



City of Bowie

Regular City Council Meeting

Monday, April 4, 2022
Council Chambers - 8 p.m.

AGENDA

- I. CALL MEETING TO ORDER**
- II. PLEDGE OF ALLEGIANCE**
- III. QUORUM**
- IV. AGENDA ADDITIONS/DELETIONS/AMENDMENTS**
- V. CITIZEN PARTICIPATION**
- VI. PRESENTATIONS**
 - A. Bowie Youth Council Monthly Report
 - B. Arab-American History Month Presentation by the Diversity Committee
- VII. CITY BOARDS AND COMMITTEES**
 - A. Appointments/Reappointments/Swearing-In
- VIII. COUNCIL ANNOUNCEMENTS**
- IX. CITY MANAGER'S REPORT**
- X. CONSENT AGENDA**
 - A. Approval of March 21, 2022 Meeting Minutes
 - B. Adoption of Resolution R-9-22 Allowing for the Reduction of the Performance Security Guaranteeing Construction of Private Stormwater Management at Melford Town Center Under Permit SWM 9-18-R3
 - C. Adoption of Resolution R-10-22 Awarding a Contract to BambooHR for the Purchase of a Human Resources Management System
 - D. Adoption of Resolution R-11-22 Accepting a Bid Proposal for Bowie Golf Course Tree Removal
- XI. OLD BUSINESS**
- XII. NEW BUSINESS**
 - A. "Equity, Housing, Transit, Climate: Metropolitan Washington Planning Framework for 2030" – The Executive Director of the Metropolitan Washington Council of Governments will present to Council
 - B. Bowie Ice Arena Site Fit Presentation - At Council's request, staff was instructed to evaluate an undeveloped area at the Bowie Golf Course in which to consider for the construction of a new one-sheet ice arena. The 292 Design Group was hired to conduct a Site Fit Analysis that would include developing a conceptual site plan, conceptual floor plan, and cost estimate. City Project Manager Matt

Reno and Tom Betti of the 292 Design Group will present to Council the findings of the Site Fit Analysis

XIII. ADJOURNMENT AND MOVE TO CLOSE SESSION

To adjourn to closed session under the statutory authority of the Md. Annotated Code, State Government Article §3-305(b)(1): "To discuss the appointment, employment, assignment, promotion, discipline, demotion, compensation, removal, resignation, or performance evaluation of appointees, employees, or officials over whom this public body has jurisdiction; any other personnel matter that affects one or more specific individuals".

Note: The Ethics Commission has advised that under certain circumstances, members of the public may qualify as lobbyists when they testify before the City Council. If so, the Bowie Ethics Ordinance requires that certain information be filed with the Ethics Commission. Please review the information about lobbying that is provided with the City Clerk. If you have any questions about lobbying, please contact the Ethics Commission or the Assistant City Manager.

This meeting will be televised live on Verizon Channel 10 and Comcast Channel 71 and 996, repeated on 4/6/22 and 4/9/22 at 7:00 p.m., and [web-streamed live](#).

For a closed-captioned version of the meeting video, please go to <https://www.youtube.com/user/cityofbowiemd/playlists> and select the 2022 Council Meetings list. Once the meeting video opens, be sure to click on "CC" button to turn on closed captioning.

NEXT SPECIAL MEETING OF THE BOWIE CITY COUNCIL - MONDAY, APRIL 11, 2022 - COUNCIL CHAMBERS - 8:00 P.M.



Memorandum

TO: City Council

FROM: Shelemiah Griffiths-Johnson
Youth Council Chair

SUBJECT: Bowie Youth Council Monthly Report

DATE: 03/31/2022

Good evening Mayor Adams, Council Members, City Officials, and Constituents.
As you know, I am Chairman Shelemiah Griffiths-Johnson of the Bowie Youth Council.

On behalf of my fellow members of the BYC, I will be presenting an update on what we have accomplished this past month.

- Youth Council members continue to attend City committee meetings as time permits.
- The Youth Council is also following up on our request to get on schedule with the City Council schedule, for a meet and greet in order to establish more of a mentorship relationship with the council. We would appreciate a response from the Council on this request.
- We want to thank you all for approving our upcoming 1st ever Bowie Youth Council Townhall. We originally anticipated the date to be in March. Since our last Youth Council meeting, we voted to change the date to April 21st, 2022. We made this decision to give the anticipated changes in the COVID-19 guidelines to take effect, which will, in turn, allow us to have more attendees who have been approved for 100. We are more comfortable with the current date. Without question, each of you will receive an invitation, so please pencil in the date. We believe it will be a great opportunity for the youth to meet the City Council as well.
- The BYC Townhall subcommittee is comprised of Vice-Chair Enoch, Councilmembers Aidan, Olivia, Anabel, and myself. We are actively doing the planning for the upcoming event. This will give us an opportunity to speak directly with and involve the youth of Bowie in conversations surrounding their ideas and concerns. We do have a concern to bring to your attention. The subcommittee has been working hard. We requested that this event would be a hybrid event but due to city limitations in technology flexibility, this request could not be granted. We are truly disappointed that the city (IT and Communications) doesn't have the proper technology to facilitate this event as a hybrid event. As one of the wealthiest cities in Maryland we should be equipped with the right tools and make sure that resident tax dollars are going to areas that could enhance how best we serve our community. We are hoping this can be immediately resolved before our town hall in order to accommodate those who may want to join virtually.

Upcoming Events:

- Our first ever City of Bowie Youth Council Townhall, Youth-led on Thursday, April 21st, 2022 will be held at the Kenhill Center from 7 pm to 8:30 PM.

- The next order of business after the Youth Townhall will be the establishment of a BYC Bylaws subcommittee to create and establish bylaws for the Youth Council operations.

Thank you for your time and have a great evening.

ATTACHMENTS: None



Memorandum

TO: City Council

FROM: Awilda Hernandez, City Clerk

SUBJECT: City Committee Appointments/Reappointments/Swearing-In

DATE: 03/31/2022

Committee Appointments and Swearing-In:

1. Ms. Davina Hurt was interviewed on March 21st for appointment to the Community Outreach Committee. Council concurred to appoint her to the committee as a regular member for a 2-year term, please move to appoint her.

ATTACHMENTS: None



Memorandum

TO: City Council

FROM: Awilda Hernandez, City Clerk

SUBJECT: Approval of March 21, 2022 Meeting Minutes

DATE: 03/31/2022

ATTACHMENTS: 1. 20220404 - March 21, 2022 Meeting Minutes

REGULAR CITY COUNCIL MEETING MINUTES

MONDAY, MARCH 21, 2022

CALL MEETING TO ORDER:

The Regular Meeting of the Bowie City Council was held on Monday, March 21, 2022, in the Council Chambers at City Hall. Mayor Adams called the meeting to order at 8:02 p.m.

PLEDGE OF ALLEGIANCE TO THE FLAG:

Mayor Adams led the Pledge of Allegiance to the Flag.

QUORUM:

In attendance were Mayor Adams, Councilmembers Boafu, Esteve, Gardner (logged on at 8:08 p.m.), Harrison, and Woolfley, City Manager Lott, Assistant City Manager Mears, City Attorney Levan, City Clerk Hernandez, and Staff.

CITIZEN PARTICIPATION:

1. Milly Hall, Dunstable Ct. – Asked how would the Mayor and Mayor Pro Tem seats be filled if the current elected officials should win the seats they are running for currently.
2. Karen Williamson, Dunwood Valley Dr. – Comment attached.
3. Jeffrey Cooper, Dunwood Crossing Dr. – Commented about creating legislation to address squatters in vacant properties.
4. Rhonda Billingslea, Durham Dr. – Commented on concerns of trash and traffic on Rt. 214.

PRESENTATIONS:

Ms. Elveeda Dixon representing the Bowie Diversity Committee read excerpts on Women's History month, Irish American month and Disability month.

COUNCIL ANNOUNCEMENTS:

Mayor Adams had Chief Nesky make brief comments in regard to the disturbance that occurred at Party HQ and truancy issues at Bowie High School. Chief Nesky is meeting with owners of Party HQ this week and will inform Council of results.

Mayor Pro Tem Boafu commented that the City is due to receive \$2M from the \$1.5T dollar spending bill signed by President Biden. These funds will be earmarked for the upgrades to the City's water lines.

Councilmember Woolfely responded to the question Ms. Hall asked during Citizen Participation. The remaining Councilmembers would interview potential candidates and appoint to fill the vacancies for the duration of the term.

Councilmember Harrison mentioned that she attended a meeting with WSSC along with Councilmember Gardner to discuss the possibility of them servicing the City owned water lines and would like to have staff proceed with having WSSC attend one of Council's meetings in April to have further discussions.

CITY MANAGER'S REPORT:

City Manager Lott reported that the pilot community workforce initiative that was adopted by Council will be incorporated in the phase II of the water system repair and the annual street paving contracts. He also briefed Council on the 3.5-mile plan for the phase II repairs to the city's water lines which is now in the design phase and should be completed by mid-June 2022. An RFP will be sent out at the end of June and it will take about 45 days from beginning to end of the RFP process. Construction should begin in mid-September 2022 and should be completed in 9-10 months.

CONSENT AGENDA:

Mayor Pro Tem Bofo made a motion to approve Consent Agenda items: A) Approval of March 7, 2022 Meeting Minutes; B) Adoption of Resolution R-8-22 Approving Departure BD-4-21, a Request by Green Branch, LLC and GBR Mill Branch, LLC for Departure From Section 27-558(a) of the Prince George's County Zoning Ordinance to Permit a Reduction in the Dimensions of Standard-Sized Perpendicular Parking Spaces From 9.5 Feet by 19 Feet to 9.0 Feet by 18 Feet for the Multi-Family and Townhouse Sections of Mill Branch Crossing Proposed in Detailed Site Plan #DSP-20003. Councilmember Woolfley seconded the motion. Motion passed 6-0.

NEW BUSINESS:

A. Presentation on Tanglewood Park from City's MAPS Subcommittee - Mr. Bill Lussier, member of the MAPS Subcommittee presented to Council concepts the subcommittee would like Council to take into consideration in order to be able to re-designate Tanglewood Park as a City park. Volunteers have taken the initiative to clean up some of the old trails to make them usable again and their goal is to preserve the primitive nature and natural beauty of the park.

Mayor Pro Tem Bofo asked City Manager Lott what the process would be to re-designate the park as a City park. City Manager Lott responded that Council would have to provide guidance to do so and a 3-year CIP project would have to be phased into the budget to allow for any type of repairs or upgrades.

Councilmember Harrison asked if there were any other grants available besides from the state or federal level. City Manager Lott responded that there are some that the City can apply for through Department of Natural Resources and Maryland Department of the Environment, he will have staff from the Grants Department look into them.

B. Excalibur Road Traffic Complaints and Concerns – Mayor Pro Tem Bofo commented that he has received complaints from several residents with concerns on the amount of cars that are speeding on Excalibur Road and would like for Council to consider adding speed barriers on that road to discourage the speeding.

