2d. Four Mile Run Park – Site 'D'

Four Mile Run Park is a 55.90-acre City park that covers an extensive area of athletic fields, wetlands, and Four Mile Run shoreline from Jefferson Davis Highway to Mount Vernon Avenue (See Figure 5). The park is a fairly flat and contains two lighted, fully fenced, ball fields and an unlit, unfenced secondary ball field as well as a lit soccer field. The park is located at the northern edge of the city amid mixed-use developments consisting of Cora Kelly Elementary School, apartment and townhouse complexes, and commercial/industrial establishments. The park is bounded by the Four Mile Run to the north, Commonwealth Avenue to the east, and Mount Vernon Avenue to the south and west. Four Mile Run Park can be accessed from Commonwealth Avenue and a bicycle trail running through the park between Mount Vernon and Commonwealth Avenues. A small paved area between the two existing ball fields provides on-site parking spaces for the park.

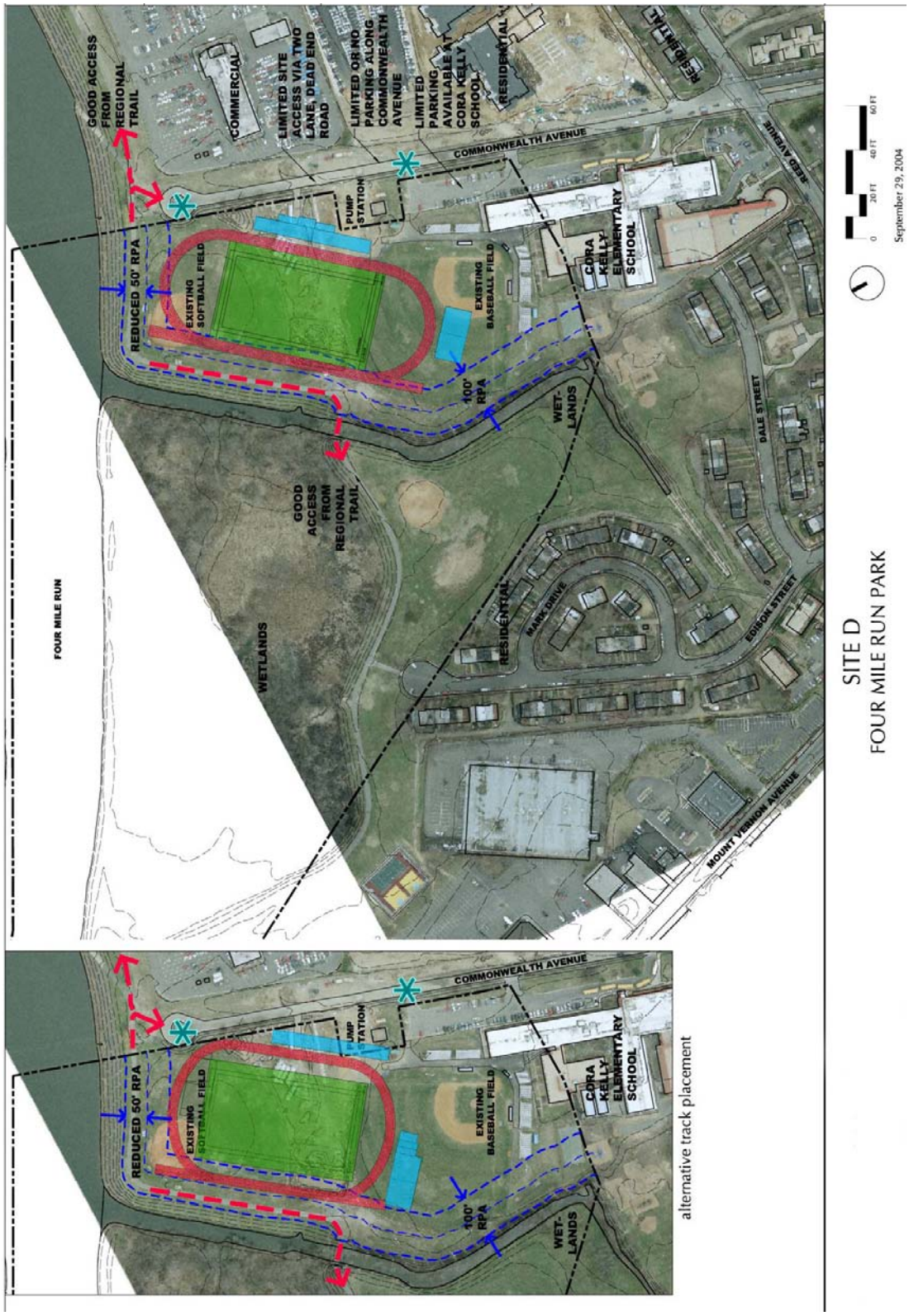


Figure 5. Site D – Four Mile Run Park

Additional limited parking is available off-site at the adjacent Cora Kelly School parking lot.

Advantages
Grading will be minimal as the site is fairly flat. Utilities are in close proximity. A multi-purpose trail, Metro, and dash bus services are available nearby.

Disadvantages
Four Mile Run Park, although large in acreage, has limited useable space due to an existing wetland and a 100-foot Resource Protection Area (RPA) rule designated in the Chesapeake Bay Ordinance. The only sizeable space that is available for the proposed development is within the same footprint of the two existing ball fields. Under the 100-foot RPA buffer zone restriction, only a multi-purpose field (without bleachers and running tracks), concession stand, restrooms and locker rooms can squeeze in this space. Only if an RPA reduction of 50 feet is granted (an unlikely event, as the City has just approved recent Chesapeake Bay Ordinance updates), can a full multi-purpose field with a 6-lane running track and bleachers be built.

Construction of a multi-purpose field on this site will eliminate both ball fields, as well as the existing parking. This will eliminate all on-site parking spaces, leaving available only street parking and the adjacent school parking lot. Large event traffic and parking on Commonwealth Avenue, crowd noise and increased field lighting will likely be viewed as a major disruption by the local citizens and surrounding neighborhood.

In terms of access to the site, Commonwealth Avenue dead-ends at Four Mile Run, so ingress and egress would be severely limited. In addition, access to the site and adjacent school is through established residential neighborhoods.

2e. Site Selection Conclusion

Program Elements

Both the Hensley Park and Roth/Witter Property sites can adequately accommodate all the program elements defined in the report prepared by the City and AACSF, except for a surface-level roller skating rink, without resorting to structured parking. At the Potomac Yard site, the track would be limited to 4 lanes and would not accommodate the full straight track section, due to space limitations on the north side. In addition, there is not enough room for the bleachers at the multi-purpose field. Similarly, the Four Mile Run park site is limited by space and RPA boundaries. The following elements would not be accommodated on that site: half of the stadium

bleachers, concession facilities, and the competition-size track (if RPA boundaries cannot be reduced by 50 feet).

Two of the sites have existing city recreational facilities that would be displaced as result of the proposed redevelopment. Hensley Park currently has three ball fields and one soccer field; the new sports facility would eliminate one or two ball fields. At Four Mile Run Park, two of the existing ball fields would be eliminated in order to accommodate the multi-purpose field and track. The Roth/Witter Property is programmed per the WWB mitigation for the urban deck, and therefore would be impacted as well. The Potomac Yard site would keep the two existing ball fields and add the multi-purpose field on land recovered from the relocation of Monroe Avenue Bridge, but would displace the planned second multi-use field.

At two of the sites, additional athletic fields can be accommodated beyond the program elements set out by AACSF. At Hensley Park, there is enough room to reconstruct two softball fields. As mentioned above, the site currently contains three ball fields. The Potomac Yard site already has two baseball fields in place that should remain intact, provided that the relocation of the Monroe Avenue Bridge moves forward as planned. Four Mile Run Park does not have adequate space for construction of a new ball field. The existing site has a baseball field and softball field that will be removed if a multi-purpose field is installed. At the far northwest end of the park, there is an existing soccer field. A considerable portion of the Four Mile Run Park is designated as wetlands.

For consideration of an indoor roller rink, Hensley Park has enough space to accommodate it, if other program elements, like a ball field or parking lot, are eliminated. The preferred option for this site would be to provide an elevated structure above the proposed parking lot in order to maximize space and keep all program elements. However, this option would likely increase costs. At the Roth/Witter site, there is some space to accommodate other program elements, such as a roller rink, but the configuration is limited by a cemetery on the east side of the site. For the same reasons as mentioned above, the Potomac Yard site and Four Mile Run Park have space constraints that would preclude the addition of a roller rink.

Field orientation is an important program element because glare can create visibility issues for athletes, depending on the sun's position in the sky. Ideally, the best orientation for a field would be in a north-south direction in order to reduce the possibility of morning or evening glare for one side of the field. Neither Hensley Park nor Roth/Witter would provide an optimal orientation as both sites would provide the track and multi-use field in a slightly north and east-west alignment. At both the Potomac Yard site and the Four Mile Run Park, a north-south orientation would be assumed, so the field position would be ideal, with respect to glare.

Access and Circulation

In terms of regional accessibility, the Hensley Park site is the most ideal location, due to its close proximity to the Capital Beltway interchange with the Eisenhower Connector, as well as the direct access off Eisenhower Avenue, a major collector in the City. The site at the Roth/Witter properties is not as accessible for large event traffic, with no direct access to a major interstate or limited-access road. At the Potomac Yard site, the east boundary would be the Jefferson Davis Highway, but no direct access would be feasible. The only access point would be via the intersection of Monroe Avenue at the YMCA parking entrance. The closest limited-access roadway, George Washington Parkway, would be accessed via Monroe Avenue and Slaters Lane. Finally, the Four Mile Run Park site does not have good access potential, since it is framed on two sides by water. The roadway network surrounding the site is mainly low-speed residential in nature. The closest arterial, Glebe Road, is south of the site and would serve as the most direct route to Interstate 395, to the west.

All sites will require mitigating improvements to the surrounding street system in order to efficiently handle the traffic generated by large events at the site. This may include upgrades to improve traffic flow in the vicinity of the proposed sites. Expansion of Potomac Yard is hinged upon Monroe Avenue Bridge re-alignment, along with any timing issues that may arise from the construction schedule. In order to accommodate the maximum capacity associated with all the program elements (specifically, the proposed stadium) at the Roth/Witter property, Witter Road may need to be improved.

Access to public transportation (via bus or Metro) is within close proximity of all sites. The access points to all sites are off of roadways that are on a designated bus route, and/or Metro stops are within reasonable distance via a short bus ride or walk. Likewise, local pedestrian/bicycle trails are close by or border the properties of each site. In particular, the Four Mile Run site has direct access to a regional trail running through the park.

Land Use

Two land use criteria that were examined for the validation process were impacts on adjacent land uses and the potential for joint-use of facilities. The Hensley Park site is situated in an area that is less sensitive to noise, lighting, parking overflow, etc, and compliments the land use at Cameron Run Park on the other side of Eisenhower Avenue. Due to the industrial / commercial nature of the site at the Roth/Witter Property, impacts to adjacent property may be minimal. The sites at Potomac Yards and Four Mile Run Park are very similar in that some of the adjacent land is residential, which would mean sensitivity to lighting, noise, parking overflow, etc. However, both of the locations are also adjacent to existing recreational facilities with high joint-use potential (YMCA , Simpson Field, tennis courts at Potomac Yard site and Cora Kelly Elementary School, existing fields at Four Mile Run Park).

Environment

The single greatest environmental screening criterion is the potential impact to the Chesapeake Bay requirements, in terms of encroachment on RPA boundaries and residual run-off. The Hensley Park site sits adjacent to Cameron Run, which feeds the Potomac River; the Roth/Witter and Potomac Yard sites are not located near bodies of water; at the Four Mile Run site, the proposed program elements would require variances to the RPA boundary.

Adequate drainage is another potential constraint that was examined for all sites. The Hensley Park site is sloped and oriented such that stormwater runoff and flooding are not expected to be a concern. The Four Mile Run park site is situated such that the adjacent Four Mile Run or small creek running north-south on the property could create stormwater run-off problems in periods of heavy rain.

Development

For two of the sites, Hensley Park, and Four Mile Run Park, development of the site property is not constrained by an agreement with other property owners. On the other hand, feasibility of development for the Potomac Yard site is entirely dependent on the relocation of existing Monroe Avenue Bridge, allowing the recovered land area to become available to the City. The realignment project is subject to approval by VDOT. The Roth/Witter site is part of the WWB mitigation and any changes would require federal review and approval.

Utilities would be required for the Roth/Witter Property. Potable water and sanitary sewer hookups must be established. The existing facilities at Hensley Park, Potomac Yard / Simpson Field and Four Mile Run Park provide for these connections already.

The existing topography of the Hensley Park site will require substantial modifications in order to provide level ground for the program elements being considered. The current ball field layout is arranged on three tiered levels. Future uses will necessitate earthwork and some retaining walls. At the Roth/Witter property site, the topography is more conducive to the proposed layout for the various land use elements, but earth work will be required. The Potomac Yard and Four Mile Run Park sites will not require substantial grading improvements.

The final criterion considered in the validation process was availability of existing amenities, such as restrooms, parking, etc. No adequate facilities are usable at the Roth Witter property. The Potomac Yard, Hensley Park, Four Mile Run sites have restroom facilities and limited parking, but both will need to be supplemented if the additional sports field improvements are to occur.

Conclusion

Three of the sites have issues that could preclude them from being viable options for the proposed All-City Sports Facility. The Roth/Witter property site is constrained by the existing cemetery located on the property. In addition, federal approval would be required for any program change to this site. The Potomac Yard site is wholly dependent on the Monroe Avenue Bridge realignment. The Four Mile Run Park site requires a Resource Protection Area variance in order to gain adequate acreage for the program elements specified by AACSF and the City.

Traffic issues, such as access and circulation issues are constraints for all three sites as well. Access would be confined to local roads that may be incapable of handling peak traffic volumes associated with major events at the proposed All-City Sports Facility. The residential areas adjacent to the Potomac Yard and Four Mile Run Park sites will likely be a problem in terms of additional traffic, parking, noise and light impacts that would be anticipated.