Public Works Director, Mr. Jose Aldayuz explained that Excalibur Road does not meet the criteria for speed barriers and suggest that the Police Department could probably install speed cameras on that road to discourage the speeding.

March 21, 2022

Council concurred to have the Police Department focus on speed control with speed cameras since Excalibur does not meet the criteria for speed barriers.

ADJOURNMENT:

Mayor Pro Tem Boafo motioned to adjourn the Regular City Council meeting. Councilmember Gardner seconded the motion. Motion passed 6-0. The meeting adjourned at 9:22 p.m.

Respectfully submitted,

Awilda Hernandez, MMC
City Clerk

Karen Williamson
14206 Dunwood Valley Drive, Bowie, Md 20721
202-492-4775

March 19, 2022

Reference: A citizen participation letter

Dear City Councilmembers and Bowie City Staff,

I am sending this letter to address my concern and to be on record.

I have had the privilege to live in a wonderful residential community in the city of Bowie. I have had the privilege of living in a community where my growing children could walk the roads and experience a safe environment to play basketball, ride bikes, make lifelong friendships and develop their transitions to adult life. I have had the privilege of being in a housing residential community of like-minded residents who have extreme pride in their homestead and who have invested in the maintenance and enhancement of the community.

I am Karen Williamson, an owner of a home in Woodmore Highlands community, district 3. I have lived in the community for over 20 years. My husband and I knew we had found the “Camelot” of our time for our family when we moved to Woodmore Highlands, and we knew we were blest. Through the years we have been the benefactors of having good family structured relationships with our neighbors. We share information and resources to keep our lives running. At times, the older children of the neighborhood had been the babysitters to the smaller ones during school weeks while the parents had to work outside of the community to maintain the cost and expectations of being homesteaders. My home has been the residence to my husband, our children, our grandchildren, and me. Community is everything and Bowie has been a haven of most things good in a community.

I started by telling you about many things “good” in my community life here in Woodmore Highlands first to set your mind around what I have considered to be a dream life. But in 2018-2022, I have had to live in a nightmare that I would have never been able to dream of in my wildest dream. I had been a resident that has had to live with a SQUATTER issue right next door to my estate home. It has been one of the most anxious times of my community life. It has been a time of simply feeling a lack of safety even within my home; not to mention the coming and going from my home. I have experienced feeling overprotective of visitors at my home and praying that an incident did not cause harm to anyone visiting us. Yes, ONE home caused mayhem for all the surrounding neighbors. We lived with this daily feeling of threat for over two years. Today, I want to share with you a few of the events and actions we experienced:

- We experienced the shock of learning that someone(s) had taken over the residence of 14208 Dunwood Valley Dr.
- We experienced daily watching of that home to be sure we were not outside if we saw someone in the driveway of the home.
- We experienced seeing a cord or cabling running straight out the cable utility box into the home of 14208 Dunwood Valley Dr, this was not normal for any of our neighboring homes.

- We experienced watching many cars coming and going from the residence at 14208 Dunwood Valley Dr, which was very suspicious because the durations of visits were minutes.
- We experienced our Woodmore Highlands HOA seek getting us help to secure our safety in our homes which reside near the home of 14208 Dunwood Valley Drive. Our Architectural Committee chairman shared regular updates with us to explain that the HOA leadership was not able to secure the home, and that the foreclosing Bank owners were out of touch and reach of our leadership to get them to address and secure the home at 14208 Dunwood Valley Drive.
- We experienced seeing the squatters being removed from the home at 14208 Dunwood Valley Dr. in handcuffs. The squatters had barking dogs that sounded very aggressive and frightening, which were removed by Bowie Animal control. Please understand that even walking by that home was a fear. The squatters returned within days and removed the boards from the windows and front door. I must add that the dogs were allowed outside at late night hours, I recall this because of the loud barking at very early morning hours.
- We experienced the home of 14208 Dunwood Valley Dr being boarded up like a condemned building in a blighted area of urban decline. Driving by the home was a feeling of shame and despair. I sometimes felt teased when others of the home residences offered condolence.
- We experienced while sitting on the deck during one of the best days of the spring listening to a small child screaming to the top of her voice and the sounds of those aggressive dogs barking and growling at the child. Our hearts dropped, I stopped in a paralyzing moment, just frozen; my husband did not hesitate to call 911 for a child safety and wellbeing check at the 14208 Dunwood Valley Dr. We remained outside to listen and if in normal circumstances, we would have run over to the residence to assist; but we did not know what to expect and we felt fearful. When the Bowie police checked at the home of 14208 Dunwood Valley Dr. for the child wellness, we watched from the deck. The police returned afterward to our home to report that they did not find a harmed child. Did the police see the child, we will never know?
- I personally watched one day to see who was leaving the home of 14208 Dunwood Valley Dr, only to see a rear car tag frame that displayed the wording of my sorority's name. Talk about being very ashamed and embarrassed. I search my sorority directory for any address of this location, but I did not find such. Believe me, this was still a very low day for me.

Enough said of my experiences of the past. The residence of 14208 Dunwood Valley Dr now has a new homeowner. A young family to look forward to a great experience living in a wonderful community of homesteaders. What does the new homeowner deserve for their hard-earned dollars and the city that provide governance?

I call upon the city manager with the city staff, the City Councilmen, and the Mayor to make formable changes in the way that foreclosed properties are managed in the city. Our residents deserve to know that its leaders either hired, elected, or appointed can created an environment where property assets are cared for and are expected to answer to maintenance of safety and security. We need legislation, we need to set a precedence, and we need collective accountability. The banks and their serving agencies must be responsible for the safety and security of foreclosed homes. Residents deserve better. The City of Bowie deserves better. There are models that exist in Maryland governance for such issues and matters. We need our City of Bowie to support a record change.

Thank you for your time and consideration.

Sincerely,

Mrs. Karen Williamson

Resident at Woodmore Highland Community

Cc:

Mayor, City of Bowie, Honorable Tim Adams
District 3, City of Bowie, Councilman Adrian Boafo
District 2, City of Bowie, Councilman Dufour Woodley
District 4, City of Bowie, Councilman Roxy Ndebumadu
Member at Large, City of Bowie, Councilman Ingrid Harrison
Member at Large, City of Bowie, Councilman Henri Gardner
City Manager, City of Bowie, Mr. Alfred Lott
Assistant City Manager, City of Bowie, Mr. Daniel Mears
City Clerk, City of Bowie, Awilda Hernandez
Woodmore Highland President, Mrs. JoAnn Marshall-Hobbs



Memorandum

TO: City Council

FROM: Alfred Lott, City Manager

SUBJECT: Bond Reduction, Melford Town Center, SWM 9-18-R3
Resolution R-9-22

DATE: 03/31/2022

St. John Properties, Inc., the developer of Melford, has submitted a request to the Public Works Department for a performance bond reduction for permit SWM 9-18-R3 covering the construction of the private stormwater facility on the above referenced project.

The Public Works and Planning Directors have certified that a minimum of 80% of the work covered by the referenced permit has been completed in accordance with approved plans. All other conditions associated with performance bond reduction have been met in accordance with the City of Bowie Code Chapter 22, Section 22-30(c).

I concur with the above recommendation and request your approval of Resolution R-9-22.

ATTACHMENTS: 1. 20220404 - Resolution R-9-22 rev1

RESOLUTION
OF THE COUNCIL OF THE CITY OF BOWIE, MARYLAND
ALLOWING FOR THE REDUCTION OF THE PERFORMANCE SECURITY
GUARANTEEING CONSTRUCTION OF PRIVATE STORMWATER
MANAGEMENT AT MELFORD TOWN CENTER UNDER PERMIT SWM 9-18-R3

WHEREAS, the developer, St. John Properties, Inc., provided a performance security in the amount of \$456,875 for permit number SWM 9-18-R3 to complete construction of a private stormwater management facility; and

WHEREAS, the City of Bowie Directors of Public Works and Planning have certified that a minimum of 80% of the work required by the subject permit has been completed according to plans and specifications; and

WHEREAS, in accordance with Chapter 22, Section 22-30(c), of the Bowie City Code, all requirements for bond reduction have been fulfilled and the new performance bond amount is set at \$365,500.

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Bowie, Maryland, that the City does hereby authorize the reduction of the performance security on the above referenced permit to an amount not less than \$365,500.

INTRODUCED AND PASSED by the Council of the City of Bowie, Maryland at a meeting on April 4, 2022.

ATTEST:

THE CITY OF BOWIE, MARYLAND

 Awilda Hernandez
 City Clerk

 Timothy J. Adams
 Mayor



Memorandum

TO: City Council

FROM: Alfred Lott, City Manager

SUBJECT: Resolution R-10-22 for Human Resources Management System

DATE: 03/31/2022

In the FY 2022 Budget, Council approved a \$47,000 allocation in order for the City of Bowie to obtain the services of a qualified vendor to implement and maintain a comprehensive human resources management system ("HRMS"). The system will allow for increased efficiency of all human resources-related processes such as employee records, training, applicant tracking, onboarding and offboarding processes as well as several other key functions.

The Request for Proposals for this service was posted for ten days, closing on March 24, 2022. Since that time, staff has determined that based on the overall quality of the proposal, the completeness in which their product satisfies the requirements included in the RFP, the overwhelmingly positive referrals from existing clients, and the experience of the company, we find the HRMS proposed by BambooHR of Lindon, Utah to be an excellent product for our needs. This company has provided similar services for several municipalities similar to the City of Bowie around the country. The annual fee for initial implementation and monthly maintenance is \$46,000.

Completion of this project is an extremely important task for the Human Resources Office in FY 2022, as it will streamline the human resources processes and allow the human resources team to provide more efficient HR support to all City departments. As such, staff recommends that the City Council authorize the City to enter into an agreement with BambooHR to implement and maintain a state of the art and high-efficiency HRMS.

ATTACHMENTS: 1. 20220404 - Resolution R-10-22

RESOLUTION
OF THE COUNCIL OF THE CITY OF BOWIE, MARYLAND
AWARDING A CONTRACT TO BAMBOOHR FOR THE PURCHASE OF A
HUMAN RESOURCES MANAGEMENT SYSTEM

WHEREAS, the FY22 Professional Services budget of the Human Resources Office allows for the purchase, implementation and monthly maintenance of a Human Resources Management System; and

WHEREAS, a Request for Proposals was issued with a closing date of March 24, 2022; and

WHEREAS, upon review staff has determined that based on the overall quality of the proposal, the overwhelmingly positive referrals from existing clients, and the experience of the company, we find the HRMS proposed by BambooHR of Lindon, Utah to be an excellent product for our needs.

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Bowie, Maryland that the City Manager is hereby authorized to enter into an agreement with BambooHR in the amount of \$46,000 for the purchase and implementation of a Human Resources Management System.

INTRODUCED AND PASSED by the Council of the City of Bowie, Maryland at a meeting on April 4, 2022 by a vote of at least two-thirds of the members of the Council.

ATTEST:

THE CITY OF BOWIE, MARYLAND

Awilda Hernandez
City Clerk

Timothy J. Adams
Mayor



Memorandum

TO: City Council

FROM: Alfred Lott, City Manager

SUBJECT: Contract Award, Bowie Golf Course Tree Removal Project
Resolution R-11-22

DATE: 03/31/2022

A legal notice advertising a Request for Bids (RFB) for Bowie Golf Course Tree Removal Project was placed on eMaryland Marketplace and on the City's website on March 11, 2022. Bids were received from the following firms on March 29, 2022:

Ballard Enterprises Crownsville, MD	\$250.00 / crew hour
Greenleaf Tree Service Bowie, MD	\$187.50 / crew hour
McKenzie Contracting St. Leonard, MD	\$250.00 / crew hour
Shy Tree Services Jessup, MD	\$255.00 / crew hour

The bids were evaluated as required by City Charter and the Procurement Policy. Criteria for selection included the firm's experience, qualifications, timeline, fee schedule and understanding of the City requirements.

After careful review, it was determined that Greenleaf Tree Service of Bowie, MD had submitted the most responsive and responsible bid in the amount of \$187.50 / crew hour. Parks & Grounds FY22 budget allows for \$60,000 for this project.

I concur with the above recommendation and request your approval of Resolution R-11-22.

ADL/SH/rj

ATTACHMENTS: 1. 20220404 - Resolution R-11-22

RESOLUTION
OF THE COUNCIL OF THE CITY OF BOWIE, MARYLAND
ACCEPTING A BID PROPOSAL FOR
BOWIE GOLF COURSE TREE REMOVAL

WHEREAS, pursuant to Section 61 of the City Charter, a Request for Bids was issued on eMaryland Marketplace and on the City's website for a Bowie Golf Course Tree Removal project; and

WHEREAS, on the March 29, 2022 due date, the City received four (4) bids; and

WHEREAS, the bids were evaluated as required by City Charter and the Procurement Policy; and

WHEREAS, after careful evaluation and review of the bids submitted, it was determined that Greenleaf Tree Service of Bowie, MD had submitted the most responsive and responsible bid.

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Bowie, Maryland, that the Council hereby accepts the proposal of Greenleaf Tree Service of Bowie, MD and authorizes the City Manager to enter into a contract with Greenleaf Tree Service, in the amount of \$60,000.

INTRODUCED AND PASSED by the Council of the City of Bowie, Maryland at a meeting on April 4, 2022.

ATTEST:

THE CITY OF BOWIE, MARYLAND

Awilda Hernandez
City Clerk

Timothy J. Adams
Mayor



Memorandum

TO: City Council

FROM: Alfred Lott, City Manager

SUBJECT: "Equity, Housing, Transit, Climate: Metropolitan Washington Planning Framework for 2030"

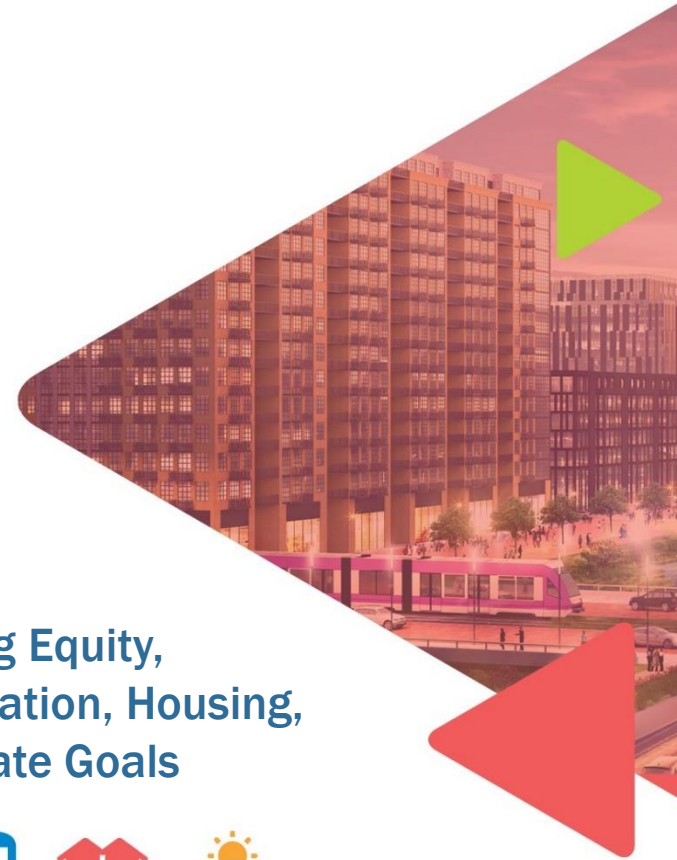
DATE: 03/31/2022

The Executive Director of the Metropolitan Washington Council of Governments will present to Council.

ATTACHMENTS: 1. 20220404 - MWCOG Presentation

REGION UNITED

Metropolitan Washington Planning Framework for 2030

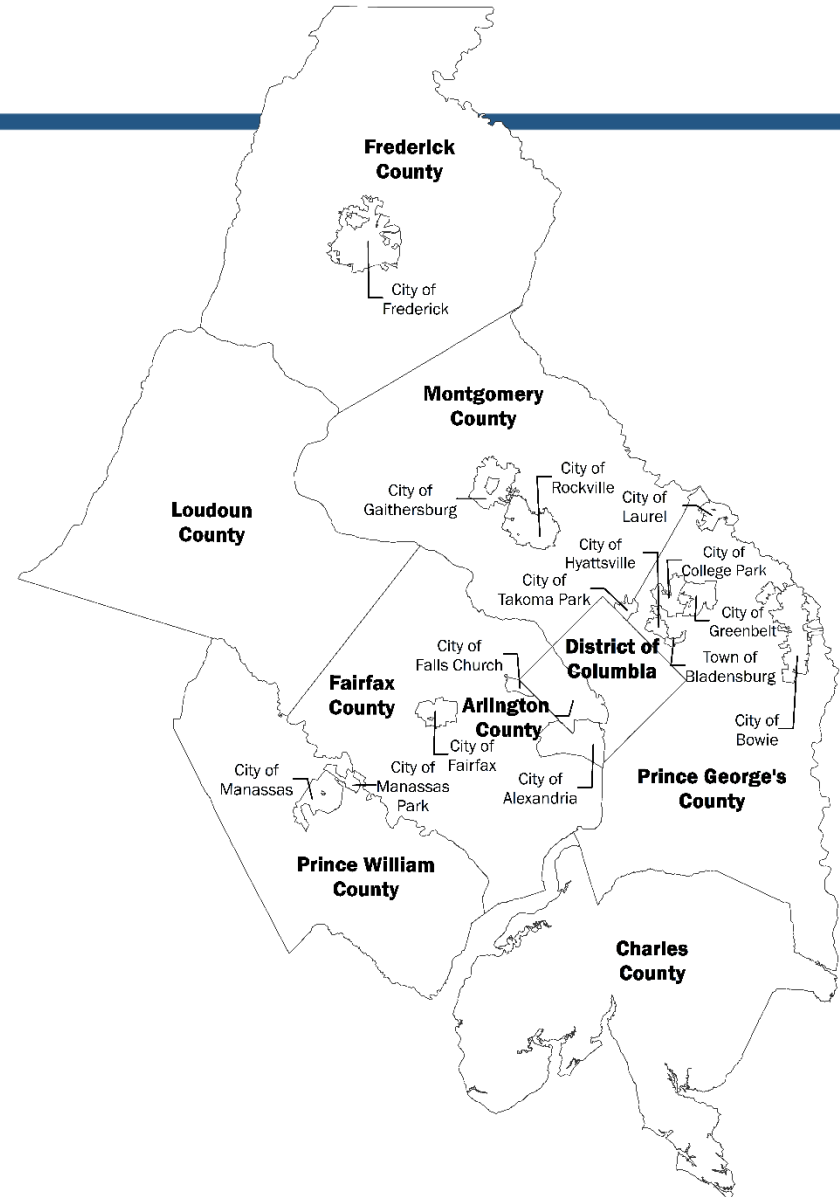


Advancing Equity,
Transportation, Housing,
and Climate Goals

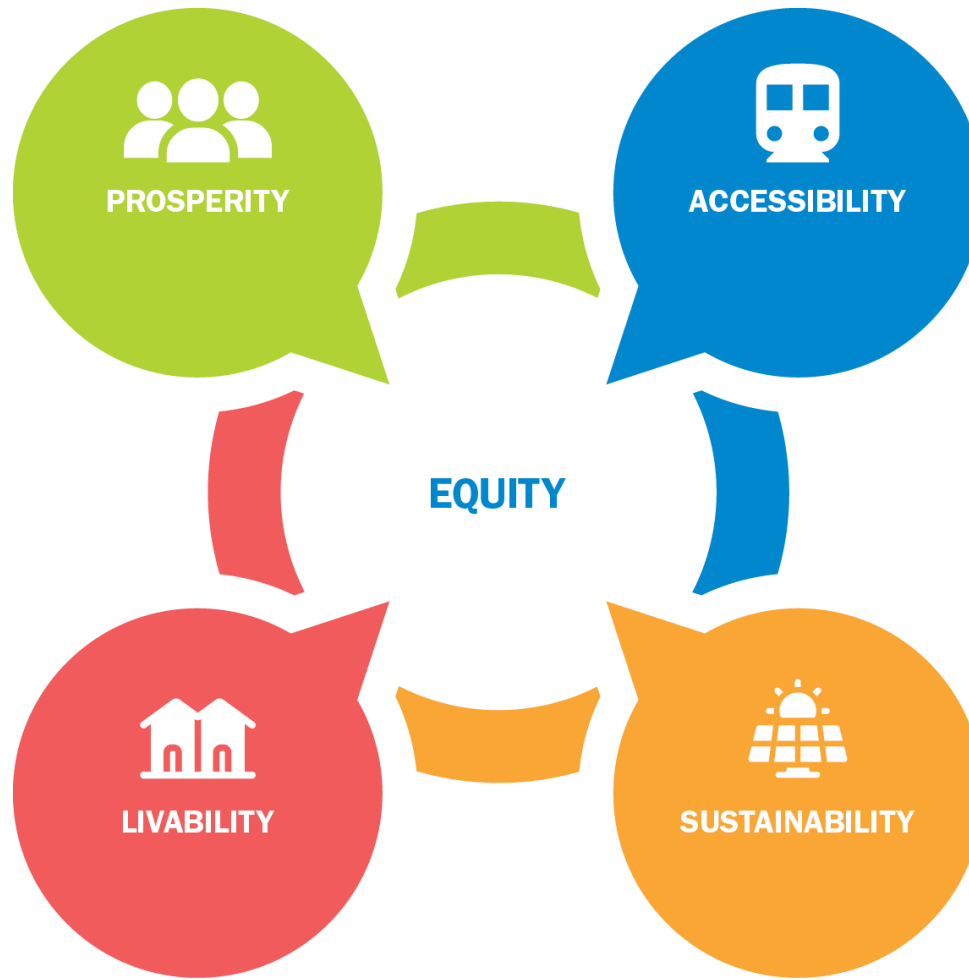


About COG

- An independent, nonprofit association founded in 1957.
- Brings area leaders together to address regional issues.
- 300 elected officials from 24 local governments, the Maryland and Virginia state legislatures, and U.S. Congress.
- Home of the TPB, the region's Metropolitan Planning Organization.
- 125+ staff.