Based on these factors, the Hensley Park site is the most suitable site for multi-use All City Sports Facility. The site has the most usable space available to accommodate all program elements, in addition to the extra amenities requested, and has the fewest impacts to nearby parcels. The potential for higher costs associated with demolition, earthwork, or retaining structures are out-weighed by the suitability of the site for meeting all the program requirements with the least impacts and no contingencies.

3. Alternative Development for the Preferred Site

Upon completion of the site review and validation process, several potential configuration alternatives were developed for the preferred site at Hensley Park. An aerial view of the site, as it exists today, is shown in Figure 7, on the following page. Each scheme was designed to accommodate program elements that are in addition to, or slightly modified from, the original requirements set forth by the AACSF. Additional consultation with the City of Alexandria resulted in the requests to determine if the following program elements could be included:

- 1 90' Baseball Field
- 1 Softball / Youth Baseball Field
- 14,000 square-foot Indoor Roller Rink / Multi-Use Space
- 400 meter track with 8 lanes (original called for 6 lanes)

The additional program elements will have a significant impact on on-site parking. Therefore, the schemes examined were configured to provide varying degrees of balance between the need for additional sports facilities and the need for corresponding parking. The four schemes that were derived as part of this study are listed below, and are described in detail on the following pages.

Scheme A - 2 Softball / Youth Baseball Fields and 193 Paved Parking Spaces (and 90 Grass Spaces)

- 2 Softball / Youth Baseball Fields with seating for 150 people each (one field will be primary, for ball games only, while the secondary field will serve as overflow parking during stadium events)
- Main parking lot with 184 spaces, with the option to build an elevated Indoor Roller Rink / Multi-Use Space overhead
- Auxiliary parking lot with 9 spaces, plus up to 90 grass spaces

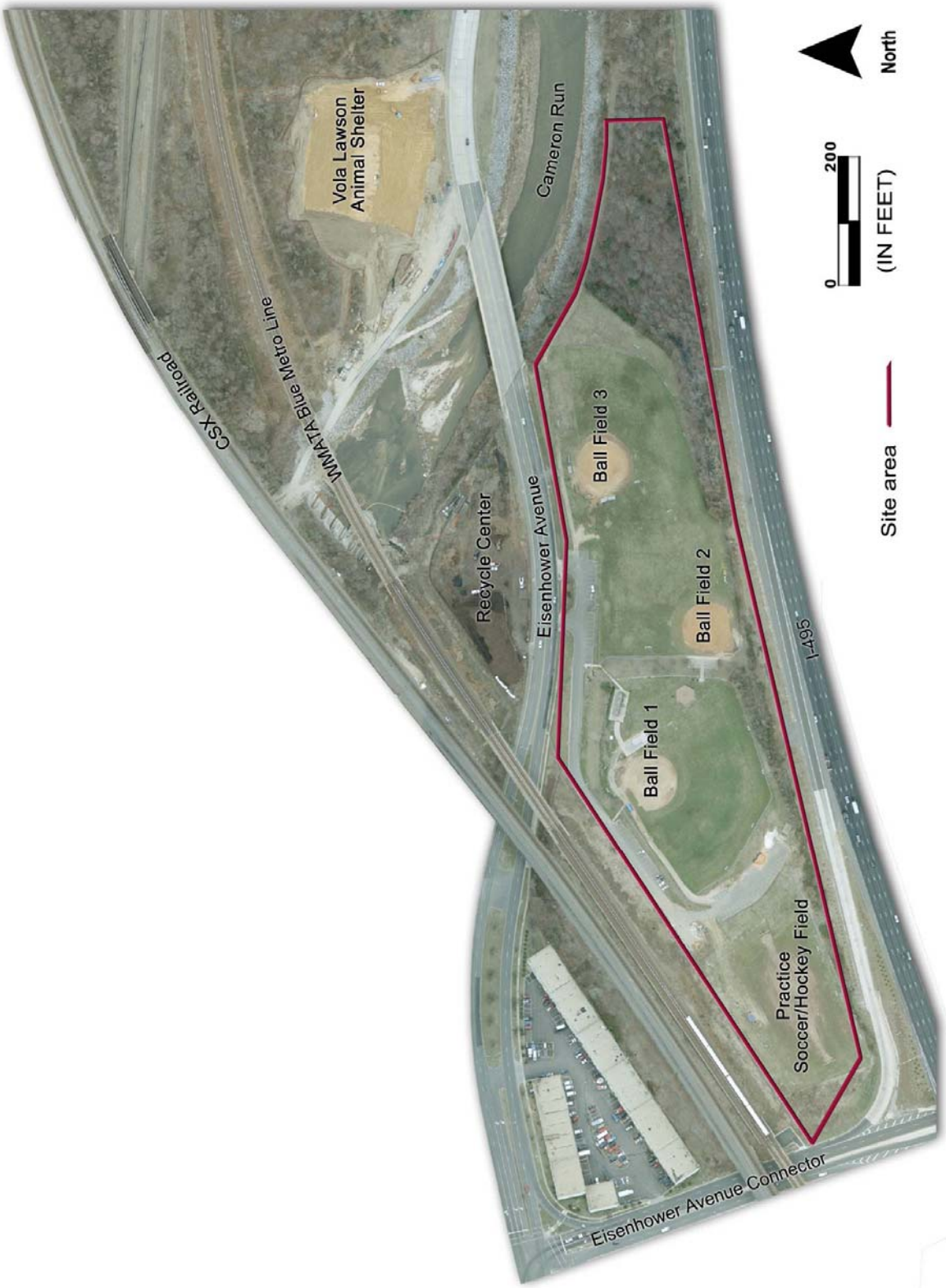


Figure 7. Hensley Park – Existing Aerial View

Scheme B - One 90' Baseball Field and 224 Paved Parking Spaces

- 190' Baseball Field with seating for 165
- Main parking lot with 152 spaces, with the option to build an elevated Indoor Roller Rink / Multi-Use Space overhead
- Auxiliary parking lot with 72 spaces

Scheme C - One 90' Baseball Field and One Softball / Youth Baseball Field and 103 Paved Parking Spaces

- 190' Baseball Field with seating for 165
- 1 Softball / Youth Baseball Field with seating for 165
- Main parking lot with 86 spaces (no roller rink option)
- Auxiliary parking lot with 17 spaces

Scheme D - No Ball Fields and 472 Paved Parking Spaces

- Main parking lot with 285 spaces, with the option to build an elevated Indoor Roller Rink / Multi-Use Space overhead
- Auxiliary parking lot with 187 spaces

An assessment of the feasibility for constructing a 14,000-sq. ft. indoor roller rink / multi-use space showed that for Schemes A, B, and D, the cost of this element would increase costs. Due to the topography and space limitations of the site under these three alternatives, the footprint of the proposed building could not be accommodated as a ground-level facility. Therefore, the structure would have to be constructed such that it was elevated above the main parking lot on the west side of the site. From an engineering standpoint, the concept is feasible, but construction costs would increase substantially for the program elements. One possibility would be to design the main parking lot such that the indoor roller rink/multi-use space could be added at a later time, when additional funding becomes available. Due to the reduced space available for parking, provision of an indoor roller rink / multi-use space would not be feasible under Scheme C.

All schemes were configured to ensure that the issues below were addressed:

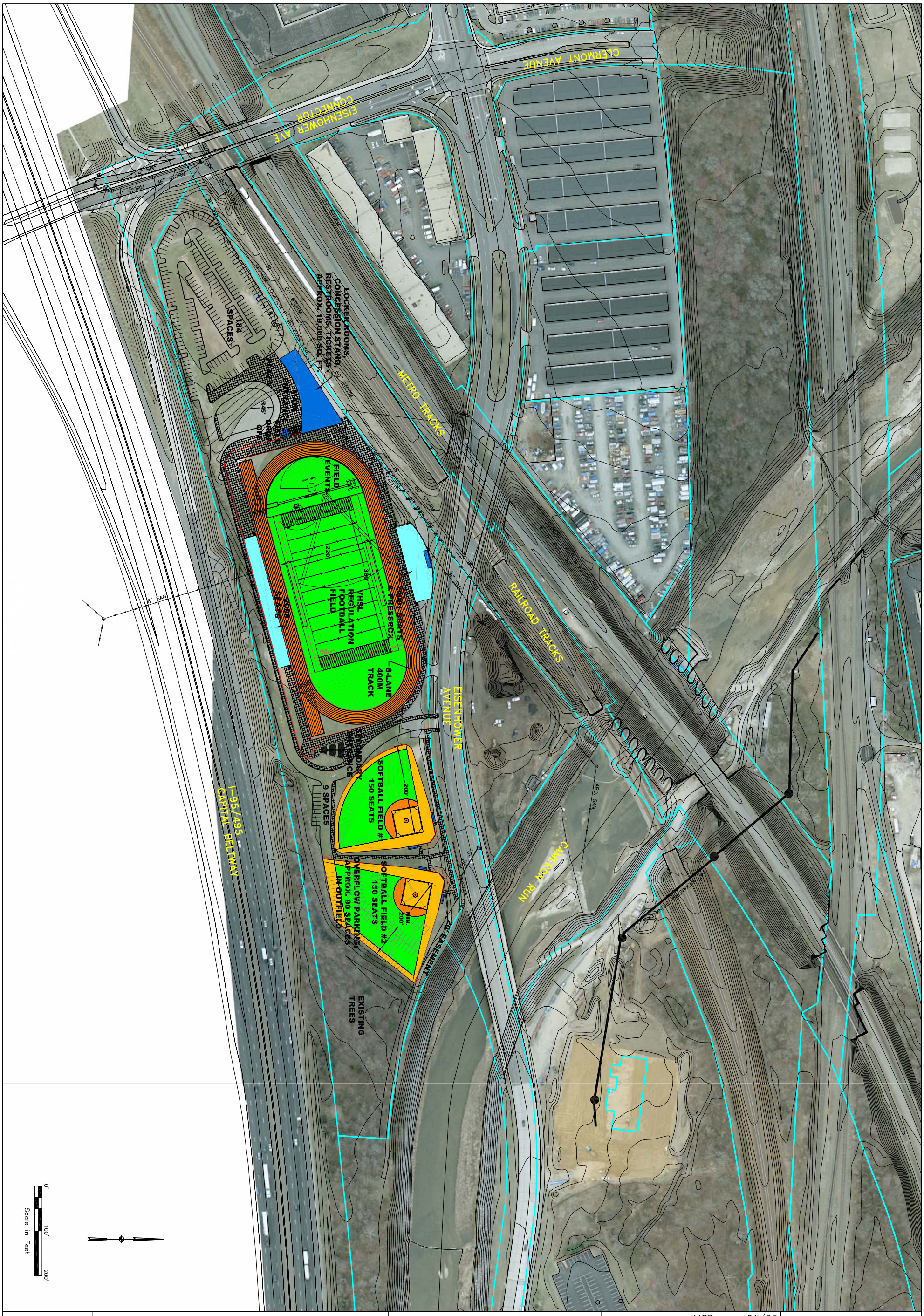
- Safety / Security – proper fencing enclosing individual facilities and adequate buffer zones between the site and adjacent roadways / railways / waterways;
- Vehicular and Pedestrian Access – efficient on-site circulation, parking configuration, pedestrian crossings and sidewalks, compliance with ADA, connections to off-site parking lots;
- Accommodation of Transit – adequate turning radii within the site to accommodate buses, provision of shuttles between site and off-site parking during large events, connections to nearby METRO stops, DASH bus routes;
- Stormwater Management – consideration of drainage ditch between site and Capital Beltway, LEED, and low impact alternatives;
- Permitting – needs assessment for what will be required under redevelopment – City construction, USACE 404 permits;
- Adjacent Land Uses – tie-in to nearby Cameron Run Regional Park, future potential redevelopment of Eisenhower Recycling Facility.

3a. Scheme A

A schematic of Scheme A is shown in Figure 8 on the following page. This configuration was conceived to provide the maximum number of athletic fields while still providing for on-site parking demands (193 spaces allotted for paved parking, plus additional parking on grass outfield of the secondary ball field). Due to limitations of topography and space, the option to have both a softball and baseball field within the complex could not be accommodated under this scheme. As such, the constraints of the site yield two softball fields with bleacher seating for 165 at each. The requirements of Title IX of the Education Amendments of 1972 would be met in conjunction with this site and other off-site facilities (at other park sites).

This scheme also assumes that the concession stands, restrooms, and locker rooms are combined in one building, located on the west side of the site. The configuration allows for the majority of the on-site parking in close proximity to these facilities and to the spectator entrance to the stadium / multi-use field. However, this location may be less favorable for those athletes or spectators that are at the softball fields on the east side of the site, because of the considerable distance to traverse. Because this scheme is conceptual only, the site plan could be modified to accommodate the most appropriate design for the City's use, including a separate building for concessions and restrooms on the east side of the stadium.

Internal vehicular access is provided via a service drive that runs along the south side of the site. A single two-way entrance off of Eisenhower Avenue can be provided under this scheme. The access point would be centered between Cameron Run and the Railroad overpass, in the general vicinity of the east-most existing access drive.



CITY OF ALEXANDRIA, VIRGINIA
Transportation & Environmental Services
P. O. Box 178
Alexandria, Virginia 22313

ALL CITY SPORTS FACILITY
FEASIBILITY STUDY

SCHEME A

DESIGN ENGINEER:	MSD	Date:	01/05
CADD ENGINEER:	MSQ	Date:	01/05
DIVISION CHIEF:		Date:	
CITY ENGINEER:		Date:	
DIRECTOR T&ES:		Date:	

REVISIONS

Date:	INITIALS	COMMENTS

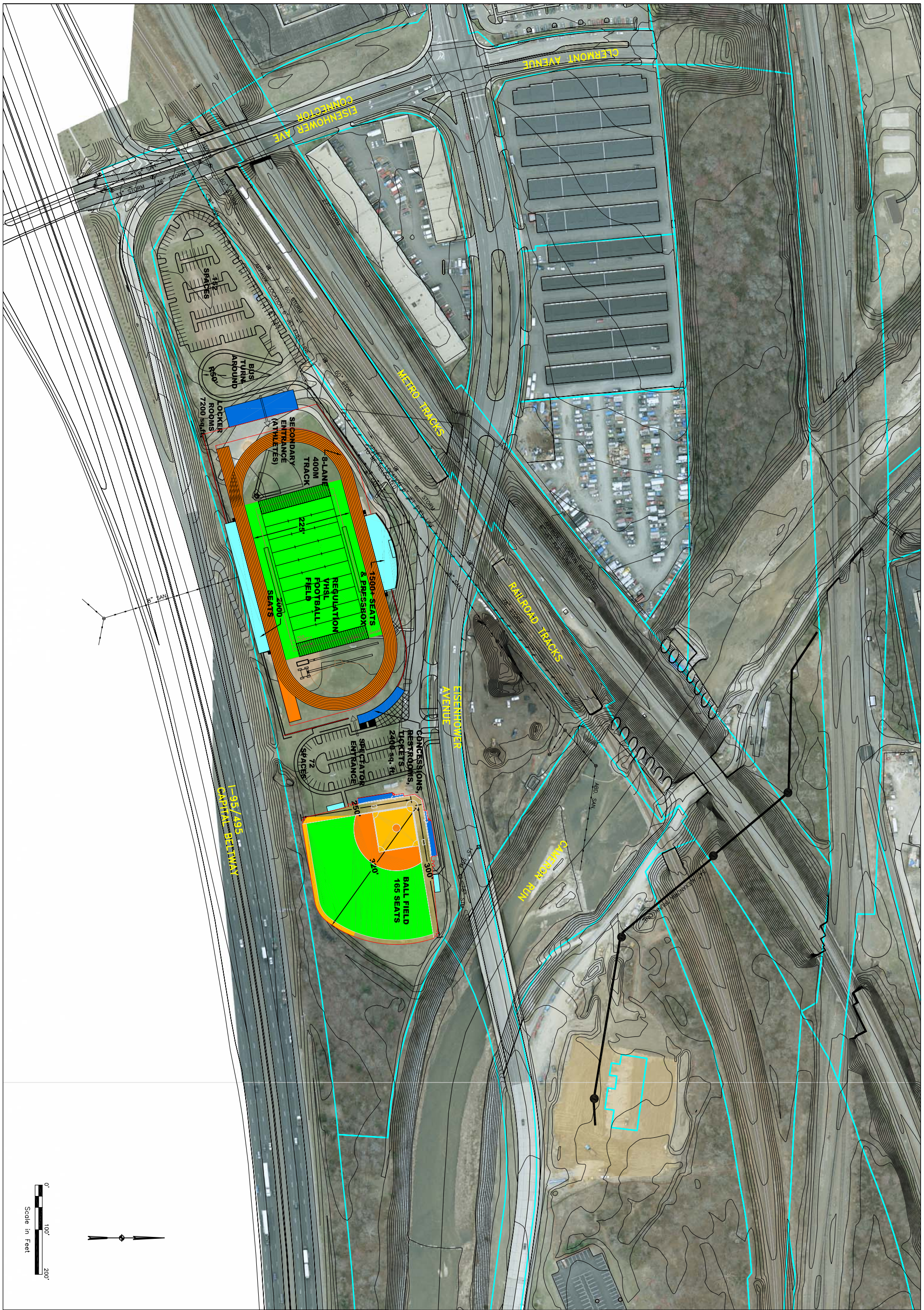
FIGURE 8

3b. Scheme B

Figure 9 shows the proposed concept plan for Scheme B on the following page. This configuration was conceived to provide either a full-size baseball field or softball field, and still accommodate on-site parking program requirements (224 spaces provided). The requirements of Title IX of the Education Amendments of 1972 would be met in conjunction with this site and other off-site facilities (at other park sites). Due to limitations of topography and space, the option to have both a softball and baseball field within the complex could not be accommodated under this scheme. As such, the constraints of the site yield only one ball field with seating for 165. Due to grading issues, the right outfield would be 250 feet deep, while the left outfield would measure 300 feet. These dimensions would not provide for a fully regulation-size baseball field, but a softball field can be accommodated.

This scheme also assumes that the concession stands and restrooms will be located on the east side of the proposed stadium, allowing for a more centralized location and better access to the baseball field, as compared with Scheme A. The primary entrance to the stadium and multi-use field would also be incorporated into the concession stands and restrooms. One disadvantage to this location would be that the majority of the parking (152 spaces) is proposed on the opposite side of the stadium from the spectator entrance. However, the layout of Scheme B allows for significantly more parking adjacent to the ball field than what is proposed under Scheme A (72 spaces versus 9 spaces).

One other major difference between this scheme and Scheme A is that internal access is shifted to the north side of the site. This reduces the buffer area between the stadium and the exit ramp from the Capital Beltway. As with Scheme A, a single access point would be provided on Eisenhower Avenue, in the general vicinity of the east-most existing access drive.



CITY OF ALEXANDRIA, VIRGINIA
Transportation & Environmental Services
P. O. Box 178
Alexandria, Virginia 22313

ALL CITY SPORTS FACILITY
FEASIBILITY STUDY

SCHEME B

DESIGN ENGINEER:	MSD	Date:	01/05
CADD ENGINEER:	MSQ	Date:	01/05
DIVISION CHIEF:		Date:	
CITY ENGINEER:		Date:	
DIRECTOR T&ES:		Date:	

REVISIONS

Date:	INITIALS	COMMENTS

FIGURE 9

3c. Scheme C

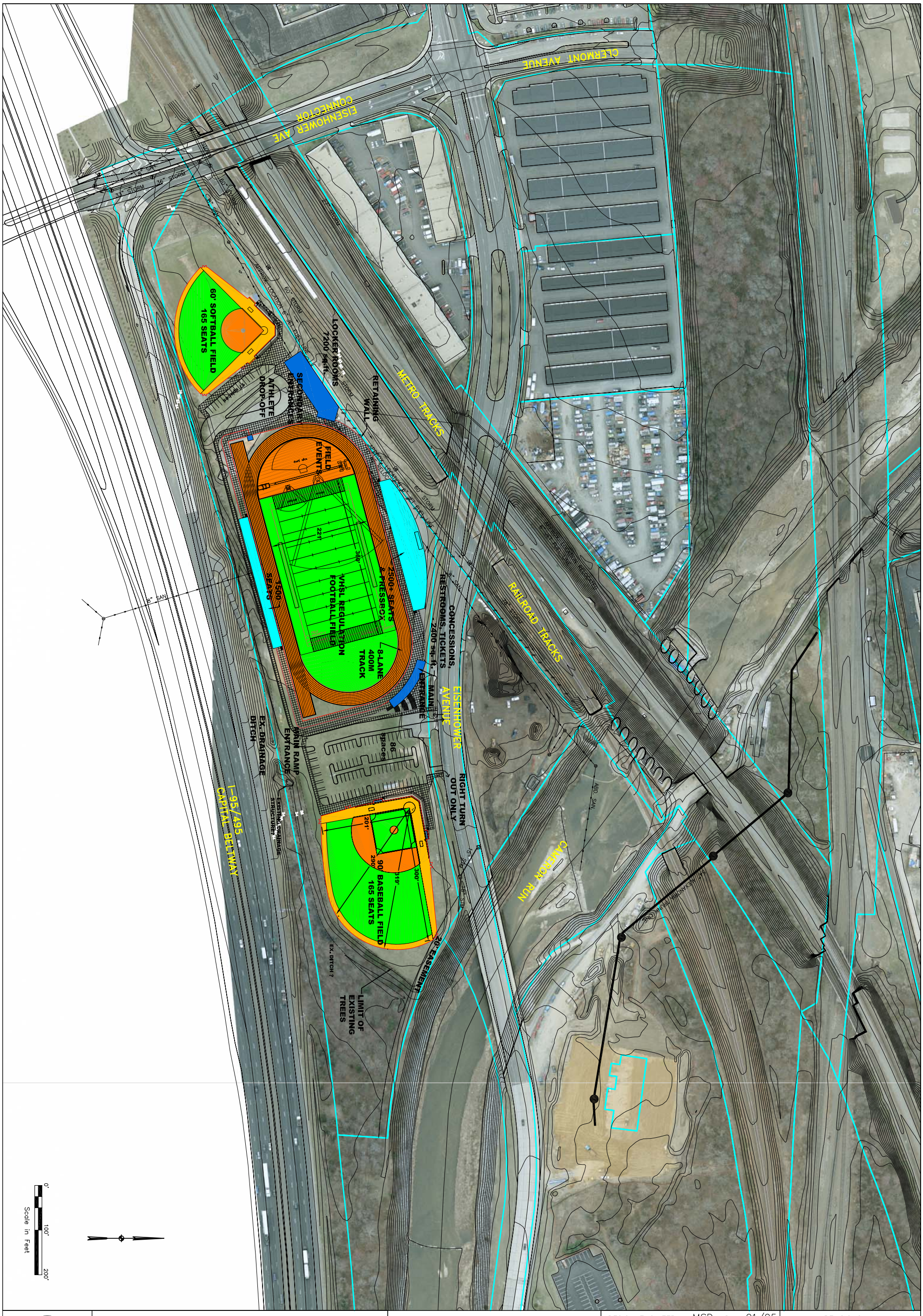
The proposed conceptual plan for Scheme C is shown on the following page in Figure 11. This configuration was conceived to provide a baseball field but also satisfy all of the requirements of Title IX of the Education Amendments of 1972.

In order to allow for equal provision of facilities for boys' and girls' high school sports at the site, a full-size baseball field would have to be complimented by a regulation-size softball field so that games could be played by boys and girls simultaneously. The site can accommodate two balls fields, in addition to the program requirements established by AACSF, but at the expense of on-site parking. Under the proposed layout for Scheme C, parking would be limited to 86 spaces in the main lot, between the baseball field and the stadium / multi-use field, and 17 spaces in the auxiliary lot between the softball field and the stadium / multi-use field.

The optimal layout to maximize use of space for Scheme C is configured such that the baseball field is on the east side, the soft ball field is on the west side, and the stadium / multi-use field is between. Due to grading issues, the right outfield of the baseball field would be 220 feet deep and the left outfield would be 300 feet deep. The softball field size would not be constrained by topography. Seating for 165 would be provided at both the baseball field and softball field.

This scheme also assumes that the concession stands and restrooms will be located on the east side of the proposed stadium / multi-use field, allowing for a more centralized location and better access to the baseball field, as compared with Scheme A. The primary entrance to the stadium and multi-use field would also be incorporated into the concession stands and restrooms. The one disadvantage to this configuration would be that restrooms would on the opposite side of the stadium from the softball field.

Similar to Scheme A, the internal access drive runs along the south side of the site. This provides a buffer area between the stadium and the exit ramp from the Capital Beltway. The main access point could be provided on Eisenhower Avenue under Scheme C, in the general vicinity of the east-most existing access drive, while an auxiliary right-out exit could be located approximately 115 feet east of the main entrance.



CITY OF ALEXANDRIA, VIRGINIA
Transportation & Environmental Services
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Alexandria, Virginia 22313

ALL CITY SPORTS FACILITY
FEASIBILITY STUDY

SCHEME C

DESIGN ENGINEER:	MSD	Date:	01/05
CADD ENGINEER:	MSQ	Date:	01/05
DIVISION CHIEF:		Date:	
CITY ENGINEER:		Date:	
DIRECTOR T&ES:		Date:	

REVISIONS

Date:	INITIALS	COMMENTS

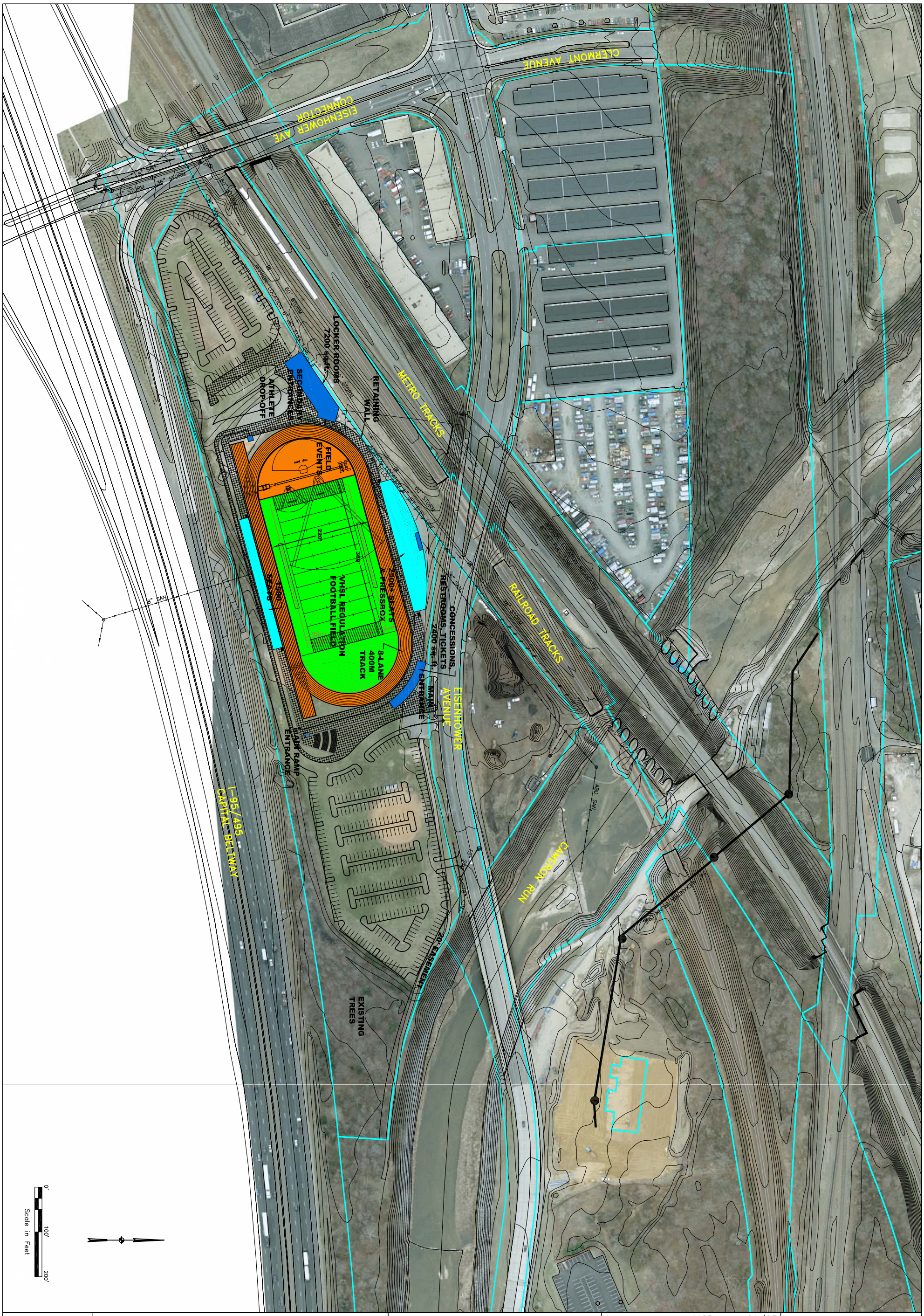
FIGURE 10

3d. Scheme D

Scheme D is a modification of Scheme A, as shown on the following page in Figure 11. This configuration was conceived to provide the maximum number of on-site parking spaces (285 spaces allotted in the main lot and 187 spaces in the auxiliary lot). Due to limitations of topography and space, this option does not provide for any ball fields.