Region Forward Vision



Regional Mojo

Over the last decade, our region's achievements include:

- Unprecedented cooperation on economic development
- Historic investments in transit
- National recognition for walkable communities
- Significant air quality improvements



COG Board Planning Priorities

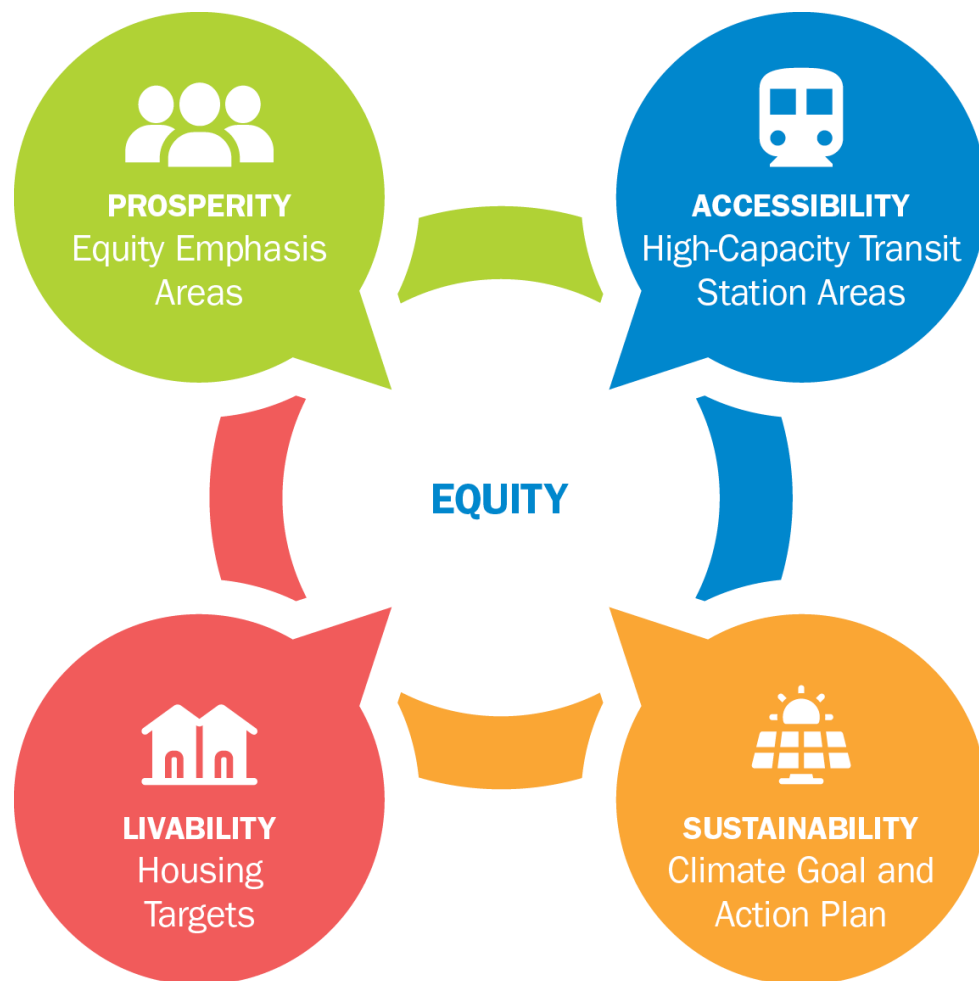
“If the challenges are interrelated, so are the solutions.”

1. Housing Targets (2019)
2. Climate Goal & Action Plan (2020)
3. High-Capacity Transit Station Areas (2021)
4. Equity Emphasis Areas (2021)

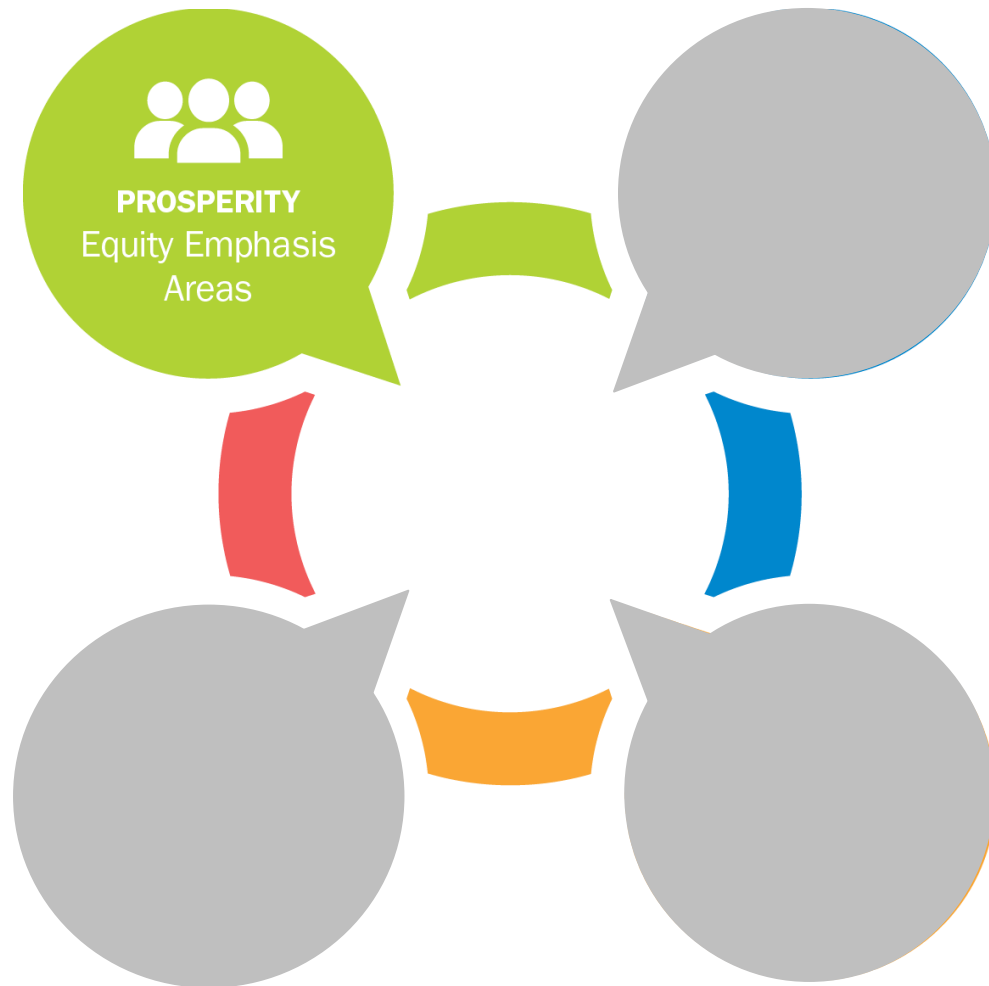


West Falls Church rendering (WMATA)

Framework for 2030



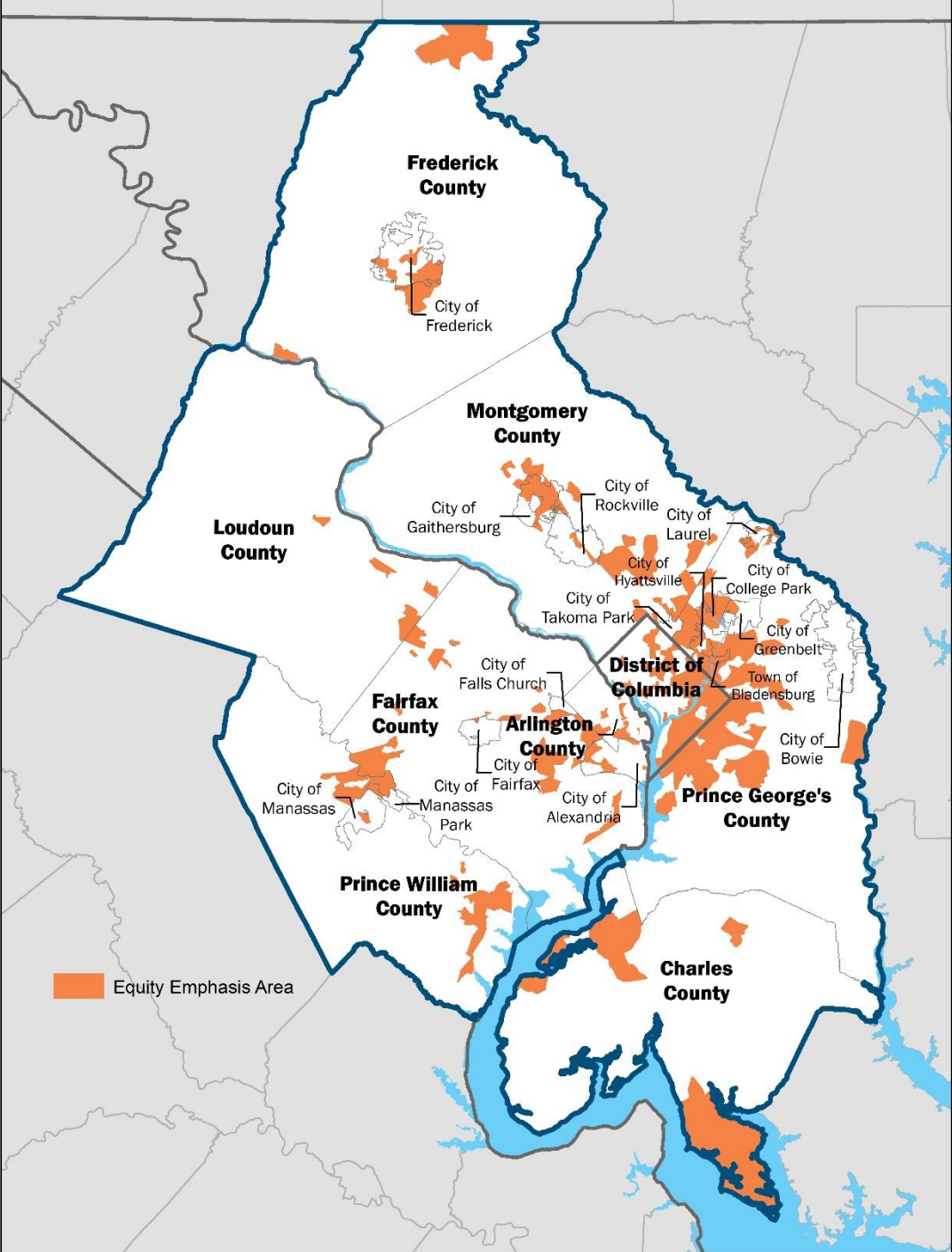
Advancing Shared Prosperity



Elevate 350 Equity Emphasis Areas (EEAs)

Areas with high
concentrations of
underserved residents.