This scheme assumes that the concession stands and restrooms will be located on the east side of the proposed stadium, allowing for a more centralized location and better access to the majority of the parking, as compared with Scheme A. Locker rooms and the secondary entrance point for athletes will be located on the west side of the stadium, adjacent to the turn-around and drop-off area.

Internal vehicular access is provided via a service drive that runs along the south side of the site. A single two-way entrance off of Eisenhower Avenue can be provided under this scheme. The access point would be centered between Cameron Run and the Railroad overpass, in the general vicinity of the east-most existing access drive.



CITY OF ALEXANDRIA, VIRGINIA
Transportation & Environmental Services
P. O. Box 178
Alexandria, Virginia 22313

ALL CITY SPORTS FACILITY
FEASIBILITY STUDY

SCHEME D

DESIGN ENGINEER:	MSD	Date:	01/05
CADD ENGINEER:	MSQ	Date:	01/05
DIVISION CHIEF:		Date:	
CITY ENGINEER:		Date:	
DIRECTOR T&ES:		Date:	

REVISIONS

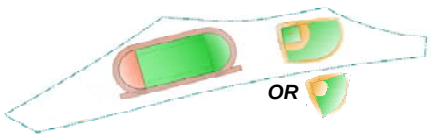
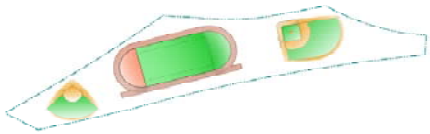
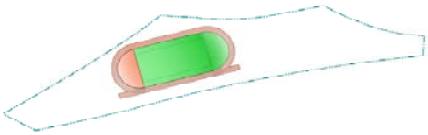
Date:	INITIALS	COMMENTS

FIGURE 11

3e. Scheme Comparison Summary

Each scheme satisfies different program element priorities. There are benefits and drawbacks to each alternative. Scheme A provides the option for additional grass parking during high-peak scenarios, while allowing for two ball fields. Scheme B allows for more permanent surface parking, but is constrained to one ball field. Scheme C allows for a baseball and softball field, but has very limited parking. Scheme D provides significantly more on-site parking, but at the expense of the ball fields. A general comparison of the four schemes devised is shown in Table 1 below.

Table 1. Scheme Comparison Matrix

	Site Configuration	Program Elements	Parking Spaces	Restrooms / concessions / tickets
SCHEME A		4,000-seat Stadium w/ Multi-use Field & Track 2 Softball Fields w/ 150 Seats (1 primary field - play only & 1 secondary field - recreational play / overflow parking)	283 (193 paved)	West Side Consolidated w / Locker Rooms (Separate Locker Rooms an option)
SCHEME B		4,000-seat Stadium w/ Multi-use Field & Track Baseball field w/ 165 Seats *OR* Softball Field w/ 165 Seats	224	East Side Separate from Locker Rooms
SCHEME C		4,000-seat Stadium w/ Multi-use Field & Track Baseball field w/ 165 Seats Softball Field w/ 165 Seats	103	East Side Separate from Locker Rooms
SCHEME D		4,000-seat Stadium w/ Multi-use Field & Track	472	East Side Separate from Locker Rooms

4. Hensley Park Site Detailed Analysis

A number of issues were examined in more detail as part of a preliminary analysis for the Hensley Park Site. The analysis includes Environmental Issues, Geotechnical Issues, Hydraulics Issues and Transportation Issues. Each analysis element assumes that any of the schemes discussed in Section 3 may be considered for selection as the preferred alternative.

4a. Environmental Issues

The Environmental Issues analysis examined two major aspects of the existing conditions at the site. The first area of concentration includes an examination of wetlands, threatened and endangered species, historic resources, and regulations related to the Chesapeake Bay Preservation Area. The second aspect of the environmental review examines soil / groundwater contamination and results of a supplemental subsurface investigation at the site.

4.a.1. Wetlands / Environmental Impacts

Preliminary Wetland Identification

Earth Tech reviewed United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps to locate any previously mapped wetlands on the Property. NWI maps are developed based on various imagery and mapping and are not field delineated. According to the NWI map of Alexandria, Virginia, no mapped wetlands are present on the Property.

Earth Tech performed a preliminary site wetland identification survey of the proposed sports facility expansion at Eisenhower Avenue to identify areas of potential wetlands (depressed areas of standing water, saturated soils, or wetland vegetation) within the project site. According to the United States Army Corps of Engineers (USACE) Wetland Manual, wetlands must possess

hydrophytic vegetation, hydric soils, and wetland hydrology. Based on the wetland identification survey, potential wetlands (areas where at least one of the 3 required characteristics of a wetland are present) or other waters of the U.S. were identified at the following locations and are approximated on Figure 12 (following page):

- South of the eastern existing baseball field, adjacent to the Capital Beltway
  - Potential non-tidal emergent wetland
  - Hydrophytic vegetation and standing water were present
  - Area is well outside the proposed project limits
- Southeast of the eastern existing baseball field, immediately within the wooded area
  - Potential non-tidal forested wetland
  - Indicators of hydric soil were present, such as saturated soils and low chroma (gray) colors
- South of the proposed track
  - Existing drainage ditch
  - Defined bed and bank, composition of stream bed differs from adjacent substrate
  - No standing or flowing water present at the time of the site visit

Based on current proposed development plans, it is not anticipated that more than 1/10 of an acre of wetlands/waters of the U.S. will be impacted; therefore, no mitigation will likely be required. However, areas of wetland/waters of the U.S. impacts and associated mitigation requirements can not be determined until after a jurisdictional wetland/waters of the U.S. determination and delineation is completed and confirmed by a member of the USACE staff. [1]

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1. The Commonwealth of Virginia is authorized by the Secretary of the Army and the Chief of Engineers pursuant to Section 10 of the Rivers and Harbors Act of 1899, and Section 404 of the Clean Water Act to perform certain categories of activities as authorized under the USACE State Program General Permit (SPGP) and the Virginia Department of Environmental Quality (VDEQ) Virginia Water Protection (VWP) general permit programs. Activities authorized under the USACE SPGP program are categorized by size of impact area up to one-acre of nontidal wetlands, including 2,000 linear feet of stream channel. VDEQ VWP permits are generally required in addition to a USACE permit. The conditions of the VDEQ VWP permits are currently being revised and will be effective for all permit applications submitted after January 2005. VDEQ VWP general permits are divided by type of activity, in addition to extent of impact area up to two acres of non-tidal wetlands, including 500 linear feet of perennial stream channel, and

up to 1,500 linear feet of non-perennial stream channel. Impacts to wetlands/waters of the U.S. exceeding 1/10 of an acre of non-tidal wetlands, or 300 linear feet of stream, will require mitigation in the form of several options including creation, restoration, monetary contribution to an approved mitigation bank, or monetary contribution to an in-lieu fee fund.

Project development activities within waters of the Commonwealth of Virginia require utilizing the Joint Permit Application (JPA) process. The JPA is used by USACE, VDEQ, the Virginia Marine Resources Commission (VMRC), and Local Wetlands Boards. Prior to the submission of the JPA, the wetlands/waters of the U.S. must have been delineated and a Confirmed Delineation issued by the USACE for all State and federal waters and wetlands (including isolated wetlands). During initial design phases of the project, the consultant would complete a jurisdictional wetlands/waters of the U.S. determination and delineation in accordance with the USACE Wetlands Delineation Manual (Technical Report Y-87-1) on the entire Property. A USACE jurisdictional confirmation will then be scheduled, prior to submitting a JPA, if permits are required.

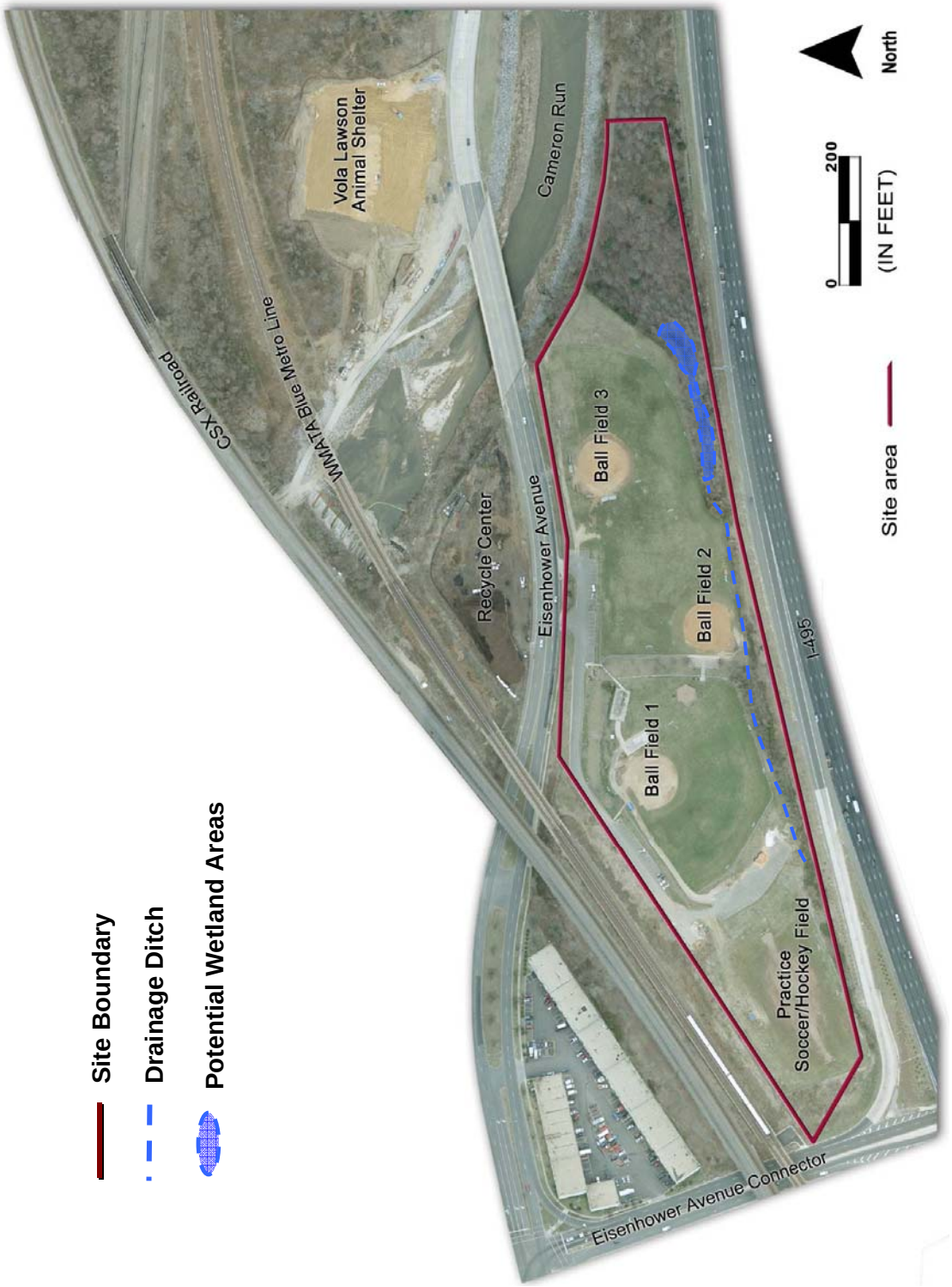

Figure 12. Potential Wetlands Locations

Threatened and Endangered Species

During the permit process, if the USACE determines that an authorized activity may affect federal or state designated critical or proposed critical habitat or a federal or state listed (or proposed) threatened or endangered species, it will initiate consultation with the USFWS pursuant to Section 7 of the Endangered Species Act. As part of the review process, the VDEQ consults with both the Virginia Department of Conservation and Recreation (VDCR) and the Virginia Department of Game and Inland Fisheries' databases.

In order to evaluate the presence of federal or state listed threatened or endangered wildlife species, a 3-mile search radius of the site was conducted using an online database maintained by the Virginia Department of Game and Inland Fisheries (VDGIF). The database provides a list of the federal and state threatened or endangered species that are known or likely to occur within the 3-mile search area. The presence of listed threatened or endangered species was not observed during any site visits. Explanations of why these species are not believed to occur at this specific location are provided below.

The threatened or endangered species included on this list include bald eagle, migrant loggerhead shrike, Henslow's sparrow, Appalachian grizzled skipper, brook floater, wood turtle, loggerhead shrike, peregrine falcon, and upland sandpiper. Bald eagles and peregrine falcons typically prefer coasts, lakes and rivers, and are seen along mountain ridges during migration. Henslow's sparrow typically breeds in neglected weedy fields commonly of broomsedge, wet meadows, and saltmarsh edges, while the upland sandpiper requires extensive grass areas (10-15 acres) with grass heights ranging from 1-3 feet. The project site consists of open maintained sports playing fields, with a small portion of wooded area located adjacent to the Capital Beltway, which is not preferable habitat for any of the above threatened or endangered species. The project site is in close proximity to the Potomac River, which has documented sightings of the bald eagle; however, the presence of bald eagles has not been observed during site visits. The brook floater and wood turtle typically prefer clear brooks and streams. Based on site visits, no perennial streams are located on the project site. The migrant loggerhead shrike and loggerhead shrike prefer open grassland that is grazed or mowed to keep grass short; however, these species were not listed on the VDCR, Natural Heritage Program (NHP) database, as existing in the City of Alexandria.

In order to evaluate the presence of federally listed or state listed threatened or endangered species, including plants and invertebrates, a search was conducted for the City of Alexandria, using the VDCR NHP database. Five threatened or endangered species of vascular plants and two invertebrates have been identified in the City of Alexandria. The listed plant and invertebrate species were last observed in the City of Alexandria in 1902 - 1948.

Based on the research conducted above, it is not anticipated that the construction of this project will result in adversely affecting any threatened or endangered species. During site visits, observations will be conducted to further confirm the lack of habitat and presence of any of the above-mentioned species.

Historic Resources

During the JPA process, the Virginia Department of Historic Resources (VDHR) will review the permit application package to determine whether the proposed construction will impact any historical resources.

Earth Tech conducted a search for architectural and archaeological points of interest using available databases, maintained by the VDHR in Richmond, Virginia on November 18, 2004. No architectural or archaeological points of interest were mapped on the project site or immediately adjacent to the project site. Based on the lack of historical points of interest at the project site, it is not anticipated that VDHR will request further investigation of the project site prior to construction of the proposed facility.

However, according to the Office of Historic Alexandria (OHA), the site may have the potential for prehistoric Native American resources. Therefore, as the project moves forward, additional archaeological review of the planned excavated soils may need to be performed as part of the design for the project site. However, it should be noted that the site has been significantly regraded with 10 feet or more of fill in the western portion of the site prior to construction of the current athletic fields.

Local Environmental Regulatory Requirements

Legislation pertaining to Chesapeake Bay Preservation Areas has been adopted by the City of Alexandria. Specific local requirements of the City of Alexandria include regulations for the preservation of the Chesapeake Bay Area waters and wetlands. Chesapeake Bay Preservation Areas include Resource Protection Areas (RPAs) and Resource Management Areas (RMAs). During field wetland delineation activities, the consultant would classify all streams on the project site as perennial, intermittent, or ephemeral. The stream classification determination is required to assist in the designation of Resource Protection Areas (RPAs). The field stream classification is conducted according to the Chesapeake Bay Local Assistance Department guidelines, which recommends field determinations such as the Perennial Stream Field Identification Protocol, May 2003 (Fairfax County).

A RPA extends 100 feet landward of all perennial streams. Adjacent to the project site is Cameron Run, a mapped perennial stream; therefore, the RPA extends into the project site. Based on current proposed construction plans, it is not anticipated that development would occur within the RPA. If future plans require development within a RPA, a water quality impact assessment

must be submitted to, and approved by, the City of Alexandria for any proposed development within an RPA, including any vegetative conservation area modification or reduction. The City of Alexandria may require mitigation planting to compensate for any vegetation lost.

Similar to the RPA vegetation preservation area, a 50-foot buffer is designated landward of all intermittent streams and non-tidal wetlands that are not considered RPAs in the City of Alexandria. If encroachment of the 50-foot buffer is anticipated, a water quality impact assessment must be submitted to, and approved by the City of Alexandria. During the preliminary wetland/waters of the U.S. identification site visit, a few potential wetland areas were noted on the project site. Following a jurisdictional determination and field stream classification, a 50-foot buffer may be established landward of these areas.

4.a.2. Environmental Site Review

Purpose

This section presents the results of an environmental review conducted at Joseph Hensley Park, located at 4200 Eisenhower Avenue, Alexandria, Virginia (the *property*). The primary objective of this environmental review was to assess the *property* for the potential presence of soil contamination by petroleum and volatile hydrocarbons.

The environmental review of potential soil and groundwater contamination was initiated following review of geotechnical subsurface evaluation reports conducted by EBA Engineering, Inc. as part of this study. In November 2004, while installing geotechnical borings for preliminary subsurface investigation related to engineering elements, site workers reported subsurface odors and significant organic vapor meter readings. No evidence of soil staining or hydrocarbon product was observed in soils at that time.

In order to further assess the *property* for potential soil and groundwater contamination, the following activities were performed:

- Reviewed selected state and Federal regulatory agency databases for listings of the *property* and for sites within selected radii around the *property*.
- Evaluated the history of the *property* through review of available reports, Sanborn™ Fire Insurance maps, topographic maps, and aerial photography.
- Performed a limited review of adjoining properties to identify the potential presence of activities using petroleum or organic hydrocarbons that could affect the *property*.

- Installed eight 20-foot deep soil borings co-located with the geotechnical borings and screened soils with an organic vapor meter for the presence of contamination.
- Selected three soil samples for laboratory detection of volatile organic contaminants, diesel range and gasoline range organic petroleum hydrocarbons.
- Prepared a report presenting our findings and recommendations.

Limitations and Exceptions of Review

This environmental review did not include a site reconnaissance of the facility's buildings or of all *property* grounds. There was no evaluation for the presence of other regulated substances including; PCBs, lead paint, asbestos, radon, or methane at the surface, in the subsurface, or in facility buildings.

No site-wide subsurface investigation or sampling and analysis of groundwater or surface water were conducted. The purpose of this site assessment was solely to assess the potential for soil and groundwater hydrocarbon contamination.

Environmental Review Conclusions

The subsurface soil screening and soil sample analysis conducted does not indicate soil contamination at the *property*. [2] Elevated PID readings, as reported during the geotechnical investigation (see Section 4b.) may have been the result of moisture interference with the PID instrument.

However, the documentation on existing site conditions is not sufficient to fully assess the potential for soil and groundwater contamination over the entire site or the potential range of waste types and handling procedures that may be required during site excavation work.

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2. Subsurface Investigation Results

On December 15, 2004, eight 20-foot deep soil borings were installed, co-located with previous geotechnical borings conducted by EBA Engineering. Figure 13 (in Section 4b. Geotechnical Issues) shows all soil boring and soil sampling locations. The soil borings were installed using a geoprobe direct push soil sampling system. A continuous 4-foot soil sample was obtained from ground surface to 20 feet below ground at each borehole. Each 4-foot soil sample was composited into a zip-lock bag and placed in the field vehicle to warm the sample to room temperature. The Photo-ionization detector (PID) probe was then utilized to pierce the zip-lock bag to obtain a headspace measurement of organic vapor concentration released from the soil. The soil screening PID measurements are provided in Table 3. No elevated PID readings were measured in soils.

Three soil samples were selected for laboratory analysis of volatile organic contaminants (VOCs by EPA Method 5035/8260) and diesel and gasoline range total petroleum hydrocarbons (TPH DRO-GRO by EPA Method 8015B). Figure 13 shows all soil boring and soil sampling locations. A soil sample was collected at soil boring BH-02 at four feet below ground; soil boring BH-04 at 16 feet below ground; and at soil boring BH-08 at four feet below ground. Soil samples submitted for laboratory analysis were collected prior to PID measurement to reduce the potential for loss of volatile organics. A courier drove the soil samples to Phase Separation Science, Inc., located in Baltimore, Maryland for laboratory analysis.

The laboratory analysis results for the three soil samples (BH-02, BH-04, BH-08) were below laboratory detection limits for VOCs and TPH GRO-DRO.

Table 2. Organic Vapor Screening Results (Photo-ionization Measurements)

Soil Sample Interval and PID Reading (PPM)					
Depth	**0”-4”**	**4”-8”**	**8”-12”**	**12”-16”**	**16”-20”**
BH-01	**1.4**	**8.3**	**18.9**	**18.5**	**1.0**
BH-02	**2.3**	**5.8**	**2.0**	**4.0**	**3.8**
BH-03	**2.1**	**5.5**	**3.6**	**4.7**	**5.2**
BH-04	**2.0**	**3.3**	**5.0**	**1.7**	**6.3**
BH-05	**2.5**	**1.1**	**1.7**	**1.9**	**2.7**
BH-06	**3.2**	**2.1**	**2.7**	**1.4**	**0.0**
BH-07	**1.1**	**1.9**	**1.6**	**2.6**	**3.2**
BH-08	**0.3**	**8.3**	**4.2**	**0.0**	**1.0**

A review of the DEQ LUST database indicates five LUST sites existed within one-eighth to one-quarter mile of the *property*. These sites may have affected groundwater at the *property*. One LUST site is located at 5500 Clermont Drive, directly up gradient of the *property*. The site characterization and corrective action conducted at this *property* have determined that petroleum contamination relating to the LUST is no longer a risk to human health or the environment. However, a groundwater depth of 3 feet below surface and a groundwater linear velocity of 271 feet per year were documented at this site during site characterization activities. Therefore contamination released to the shallow groundwater or surface water in this area could have potentially impacted the groundwater at the subject site within one year.

Based on review of historical aerial photography (See 1974 Photo) depicting debris strewn across the 5500 Clermont Drive site, adjacent commercial properties, and the then-vacant *property*, there is also a potential for historical soil and groundwater impacts from surface dumping at the *property*.

Environmental Review Recommendations

Although the environmental subsurface investigation conducted as part of this environmental review does not indicate soil contamination, past histories of soil contamination at adjacent sites, particularly up-gradient of the subject *property*, provide sufficient justification that some level of petroleum soil contamination and/or groundwater contamination may be encountered during earthwork, utility, and/or foundation construction activities for the All Sports Facility complex. As such, additional soil and groundwater testing should be conducted during the design phase of the All City Sports Facility to ensure sufficient and accurate data is included in the contract documents prior to advertisement.

In the event that petroleum contaminated soils and/or groundwater contamination is determined to exist on-site, several measures may be incorporated into the contract plans for mitigation. These include:

- Vapor barriers for petroleum contaminated soils left undisturbed
- Excavation, hauling, and disposal of petroleum contaminated soils excavated during construction
- Discharge dewatering water into the City of Alexandria sanitary sewer
- Clean soil capping of spoil fields

Contingency costs associated with these mitigation measures are included in the cost estimate provided as part of this report. It is important to note that the cost contingencies included, provide an estimate for mitigation related to petroleum contaminated soils and groundwater. Although no information to date indicates the presence of hazardous materials, no specific cost contingencies are included for mitigation of hazardous materials.

Furthermore, the existing site topography consists of three tiered levels dropping in elevation from west to east. The existing soccer field, on the westernmost tier, lies at approximately elevation 90; the center softball field, on the center tier, lies at approximately elevation 76; and the two adjacent softball fields, in the easternmost tier, lie at approximately elevation 58. The proposed conceptual grading plan approximately maintains the elevation of the center tier, excavates the western tier (to approximately the same elevation as the center tier), and utilizes the excavated material as fill for portions of the eastern tier to accommodate a flat stadium area as shown in the proposed sport layout schemes.

Therefore, as the majority of site excavation would be conducted at the western tier (approximately 14'), additional testing activities should concentrate in this area. Two soil borings were conducted as part of this study in this area to a depth of approximately 20' and as indicated previously, no contamination was detected. In addition, the geotechnical borings performed as part of this study determined that the groundwater elevation is approximately 10' below the easternmost tier, therefore, excavation below the groundwater elevation should be limited to utilities and foundations.

In summary the following recommendations are made subsequent to the environmental review conducted for this project:

- Preliminary investigations indicate that the environmental conditions are generally acceptable such that the project site may be developed to accommodate the proposed program elements.
- Additional environmental characterization of planned excavated soils should be conducted during final site design of the All-City Sports Facility. Based on soil analysis results to date, the City should anticipate that a solid waste management plan should be adopted by the contractor prior to construction and approved by the City. The management plan should meet or exceed the waste handling and potentially contaminated soil requirements provided in the contract documents for site work.
- If the soils are geotechnically unsuitable, and are to be disposed of off-site, the disposal facility should be contacted to determine soil analysis requirements for pre-characterization and acceptance purposes. The disposal facility should also be identified in a waste management plan and approved by the City.
- Groundwater grab samples should be obtained prior to conducting planned excavations to define dewatering procedures. During the design phase, the City should determine the following: feasibility of discharging dewatering water into the City of Alexandria sanitary sewer, analytical requirements for potential dewatering discharge, and the acceptance criteria for the discharge water. If the City of Alexandria cannot accept water from dewatering activities, a VPDES Permit and discharge sampling may be required. If the groundwater is contaminated, a pretreatment system may be required prior to discharge. The dewatering procedure and potential treatment issues should be identified as soon as possible once the final site design is selected to allow for permitting and to ensure that appropriate language is included in the contract documents prior to advertisement.
- Design and construction of the proposed facility should anticipate the possibility of encountering some contamination and provide in the

design or contract documents appropriate means to mitigate or remove hydrocarbon contamination. Examples include: clean soil capping of spoil fields; vapor barriers over aggregate fill beneath structures; bioremediation of surface water flows and monitoring of excavated soil and pumped groundwater during construction, with treatment and/or disposal methods identified in the contract documents.

4b. Geotechnical Issues

As part of this feasibility study, a limited subsurface investigation was undertaken to provide preliminary geotechnical assessment of the site. For full details and a description of the subsurface conditions and geotechnical properties, reference should be made to the Preliminary Geotechnical Report dated November 2004, submitted as a separate report. This section summarizes the findings of this investigation and provides a basis for the preliminary and design assessment of building foundations, retaining walls, pavements, and SWM drainage facilities. In addition, an estimate of unsuitable material likely to be encountered during construction has been determined from this investigation.