mwcog.org/equityemphasisareas



Equity Emphasis Area

Broader Application of EEAs

- EEAs to be used broadly in local/regional planning activities:
 - Housing
 - Community Planning
 - Health
 - Public Safety
 - Transportation
 - Climate and Energy
 - Education
 - Economic Opportunities



Virginia Commonwealth University: Health Equity Brief for COG

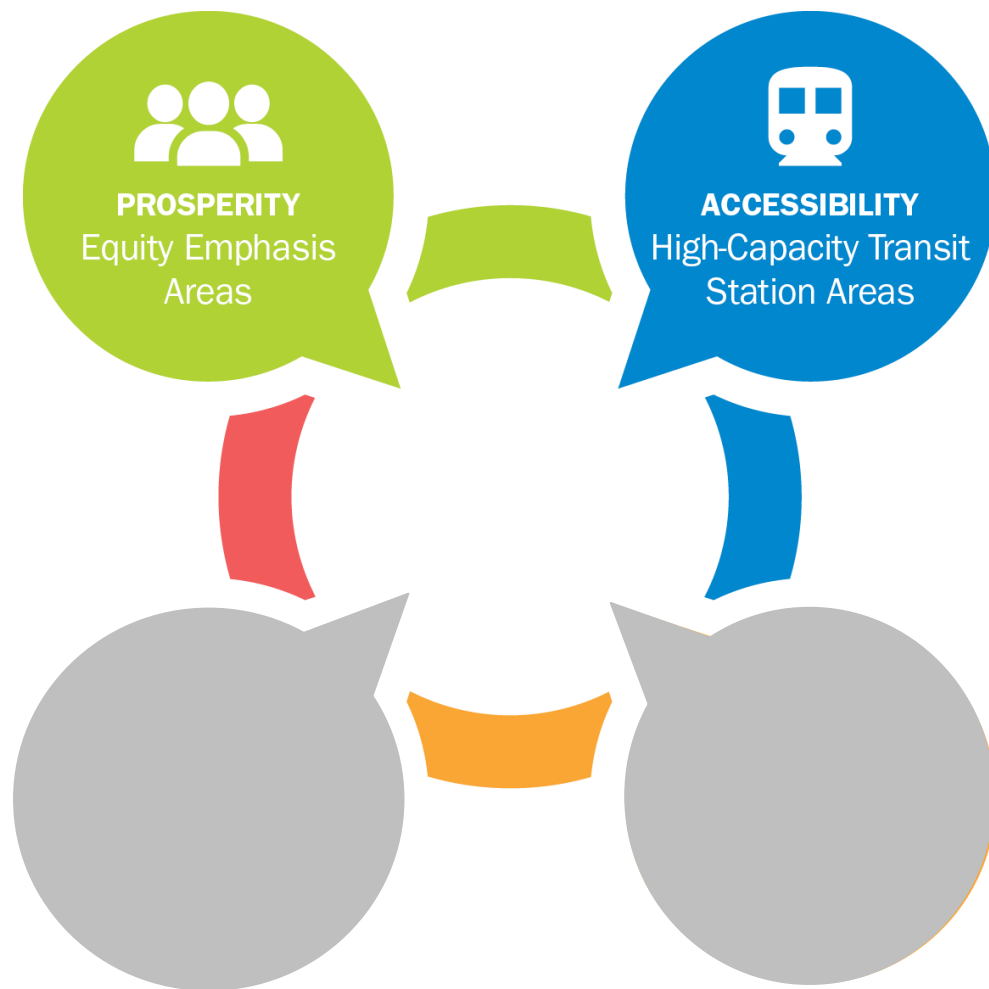


EEAs/Montgomery County

- Montgomery County application of EEAs
 - Capital Improvement Program (CIP) budget
 - prioritizes projects
 - Green Bank
 - Shovel Our Sidewalks Act
 - Transit access planning (Purple Line)



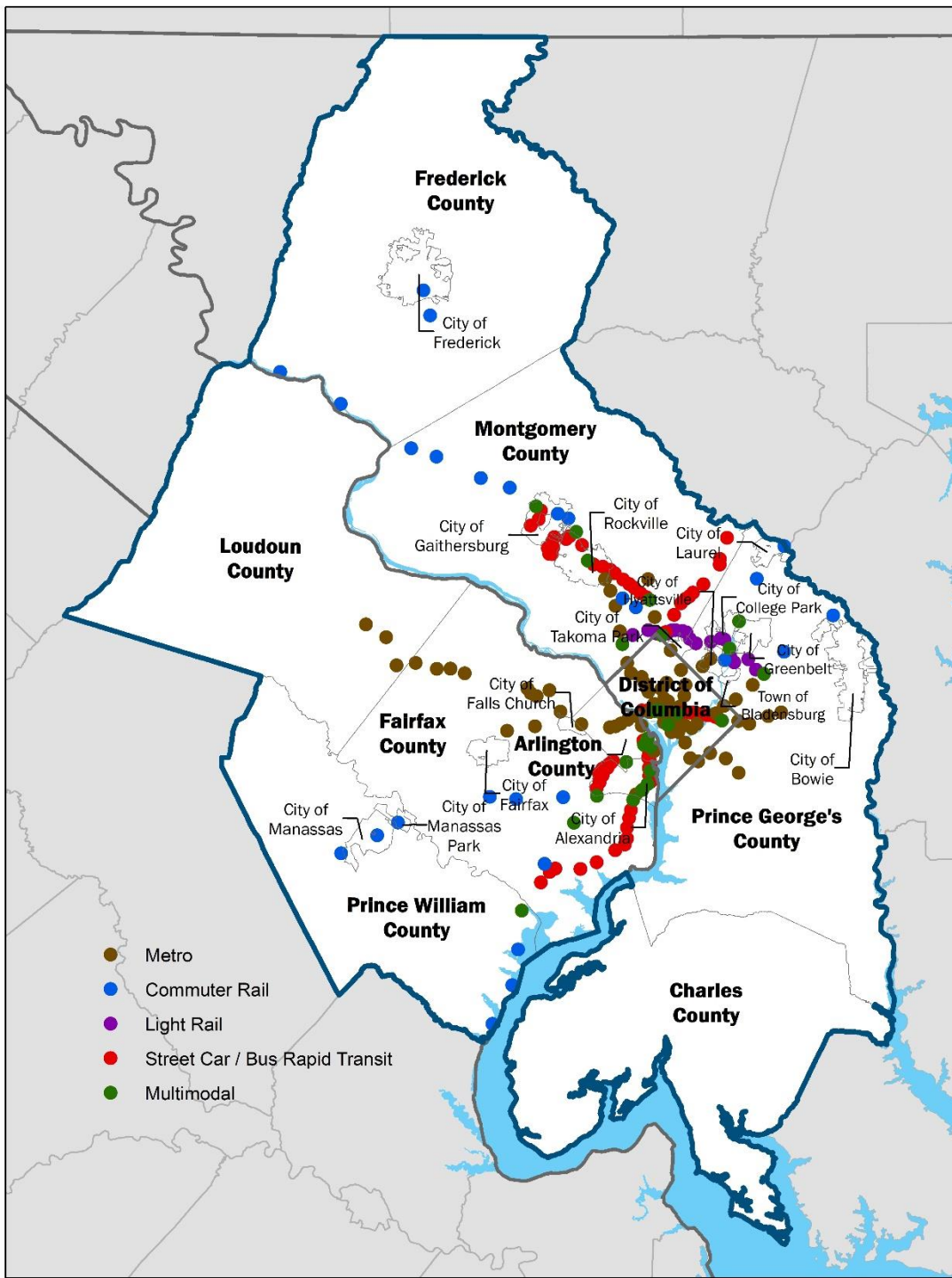
Advancing Accessibility



Optimize 225 High-Capacity Transit Station Areas (HCTs)

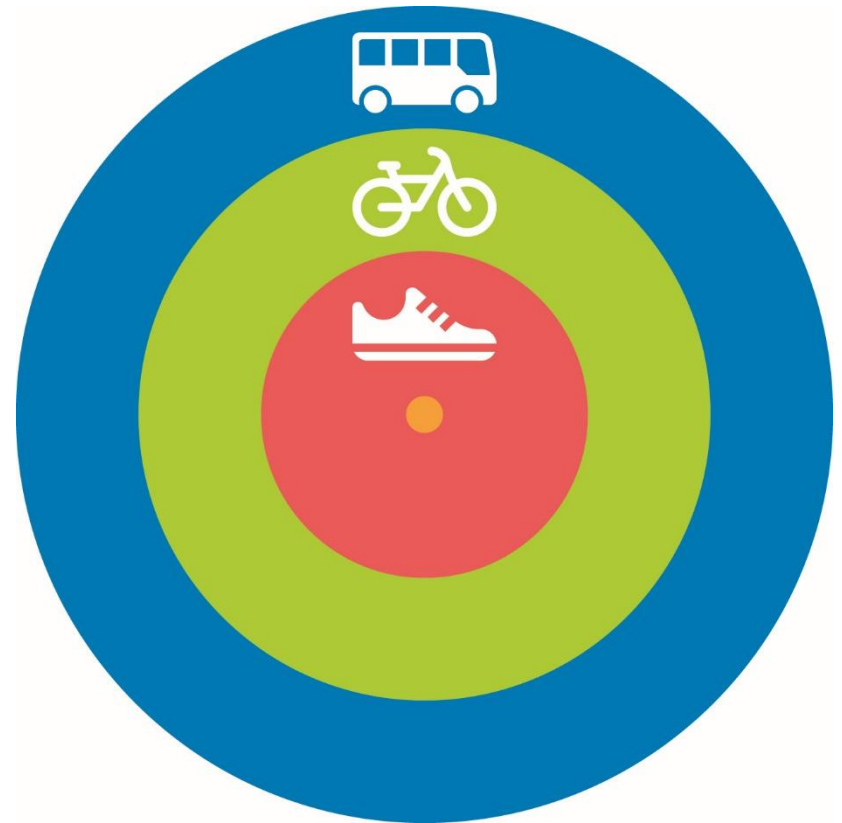
Locations around Metrorail, Commuter Rail, Light Rail, Bus Rapid Transit (BRT), and Streetcar.