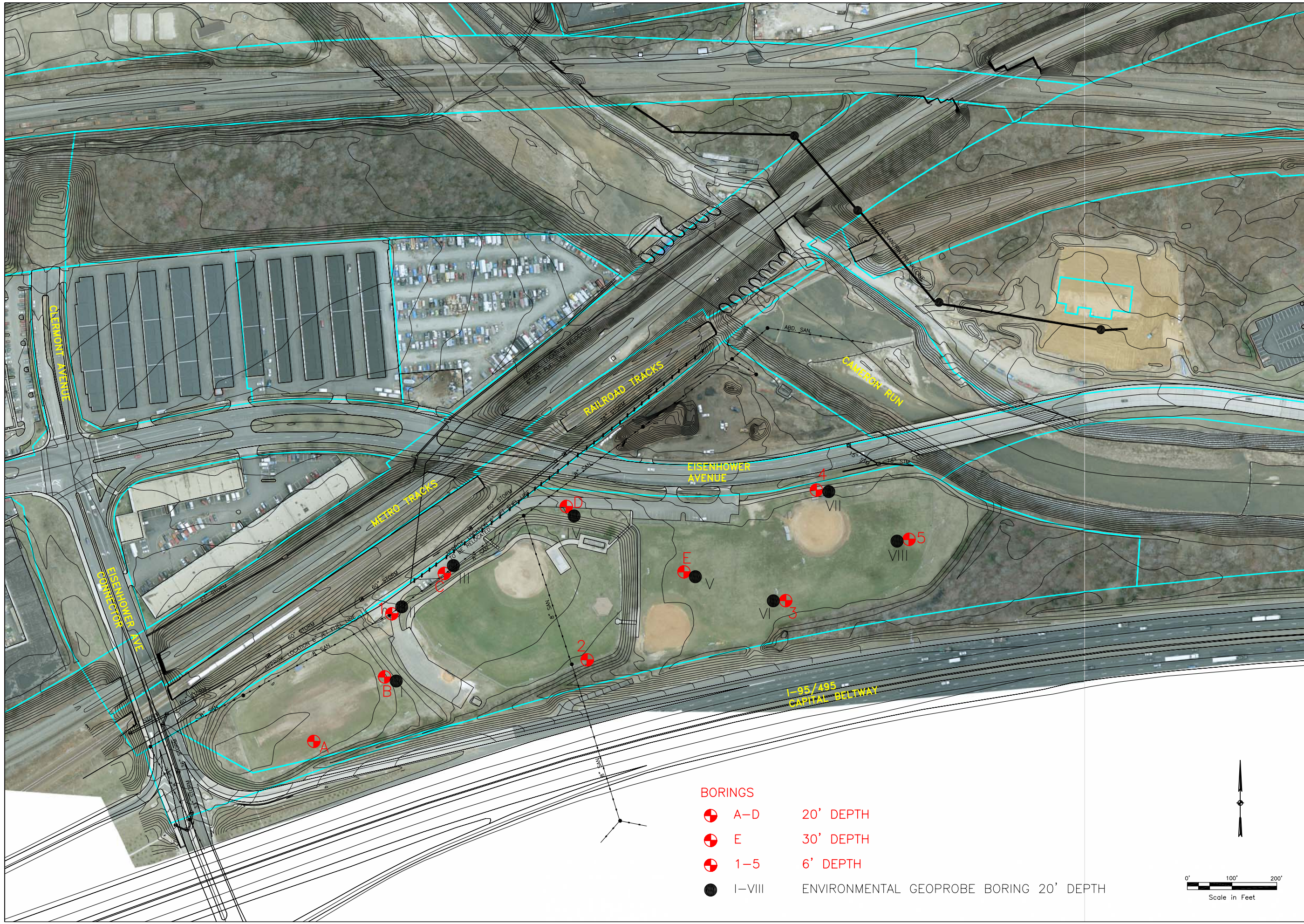
The existing contour plan and the boring location plan is shown in Figure 13. As is evident from the contours, the existing site varies greatly in elevation from east to west. The elevation at the eastern end of the site, in the vicinity of the two ball fields, is at an elevation of +58. The center section of the site, in the vicinity of the third ball field, is at an elevation of +78. The western end of the site, in the vicinity of the soccer field, is at an elevation of +90. To accommodate the primary stadium complex shown in the various schemes developed, a substantial volume of fill is required at the east end of the stadium and track. In an effort to avoid costly borrow material, the grading plan for the proposed scheme will require a substantial cut in the western end of the property to provide adequate fill from on-site. The preliminary proposed grading plan determined that an elevation of +76 for the stadium complex (including the area to the west towards Claremont Avenue) will result in an approximate balance of cut and fill for the site.

At the lower east end of the site, in the vicinity of minor cut locations, five (5) soil borings were drilled to an approximate depth of six feet below existing grade. These borings provide sufficient subsurface information for the parking lot and access roadway design, as well as, utility and subsurface drainage facilities required for the baseball field. The water table is approximately 10 feet below grade in this location.

At the west and center portions of the site, four (4) borings were drilled to an approximate depth of twenty feet below existing grade. These borings provide soil classifications, moisture content and other pertinent subsurface information for the substantial cut and fill required for the project. These soil borings may also be used to determine the structure type of the locker-room building and the bleacher foundations. Preliminary findings indicate that there is little or no rock content – mainly sand and sandy clay soil – suitable for large scale earthwork.

At the center section of the site, one (1) boring was drilled to an approximate depth of thirty feet below existing grade. This boring provides some subsurface information to address the substantial surcharge load on the

existing soil that will result from the extensive fill required at this location. Settlement and consolidation under this load can be expected, but achieved rapidly with no long-term consequences to the buildings. In addition, this soil boring may be useful for the preliminary design of the retaining walls which indicate a flexible wall structure will be needed with some foundation strengthening possible.



DESIGN ENGINEER: MSD Date: 01/05
CADD ENGINEER: MSO Date: 01/05
DIVISION CHIEF: Date:
CITY ENGINEER: Date:
DIRECTOR T&ES: Date:

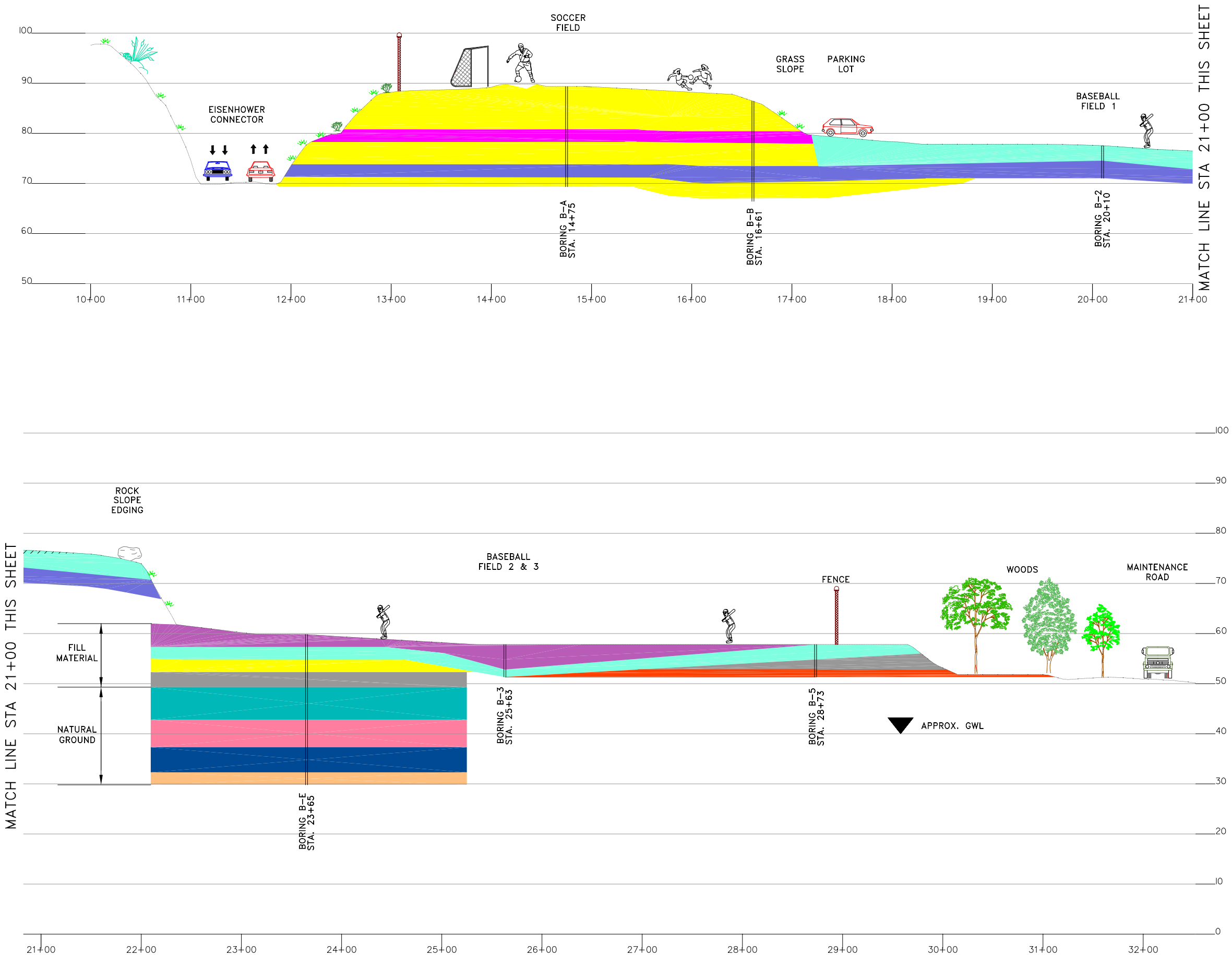
REVISIONS
Date: INITIALS COMMENTS

FIGURE 13

ALL CITY SPORTS FACILITY
FEASIBILITY STUDY

BORING LOCATIONS
EXISTING CONDITIONS

CITY OF ALEXANDRIA, VIRGINIA
Transportation & Environmental Services
P. O. Box 178
Alexandria, Virginia 22313



GEOTECH LEGEND

- MOIST, STIFF SANDY CLAY
- WET, STIFF CLAY, TRACE SAND AND GRAVEL
- MOIST, MED DENSE SAND, TRACE CLAY
- MOIST, MEDIUM STIFF SILT TRACE SAND
- MOIST, MEDIUM STIFF CLAY
- WET, SOFT CLAY/SILT
- WET, LOOSE SILTY SAND
- WET, MED. DENSE/VERY STIFF SANDY CLAY
- WET, VERY STIFF SILT
- MOIST, MEDIUM DENSE SANDY GRAVEL/FILL
- MOIST, MEDIUM STIFF CLAY/ SILT, TRACE GRAVEL

0' 50' 100'
Scale in Feet
H: 1"=100'
V: 1"=20'

REVISIONS		
Date:	INITIALS	COMMENTS

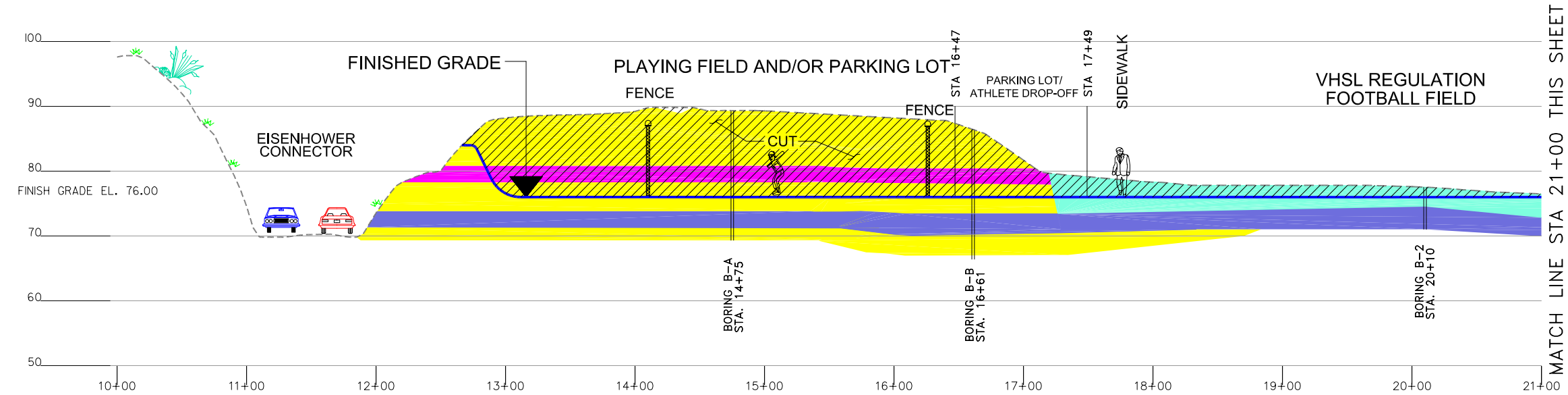
DESIGN ENGINEER:	MSD	Date: 01/05
CADD ENGINEER:	MSQ	Date: 01/05
DIVISION CHIEF:		Date:
CITY ENGINEER:		Date:
DIRECTOR T&ES:		Date:

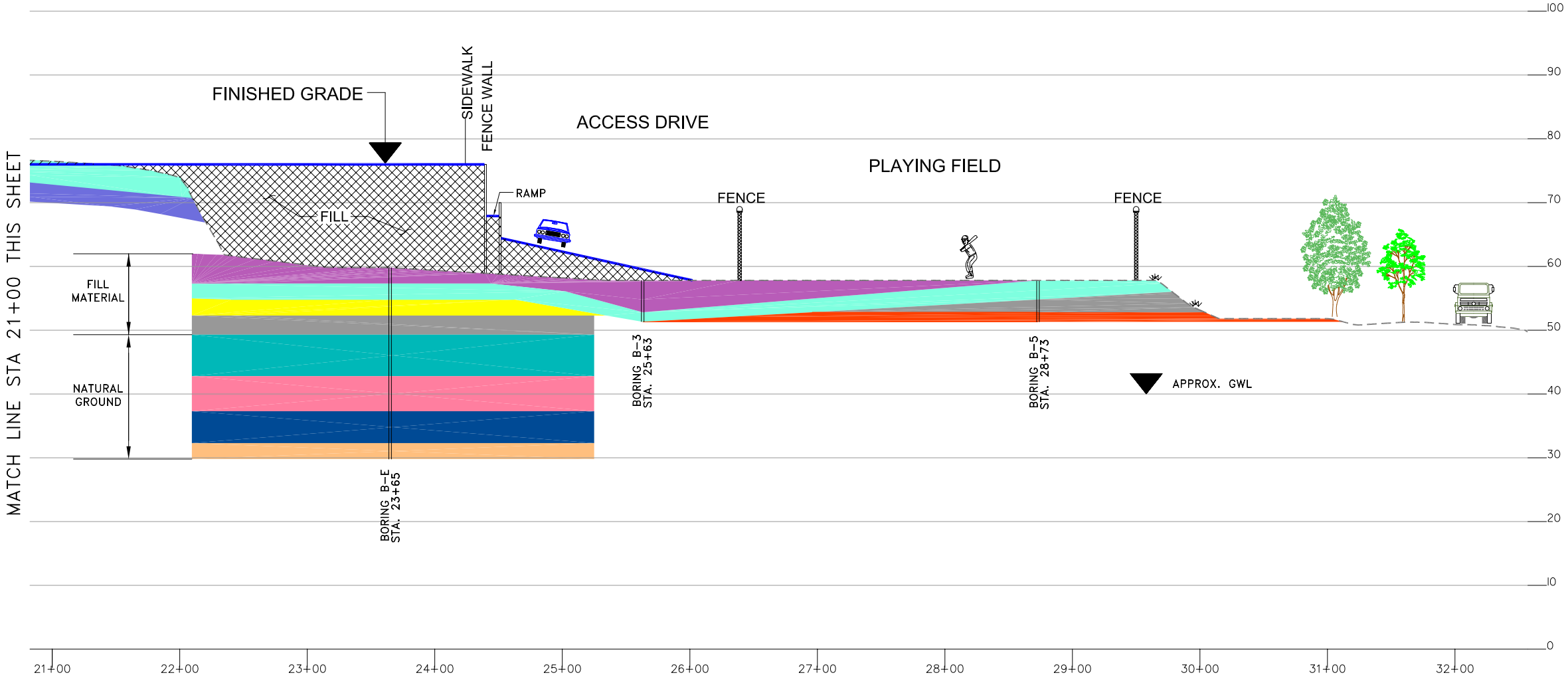
FIGURE 14

ALL CITY SPORTS FACILITY
FEASIBILITY STUDY

GEOTECH
EXISTING SECTION

CITY OF ALEXANDRIA, VIRGINIA
Transportation & Environmental Services
P. O. Box 178
Alexandria, Virginia 22313