mwcog.org/highcapacitytransit

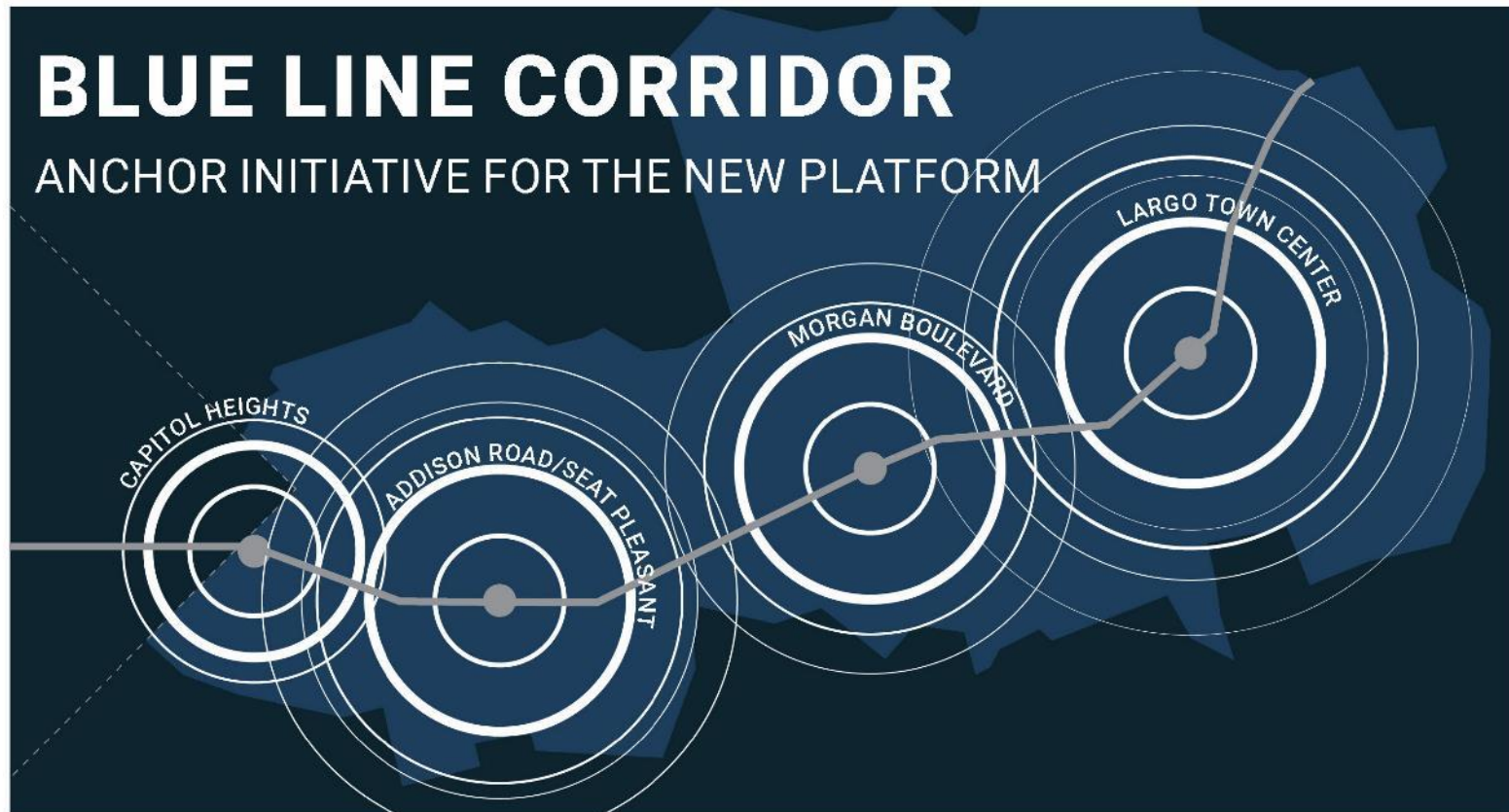


Optimize HCTs = Transit-Oriented Communities

- Enhance land use around stations:
 - Housing, offices, and shopping.
- Improve access to stations and nearby amenities:
 - Pedestrian and bicycle projects.
 - Bikeshare, e-scooter.
 - Microtransit services.

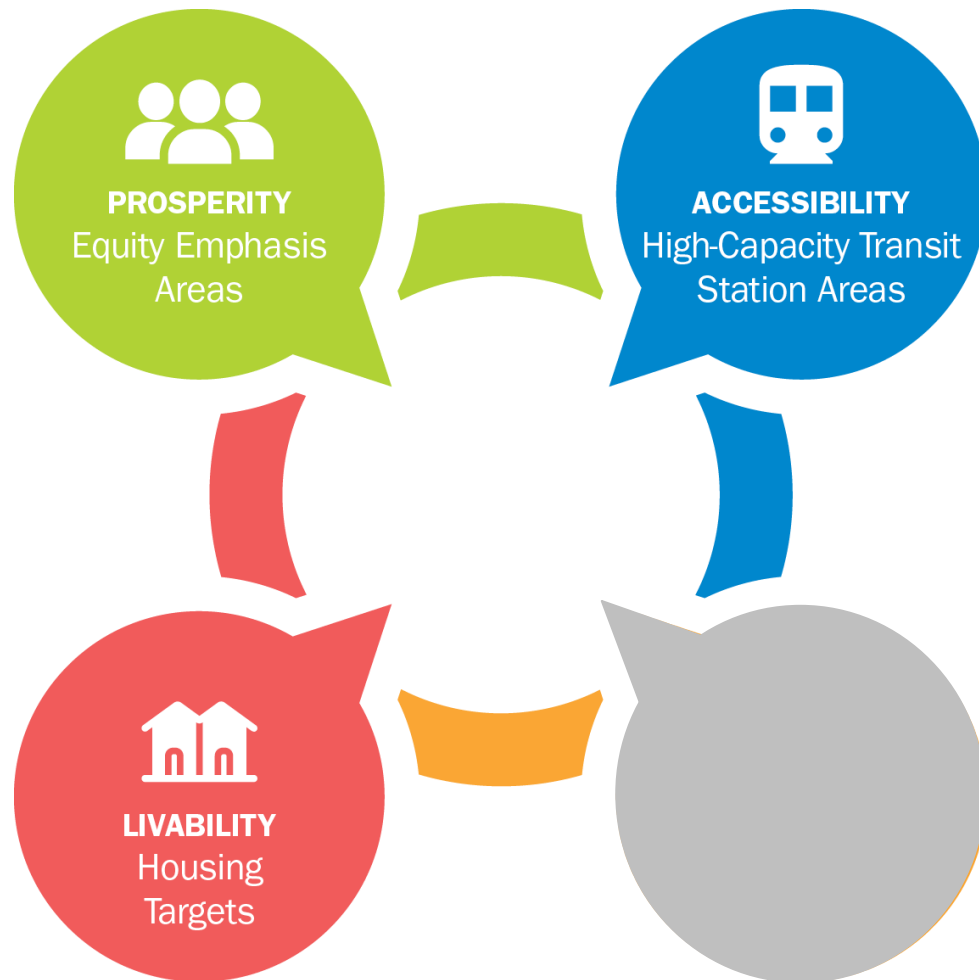


HCTs/Prince George's County



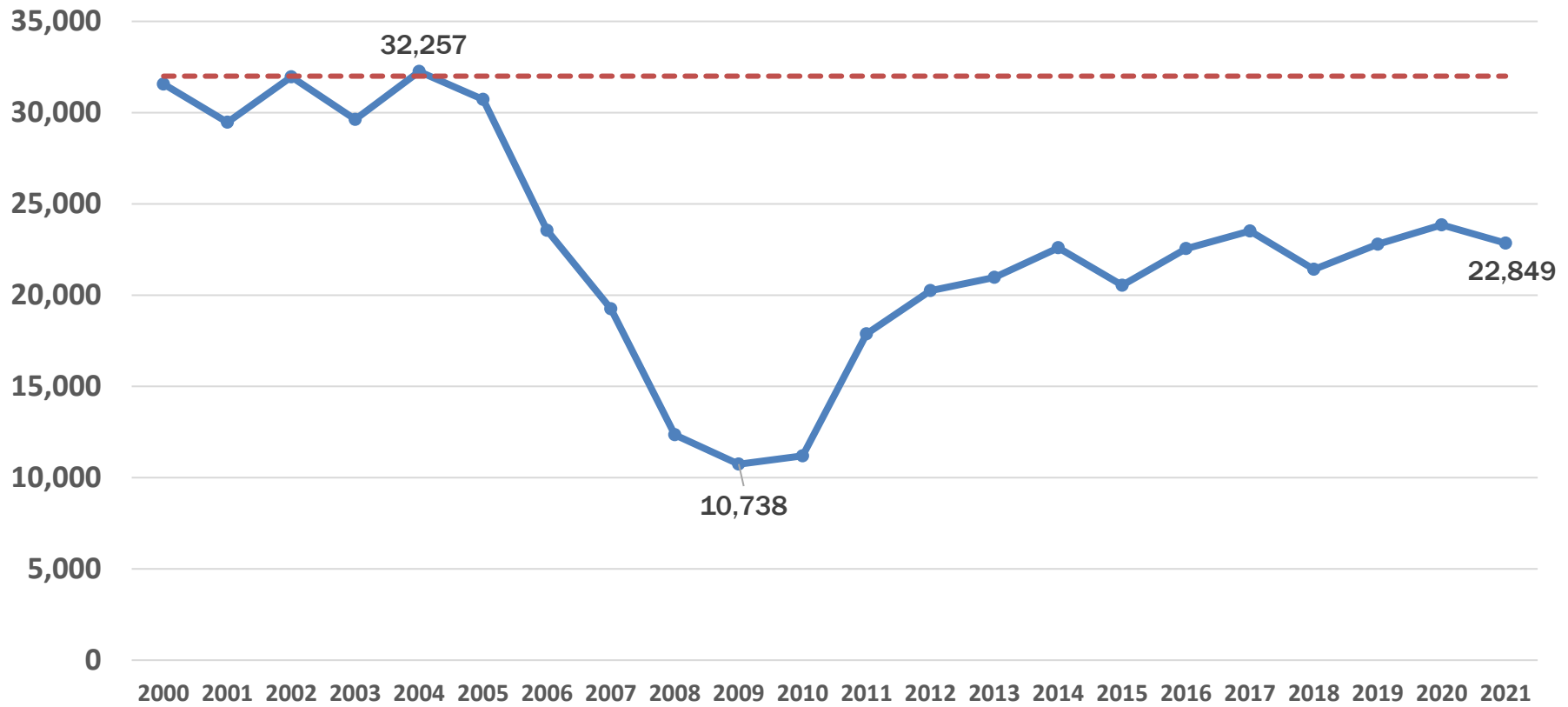
Blue Line Corridor (Prince George's County)

Advancing Livability

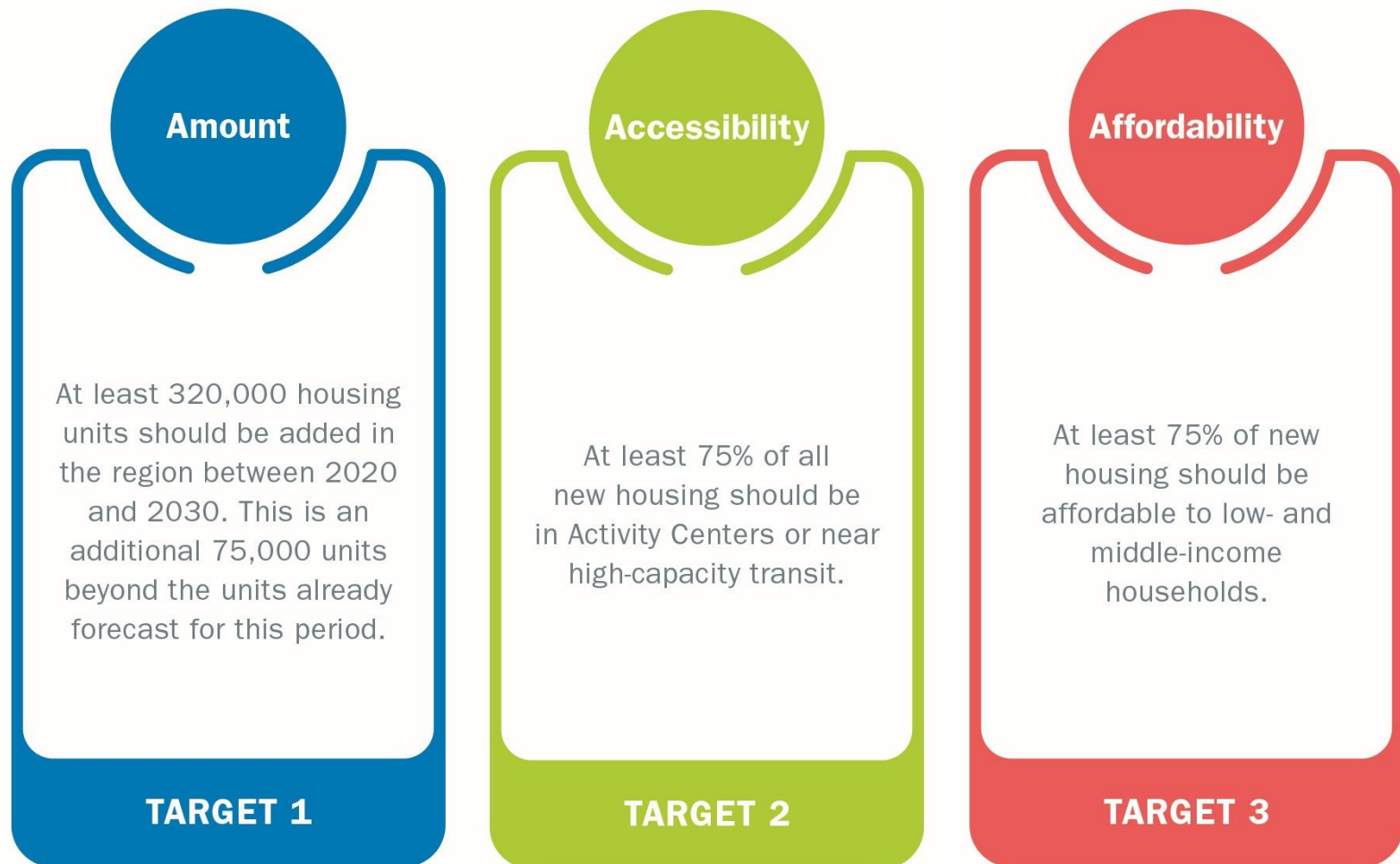


The Region Still Needs More Housing

Total Housing Units Authorized by Building Permits
by Year In Metropolitan Washington



Regional Housing Targets



Housing Targets/D.C. & Alexandria

- District of Columbia
 - Mayor's Order on housing – 36K new units by 2025
- City of Alexandria
 - Adoption of regional share of housing targets - 11,500 new units by 2030



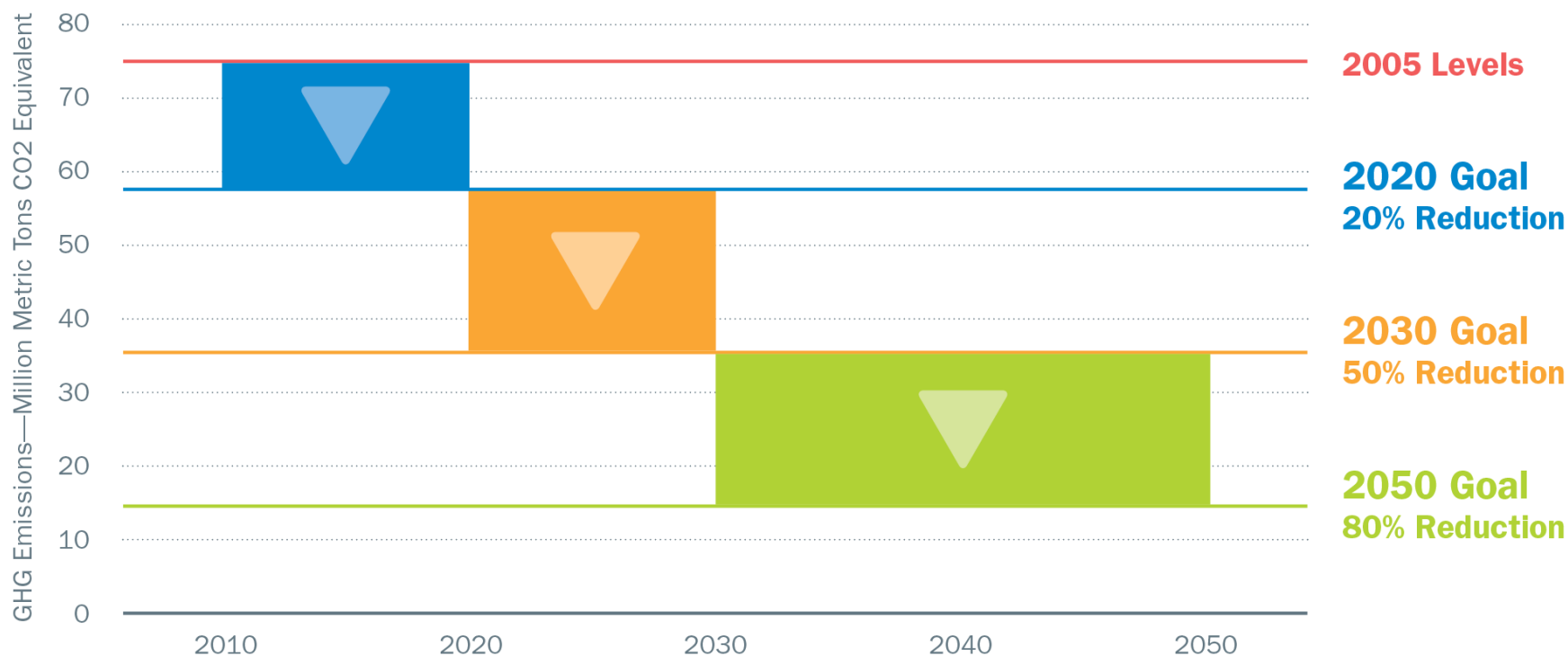
The Residences at St. Elizabeths East (Flaherty & Collins Properties)