GEOTECH LEGEND

- MOIST, STIFF SANDY CLAY
- WET, STIFF CLAY, TRACE SAND AND GRAVEL
- MOIST, MED DENSE SAND, TRACE CLAY
- MOIST, MEDIUM STIFF SILT TRACE SAND
- MOIST, MEDIUM STIFF CLAY
- WET, SOFT CLAY/SILT
- WET, LOOSE SILTY SAND
- WET, MED. DENSE/VERY STIFF SANDY CLAY
- WET, VERY STIFF SILT
- MOIST, MEDIUM DENSE SANDY GRAVEL/FILL
- MOIST, MEDIUM STIFF CLAY/ SILT, TRACE GRAVEL

EARTHWORK LEGEND

- CUT
- FILL
- EXISTING GROUND LINE
- FINISHED GRADE LINE

0' 50' 100'
Scale in Feet
H: 1"=100'
V: 1"=20'

REVISIONS		
Date:	INITIALS	COMMENTS

DESIGN ENGINEER:	MSD	Date:	01/05
CADD ENGINEER:	MSO	Date:	01/05
DIVISION CHIEF:		Date:	
CITY ENGINEER:		Date:	
DIRECTOR T&ES:		Date:	

FIGURE 15

ALL CITY SPORTS FACILITY
FEASIBILITY STUDY

GEOTECH
PROPOSED SECTION

CITY OF ALEXANDRIA, VIRGINIA
Transportation & Environmental Services
P. O. Box 178
Alexandria, Virginia 22313

4c. Hydraulics Issues

A preliminary assessment of drainage issues was performed to determine site needs and potential SWM requirements that may result. As expected, all conceptual plans for the sports facility result in greater roadway and parking surface area compared to the existing condition.

As shown in Figure 13, the topography of the site varies greatly in elevation from east to west. Drainage for the existing site is split, with about half of the area draining towards the north, and about half draining towards the south. Runoff is collected in swales on each side, draining towards storm drains, which drain into Cameron Run, several hundred feet away from the site.

Existing impervious area related to the site is approximately 1.46 ac. Proposed impervious area would range between 2.60 acres and 5.47 acres for the various schemes, an increase of between 1.14 acres and 4.01 acres. This analysis considers the track and stadium field to be designed in such a way that it is pervious. The 10-yr design storm is the basis for SWM design and results in a runoff increase between 6 to 30 cubic feet per second.

Due to the proximity of Cameron Run to the project site, the storm drainage system currently outfalls directly into the main tributary. The proposed outfall system also outfalls directly into Cameron Run. Therefore, the flow increase may be considered insignificant when compared to the watershed of Cameron Run. According to Virginia Code [§4VAC50-30-40 Minimum Standards, 19 b. (1)], an outfall is considered to be adequate when the contributing area to the outfall (point of analysis) is one hundred times greater than the contributing area of the project in question. The drainage area for Cameron Run is almost 34 square miles (21,500 acres) at this location, considerably larger than the area of this project.

However, the increase in impervious area associated with the proposed schemes will require treatment for water quality. This may be accomplished through underground water quality structures such as the Vortechnics or Stormceptor systems. These are proprietary products that remove sediment and hydrocarbons from stormwater run-off and collect it into filters contained within the structures. These structures are typically used in urban areas where available space for an open pond facility is not readily available, such as is the case with the Hensley Site. A six-month maintenance schedule will be required to ensure debris is removed from the filters within the structures.

Other best management practices could be utilized such as “green roofs” and “rain gardens.” Constructing green roofs for the locker room and concession buildings provide excellent opportunities for this type of application. A green roof is a vegetative system that consists of a surface of grass or other vegetation (ice plants, sedum, etc.) on several drainage layers, constructed on the flat roof of a building structure. Rain gardens are low areas on the

grounds of the site that are planted with assorted vegetation. The low spots capture runoff and permit it to percolate into the soil, while the vegetation helps in removing pollutants from the water.

Assuming that the outfalls from the site to Cameron Run are adequate, no water quantity management (detention) will need to be provided. If outfalls are inadequate, storm runoff from the site will need to be reduced to the level of existing runoff by use of stormwater detention, or the outfall to Cameron Run may be improved to meet adequacy requirements. A detailed topographic survey will be required before a determination is possible. If necessary, the proposed parking lot may be graded in such a way to allow for the required detention. However, certain storm events may result in ponding water within the parking lot for various durations after the rainfall event if the lot provides detention.

It is anticipated that runoff from the proposed driveways and parking lot will be collected in a series of curb and yard inlets and conveyed to existing outfalls via a closed storm sewer system. Runoff from the proposed stadium complex will be collected into an underdrain system connected to the closed storm sewer system, while the track and field can be pervious.

As discussed in the geotechnical section of this report, a proposed grading plan may be designed in such a way as to balance the required cut and fill required for the new stadium complex. Basically, this would entail substantial cuts at the western portion of the site for use as fill at the eastern portion of the site in order to expand the current footprint of the center tier. In addition, the existing ditch between I-495 and Hensley Park will need to be regraded to accommodate the entrance roadway, as shown in the proposed schemes. Close coordination will be required with the Virginia Department of Transportation. This regrading will require work within VDOT R/W and will primarily consist of modifying the existing ditch/swale adjacent to the interchange ramp. No impacts to the ramp or clear zones are anticipated at this time.

4d. Transportation Issues

A preliminary assessment of traffic circulation / impacts and parking demand was performed to determine site needs and potential improvements to existing transportation facilities / operations. Although the topographical constraints of the site limit the options for the number and location of access points, the general proximity of the site to multiple regional transportation facilities provides a significant advantage from the outset. Hensley Park is accessible to bus routes, pedestrian trails, Metro (via bus routes) and the Capital Beltway.

On the opposite side of Eisenhower Avenue, Cameron Run Trail, a multi-use pedestrian/bicycle trailway, connects with the Washington and Old Dominion (W&OD) Trail to the west of Interstate 395 and with Eisenhower Metro Station to the east. The closest metro station is Van Dorn Street, located 1.3 miles west of the site. Both Metro stations are accessible by DASH bus. Existing bus stops are located about 0.2 to 0.3 miles on either side of the facility. Depending on the actual modal split of projected trips coming to the site, an additional stop may be appropriate during larger events, especially during the evenings and weekends.

As previously mentioned, the main entrance for all the alternatives will be a two-lane / two-way roadway intersecting Eisenhower Avenue in the vicinity of the existing east-most access drive. A secondary access point, located approximately 100 – 125 feet east of the main drive, will serve as a right-out only exit for Schemes B - D. The intersection created by the main access point was assumed to be unsignalized, based on a preliminary analysis of the site-generated traffic impacts. Due to the nature of the land-use type, peak traffic conditions are likely to be concentrated within a relatively short time frame on Friday nights (approximately five Friday night high school football games per year) or on the weekend (during changeover of soccer games, ball games, and track meets, etc.); the traffic demands could be accommodated by traffic police during high peak events. A more detailed discussion of the traffic demand projections is presented below.

Within the site, an internal access road will skirt the footprint of the track / multi-use field on the east, south, and west sides (except Scheme B, where the access road is to the north of the track / multi-use field). This roadway will be designed to accommodate bus traffic and will include a turn-around and athlete drop-off on the west side of the track, in front of the proposed locker room facility. The roadway will connect the west parking lot with east lot and the bus turn-around.

Parking demands for the site during large-scale events will greatly outweigh the number of surface-level parking spaces that can be provided within the remaining usable space, regardless of which program elements are incorporated. This is not unusual for sports facilities which host events such as

Friday night football which causes peak demand. Projected parking needs for high-peak scenarios (five Friday night football games per year) were based on the conservative assumption that the 4,000-seat stadium would be filled to capacity for certain events, such as a high school football game or major track / soccer event. In addition, athletes and facility service staff were assumed to add another 150 people. A vehicle occupancy rate of 2.5 persons per private vehicle was assumed (based on research of several other similar sites) and to be conservative, modal split for transit was assumed to be negligible. Based on these assumptions, the total parking demand during these high peak times would be approximately 1,660 vehicles.

The approximate number of spaces available on-site ranges from 103 to 472, assuming attendance is at full capacity. However, additional parking off-site may be available at the neighboring parcels to the east, on the north side of Eisenhower Avenue. Just on the other side of Cameron Run, the Vola Lawson Animal Shelter has 46 spaces available. The Cameron Run Park lot has approximately 345 spaces. The combined total for nearby offsite parking is 391 spaces. These lots could be connected to the site via shuttle service (for those unable to walk) and an improved wide sidewalk along Eisenhower Avenue. The remaining parking needs for the five Friday nights per year, ranging from 797 to 1,166 spaces, would have to be addressed with any combination of the following options:

- On-street parking along Eisenhower Avenue (both directions) in the outer lanes, within the vicinity of the site;
- Off-site parking at nearby office building lots and garages, east of the site, arriving on-site via shuttle service (would require a shared-parking memorandum of understanding with property owners for use during non-business hours only);
- Off-site parking at the nearby Van Dorn Street Metro, during evening hours.

If limited parking supply results in higher vehicle occupancy rates (3.0 or greater), the projected demand would decrease by 300 spaces or more, and the shortfall to be addressed by these other means would be 497 to 866 spaces.

During off-peak periods (when the stadium is assumed NOT to be filled to capacity), a trip-rate of 50 vehicle trips per acre was assumed, based on similar studies referenced. Using 12 acres of land on the site, the total vehicle trips generated would be 600. This trip rate would be much more consistent with weekend sporting events held on the ball fields and/or soccer field than the scenario discussed above on Friday nights. Peak hour trips would be divided evenly between ingress and egress traffic, with vehicles leaving at the end of one game while others arrive for the next game. Under these assumptions, 300 arrivals and 300 departures would be expected. Based on the location of the site with respect to the centroid of the City of Alexandria, roughly 2/3 of the trips were estimated to originate from the east, with the remaining 1/3 coming from the west.

Considering the impact of on-site parking constraints, the maximum number of vehicles that could enter would be from 103 to 472, assuming that those vehicles would remain on-site for the duration of the peak hour. In the same way, an assumption of a 100% turnover in parking during the peak hour would yield 103-472 vehicles exiting. The remaining 128-497 vehicles arriving and vehicles departing would be assumed to use the off-site parking available at the Animal Shelter or Cameron Run Park and / or on-street parking along Eisenhower Avenue. Using the origin and destination assumptions associated with Scheme A, the site-generated trips estimated at the entrance to Hensley Park would be 64 eastbound rights, 129 westbound lefts, 64 northbound lefts, and 129 northbound rights. This traffic was compared against the background traffic on Eisenhower Avenue to determine how the traffic operations would be impacted.

Traffic volume data was collected for eastbound and westbound Eisenhower Avenue, by lane and by speed profile. Peggy Malone & Associates collected 24-Hour Count Data beginning Thursday, September 23, 2004 through Wednesday, September 29, 2004. The results of the counts are shown in Table 3 below.

Table 3. Existing Peak Hour Traffic

EISENHOWER AVENUE
WESTBOUND DIRECTION

	Weekday	Friday	Saturday
AM Volume	236	--	--
Peak Period	8:30	--	--
PM Volume	845	812	--
Peak Period	5:00	5:00	--
Event Peak Volume	--	324	340
Peak Period	--	7:00	12:00

EISENHOWER AVENUE
EASTBOUND DIRECTION

	Weekday	Friday	Saturday
AM Volume	1198	--	--
Peak Period	7:45	--	--
PM Volume	607	1320	--
Peak Period	5:00	5:00	--
Event Peak Volume	--	671	346
Peak Period	--	7:00	12:30

For the purposes of this analysis, a 10-year time horizon was assumed, with 2% average annual growth rate for background trips. The existing trips were then converted to 2014 projections, in order to get an assessment of how traffic operations will perform several years after the complex is open. The projected background traffic is shown below in Table 5.

Table 4. Projected Peak Hour Traffic

EISENHOWER AVENUE
WESTBOUND DIRECTION

	Weekday	Friday	Saturday
AM Volume	287	--	--
Peak Period	8:30	--	--
PM Volume	1030	990	--
Peak Period	5:00	5:00	--
Event Peak Volume	--	395	414
Peak Period	--	7:00	12:00

EISENHOWER AVENUE
EASTBOUND DIRECTION

	Weekday	Friday	Saturday
AM Volume	1461	--	--
Peak Period	7:45	--	--
PM Volume	740	1609	--
Peak Period	5:00	5:00	--
Event Peak Volume	--	818	422
Peak Period	--	7:00	12:30

Using the projected background traffic data, in conjunction with the site-generated traffic volumes projected at the entrance (constrained by parking supply), a traffic model was created in SYNCRHO 6. A capacity analysis for the entrance was performed to validate the assumption that site peak-hour volumes could be accommodated by the existing traffic control (assumed unsignalized, with police direction as needed) and by the existing geometry on Eisenhower Avenue (2 through lanes in each direction – no turn bays). Several scenarios were examined (for the various schemes and for the various time periods when activities would occur.)
In all cases, the Level of Service for the eastbound and westbound directions remains at LOS A, while the entrance would be at LOS B. This conclusion is

not impacted by the selection of any particular Scheme; for any of the scenarios examined as part of this study, the difference in Level of Service is relatively negligible. A comprehensive traffic impact analysis should be performed for the selected site upon the City Council's approval.

5. Project Cost Estimate

For the purposes of this study, a preliminary magnitude-of-project-cost estimate was developed, based on the provision of all program elements, with a separate cost element for the roller rink / multi-use facility; Scheme A was used as the basis for cost development. The Preliminary Project Cost Estimate to design and construct Scheme A without a roller rink ranges between $15,630,102 and 16,745,675 (depending on the contingency allowance). This estimate assumes:

- Topographic survey, utility designation, and further geotechnical investigation
- Architectural / Engineering Design services
- Construction engineering services
- 7% inflation per year and time horizon of 2 years
- Two contingency scenarios - one at 10% and one at 20%
- Complete construction of sports facility, stadium seating, locker room building, concession building, lighting, and roadway civil elements
- If only the multi-use field (without the track), buildings, and civil elements were funded initially, the costs would be approximately $9.6 million.

A detail breakdown of each element is provided on the following pages.

All-City Sports Facility - Scheme A

Prelminary Project Cost Estimate

Track and Field	Qty	Unit Price	Est Cost	15% Overhead/Profit	Subtotal	2.00 years at 107% Annual Inflation Allowance	Construction Costs	6% A&E Design	8% Const. Eng.	Total Costs
8 lane 400m track resilient surface 49,250 sq. ft.	49,250	$35	$1,723,750	$258,563	$1,982,313	$287,237	$2,269,550	$136,173	$181,564	$2,587,287
resilient surface 1 area for field events at 19,000 sq. ft.	19,000	$35	$665,000	$99,750	$764,750	$110,812	$875,562	$52,534	$70,045	$998,141
artificial turf 225x360 field 81,000 sq. ft.	81,000	$8	$648,000	$97,200	$745,200	$107,979	$853,179	$51,191	$68,254	$972,625
artificial turf 1 D area at 19,000 sq. ft.	19,000	$8	$152,000	$22,800	$174,800	$25,329	$200,129	$12,008	$16,010	$228,147
bleachers for 2500 seats plus press box	2,500	$175	$437,500	$65,625	$503,125	$72,903	$576,028	$34,562	$46,082	$656,672
bleachers for 1500 seats	1,500	$160	$240,000	$36,000	$276,000	$39,992	$315,992	$18,960	$25,279	$360,231
4 ft. fence around track at 1480 linear ft.	1,480	$12	$17,760	$2,664	$20,424	$2,959	$23,383	$1,403	$1,871	$26,657
6 ft. fence around track and field area 950 linear ft.	950	$20	$19,000	$2,850	$21,850	$3,166	$25,016	$1,501	$2,001	$28,518
lighting 90 ft. poles	1	$250,000	$250,000	$37,500	$287,500	$41,659	$329,159	$19,750	$26,333	$375,241
scoreboard / sound system	1	$10,000	$10,000	$1,500	$11,500	$1,666	$13,166	$790	$1,053	$15,010
irrigation/cooling hookups for artificial turf	1	$2,500	$2,500	$375	$2,875	$417	$3,292	$197	$263	$3,752
subtotal track and field			**$4,165,510**	**$624,827**	**$4,790,337**	**$694,120**	**$5,484,456**	**$329,067**	**$438,757**	**$6,252,280**
Buildings*	**Qty**	**Unit Price**	**Est Cost**							**Costs**
locker room bldg. Incl. Storage/ aux. ticket booth 7,200 sq. ft.	7,200	$200	$1,440,000	$0	$1,440,000	$208,656	$1,648,656	$98,919	$131,892	$1,879,468
spectator services bldg. Incl. Storage & ticket booth at 2400 sq. ft.	2,400	$200	$480,000	$0	$480,000	$69,552	$549,552	$32,973	$43,964	$626,489
one aux. Ticket booth at 250 sq. ft.	250	$100	$25,000	$0	$25,000	$3,623	$28,623	$1,717	$2,290	$32,630
subtotal buildings*			**$1,945,000**	**$0**	**$1,945,000**	**$281,831**	**$2,226,831**	**$133,610**	**$178,146**	**$2,538,587**
Civil Elements*	**Qty**	**Unit Price**	**Est Cost**							**Costs**
Curb and Gutter Stan. Comb. 2828 linear ft.	2828	$17	$48,076	$0	$48,076	$6,966	$55,042	$3,303	$4,403	$62,748
6 inch concrete sidewalk Hyd. Cement 7100 square yards	7100	$30	$213,000	$0	$213,000	$30,864	$243,864	$14,632	$19,509	$278,005
Asphalt concrete TY.SM-9.5 600 tons	600	$45	$27,000	$0	$27,000	$3,912	$30,912	$1,855	$2,473	$35,240
Asphalt concrete TY.SM-25.0 1300 tons	1300	$40	$52,000	$0	$52,000	$7,535	$59,535	$3,572	$4,763	$67,870
9 inch reinf. Concrete pavement 3600 square yards	3600	$80	$288,000	$0	$288,000	$41,731	$329,731	$19,784	$26,378	$375,894
Aggregate base material 4800 tons	4800	$20	$96,000	$0	$96,000	$13,910	$109,910	$6,595	$8,793	$125,298
Unsuitable material disposal 1000 cubic yards	1000	$20	$20,000	$0	$20,000	$2,898	$22,898	$1,374	$1,832	$26,104
Regular excavation 61,300 cubic yards	61300	$8	$490,400	$0	$490,400	$71,059	$561,459	$33,688	$44,917	$640,063
embankment 52,000 cubic yards	52000	$3	$156,000	$0	$156,000	$22,604	$178,604	$10,716	$14,288	$203,609
retaining walls 11,500 sq. ft.	11500	$50	$575,000	$0	$575,000	$83,318	$658,318	$39,499	$52,665	$750,482
seat wall 500 sq. ft.	500	$25	$12,500	$0	$12,500	$1,811	$14,311	$859	$1,145	$16,315
handrail 1120 linear ft.	1120	$20	$22,400	$0	$22,400	$3,246	$25,646	$1,539	$2,052	$29,236
allowance			$150,000	$0	$150,000	$21,735	$171,735	$10,304	$13,739	$195,778
subtotal partial civil elements*			**$2,150,376**	**$0**	**$2,150,376**	**$311,589**	**$2,461,965**	**$147,718**	**$196,957**	**$2,806,641**
Drainage (incl. SWM Pond) at 20% of subtotal partial civil			$430,075	$0	$430,075	$62,318	$492,393	$29,544	$39,391	$561,328
Petroleum-contaminated Soil & G/W Remediation			$250,000	$0	$250,000	$36,225	$286,225	$17,174	$22,898	$326,297
Signing and Striping			$50,000	$0	$50,000	$7,245	$57,245	$3,435	$4,580	$65,259
Utility Relocation			$350,000	$0	$350,000	$50,715	$400,715	$24,043	$32,057	$456,815
Detailed Topographical Survey and Geotechnical Analysis			$150,000	$0	$150,000	$0	$150,000	$0	$0	$150,000
subtotal lump-sum civil elements*			**$1,230,075**	**$0**	**$1,230,075**	**$156,503**	**$1,386,578**	**$74,195**	**$98,926**	**$1,559,699**
SubTotal (this page)			**$9,490,961**	**$624,827**	**$10,115,788**	**$1,444,043**	**$11,559,830**	**$684,590**	**$912,786**	**$13,157,207**

Note: Buildings and Civil Elements Unit Prices include Overhead/Profit

Est Cost = Qty x Unit Price
Overhead/Profit = 0.15 x Est Cost
Subtotal = Est Cost x Overhead/Profit
Annual Inflation Allowance = (Subtotal x 1.07^2) - Subtotal
Construction Costs = Subtotal + Annual Inflation Allowance
A&E Design (Architecture & Engineering Design Plans) = 0.6 x Construction Costs
Const. Eng. (Construction Engineering - on-site inspection, testing, quality control) = 0.8 x Construction Costs
Total Costs = Construction Costs + A&E Design + Const. Eng.

All-City Sports Facility - Scheme A

Prelminary Project Cost Estimate

Primary Ball Field	Qty	Unit Price	Est Cost	15% Overhead/Profit	Subtotal	2.00 years at 107% Annual Inflation Allowance	Construction Costs	6% A&E Design	8% Const. Eng.	Total Costs
natural turf, grade and sod	1	$150,000	$150,000	$22,500	$172,500	$24,995	$197,495	$11,850	$15,800	$225,145
bleachers 150 seats	150	$125	$18,750	$2,813	$21,563	$3,124	$24,687	$1,481	$1,975	$28,143
dugouts 20x6 ft.	2	$2,500	$5,000	$750	$5,750	$833	$6,583	$395	$527	$7,505
4 ft. fence at perimeter 600 linear ft.	600	$12	$7,200	$1,080	$8,280	$1,200	$9,480	$569	$758	$10,807
gates 12 ft. wide double swing	4	$1,500	$6,000	$900	$6,900	$1,000	$7,900	$474	$632	$9,006
12 ft. fence at player area and spectators 160 linear ft.	160	$35	$5,600	$840	$6,440	$933	$7,373	$442	$590	$8,405
car protection netting 30 ft. high 240 linear ft.	240	$40	$9,600	$1,440	$11,040	$1,600	$12,640	$758	$1,011	$14,409
lighting 50 ft. poles	1	$150,000	$150,000	$22,500	$172,500	$24,995	$197,495	$11,850	$15,800	$225,145
scoreboard/sound system	1	$10,000	$10,000	$1,500	$11,500	$1,666	$13,166	$790	$1,053	$15,010
subtotal primary ball field			**$362,150**	**$54,323**	**$416,473**	**$60,347**	**$476,819**	**$28,609**	**$38,146**	**$543,574**

Secondary Secondary Ball Field	Qty	Unit Price	Est Cost							Costs
natural turf, grade and sod	1	$150,000	$150,000	$22,500	$172,500	$24,995	$197,495	$11,850	$15,800	$225,145
bleachers 150 seats	150	$125	$18,750	$2,813	$21,563	$3,124	$24,687	$1,481	$1,975	$28,143
dugouts 20x6 ft.	2	$2,500	$5,000	$750	$5,750	$833	$6,583	$395	$527	$7,505
4 ft. fence at perimeter 600 linear ft.	600	$12	$7,200	$1,080	$8,280	$1,200	$9,480	$569	$758	$10,807
gates 12 ft. wide double swing	4	$1,500	$6,000	$900	$6,900	$1,000	$7,900	$474	$632	$9,006
12 ft. fence at player area and spectators 160 linear ft.	160	$35	$5,600	$840	$6,440	$933	$7,373	$442	$590	$8,405
car protection netting 30 ft. high 240 linear ft.	240	$40	$9,600	$1,440	$11,040	$1,600	$12,640	$758	$1,011	$14,409
lighting 50 ft. poles	1	$150,000	$150,000	$22,500	$172,500	$24,995	$197,495	$11,850	$15,800	$225,145
scoreboard/sound system		$10,000	$0	$0	$0	$0	$0	$0	$0	$0
subtotal secondary ball field			**$352,150**	**$52,823**	**$404,973**	**$58,681**	**$463,653**	**$27,819**	**$37,092**	**$528,564**

Miscellaneous	Qty	Unit Price	Est Cost							Costs
Landscape plantings	1	$150,000	$150,000	$22,500	$172,500	$24,995	$197,495	$11,850	$15,800	$225,145
site furnishings - benches/bike racks	1	$20,000	$20,000	$3,000	$23,000	$3,333	$26,333	$1,580	$2,107	$30,019
misc. sports equipment	1	$20,000	$20,000	$3,000	$23,000	$3,333	$26,333	$1,580	$2,107	$30,019
subtotal miscelleaneous			**$190,000**	**$28,500**	**$218,500**	**$31,661**	**$250,161**	**$15,010**	**$20,013**	**$285,183**

Subtotal (this page)			**$904,300**	**$135,645**	**$1,039,945**	**$150,688**	**$1,190,633**	**$71,438**	**$95,251**	**$1,357,322**
Subtotal All Element Costs (Pages 1 & 2)			**$10,395,261**	**$760,472**	**$11,155,733**	**$1,594,731**	**$12,750,463**	**$756,028**	**$1,008,037**	**$14,514,528**

	Design Contingency %	Contingency	Grand Total
Contingency Based on $11,155,733	**10%**	**$1,115,573**	**$15,630,102**
	20%	**$2,231,147**	**$16,745,675**

Indoor Roller Rink / Multi-use (Elevated Structure)	Qty	Unit Price	Est Cost	15% Overhead/Profit	Subtotal	Annual Inflation Allowance	Construction Costs	6% A&E Design	8% Const. Eng.	Total Costs
square feet of inddor space	14000	$ 175	$2,450,000	$367,500	$2,817,500	$408,256	$3,225,756	$193,545	$258,060	$3,677,362
subtotal Indoor Roller Rink / Multi-use Facility			$2,450,000	$367,500	$2,817,500	$408,256	$3,225,756	$193,545	$258,060	$3,677,362

Est Cost = Qty x Unit Price
Overhead/Profit = 0.15 x Est Cost
Subtotal = Est Cost x Overhead/Profit
Annual Inflation Allowance = (Subtotal x 1.07^2) - Subtotal
Construction Costs = Subtotal + Annual Inflation Allowance
A&E Design (Architecture & Engineering Design Plans) = 0.6 x Construction Costs
Const. Eng. (Construction Engineering - on-site inspection, testing, quality control) = 0.8 x Construction Costs
Total Costs = Construction Costs + A&E Design + Const. Eng.