Advancing Sustainability

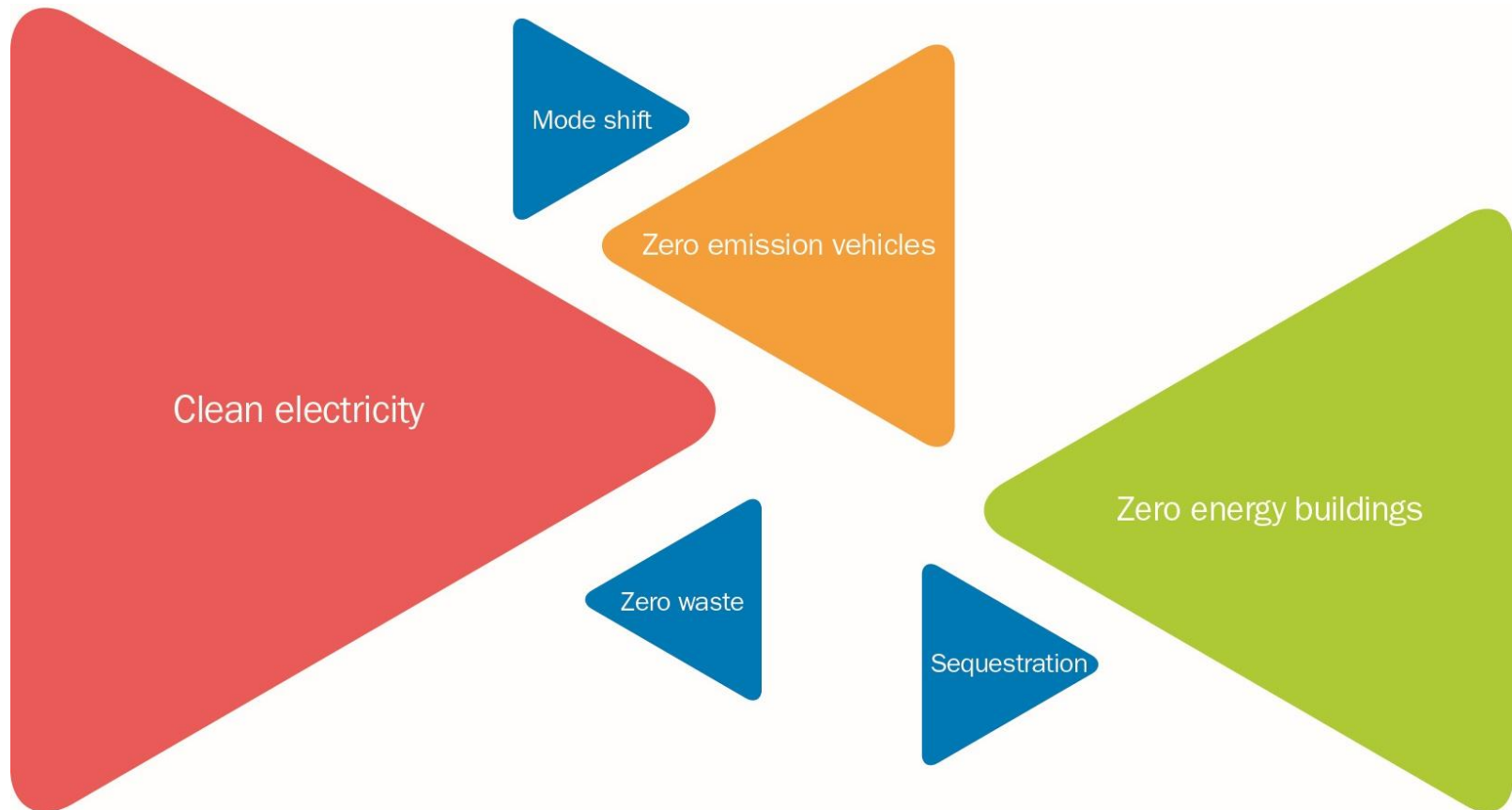


Regional Climate Goals

Metropolitan Washington GHG Emissions Reduction Goals

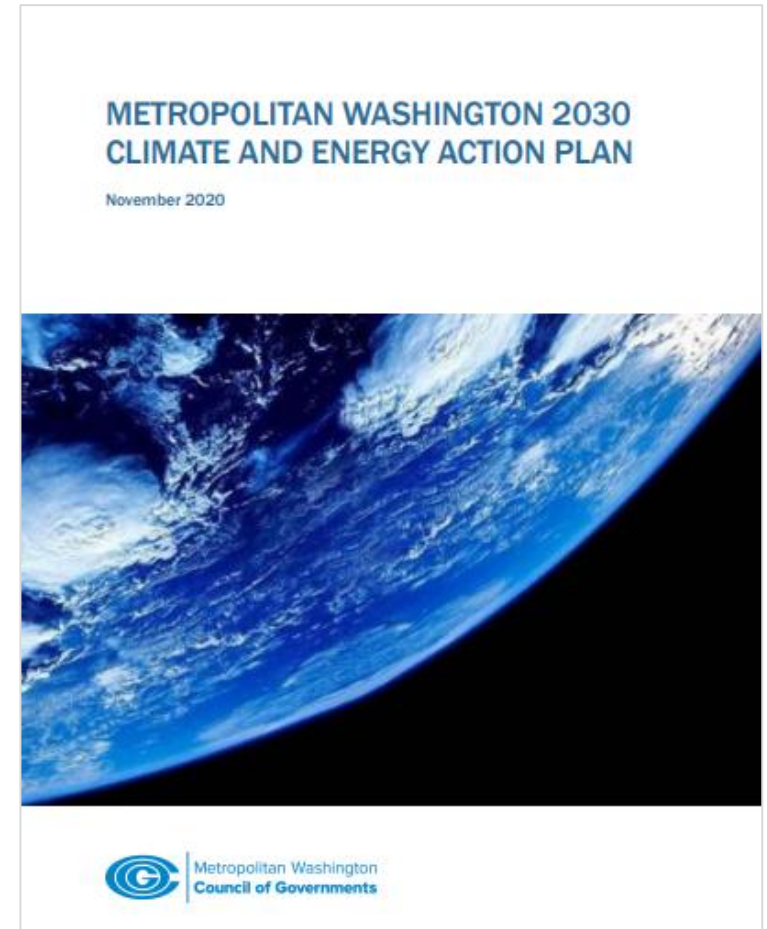


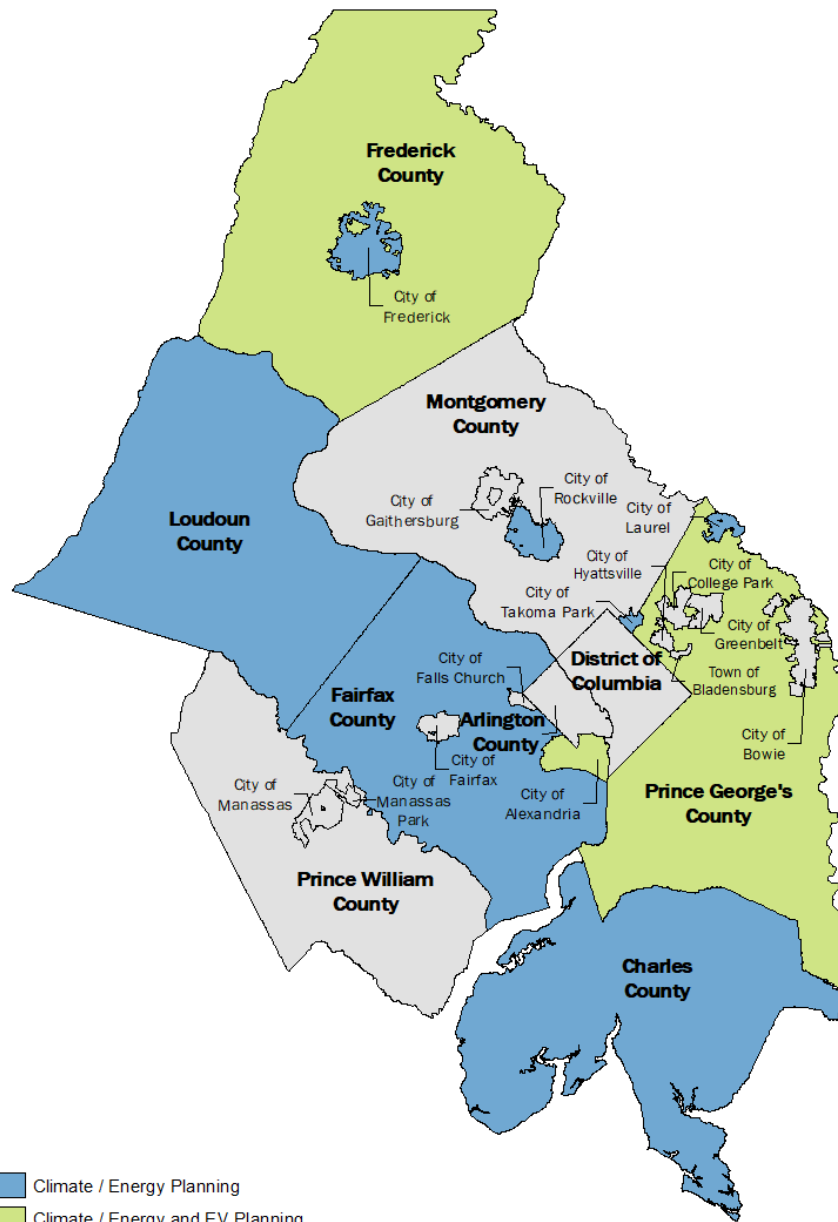
What Would It Take to Meet the 2030 Goal?



Cross-cutting: Climate, Equity, Transit, and Housing

- *2030 Climate and Energy Action Plan* identified equity-focused actions the region must take in pursuit of its climate goals.
 - Prioritizing sustainable energy access for all residents.
 - Increased transit use and fewer solo drivers.
 - More housing options that use less energy.





Local Climate & Energy Technical Assistance

COG is supporting local climate and energy action plans and electric vehicle (EV) fleet policies and plans.



Accelerating Action

➤ Targeted Grants/Technical Assistance

- Housing Affordability Planning Program; Transit Within Reach; Transportation Land-Use Connections (TLC) Program.
- Climate/energy planning; Zero emission vehicles coordination.

➤ Forward-focused Strategies

- Climate and Energy Action Plan; Housing Equity Plan; Visualize 2045 Aspirational Initiatives.

➤ Maps/Tools/Professional Development

- Maps and data; Housing Messaging Playbook; Climate Partners website; Racial equity professional development.

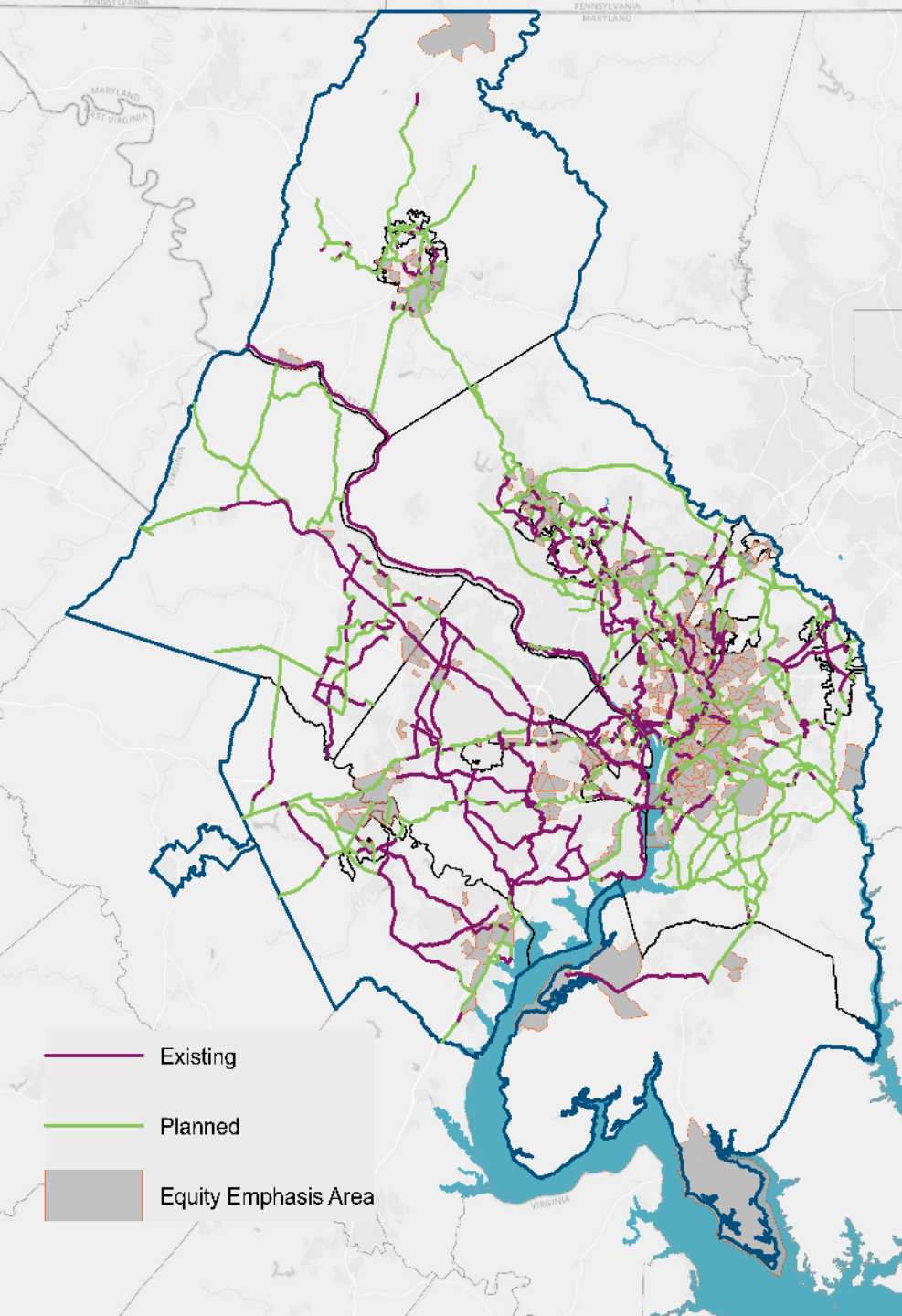
Housing Affordability Planning Program

- Made possible with \$500,000 from Amazon Housing Equity Fund.
- \$75,000 grants to local governments and non-profit developers engaged in affordably-priced housing near transit.
 - Toward design work, feasibility studies, and zoning analyses to help jumpstart developments.



National Capital Trail Network (NCTN)

- Long-distance, off-street trails accessible for people of all ages and abilities and suitable for both transportation and recreation.
- 180 of 225 HCTs are within half a mile.
- 55% of the network is unbuilt.



Bipartisan Infrastructure Bill

- Region to receive about \$20B/5 years.
 - \$3B (DC), \$7.6B (MD) and \$9.7B (VA)
- Additional \$30B available - competitive grant programs that our members individually, or collectively thru COG/TPB, can pursue.
- Alignment with COG framework - climate and equity goals.



VRE at Potomac River (Leandro Neumann Ciuffo/Wikimedia Commons)

Chuck Bean

COG Executive Director

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Washington, DC 20002

[mwkog.org/2030 framework](http://mwkog.org/2030-framework)





Memorandum

TO: City Council

FROM: Alfred Lott, City Manager

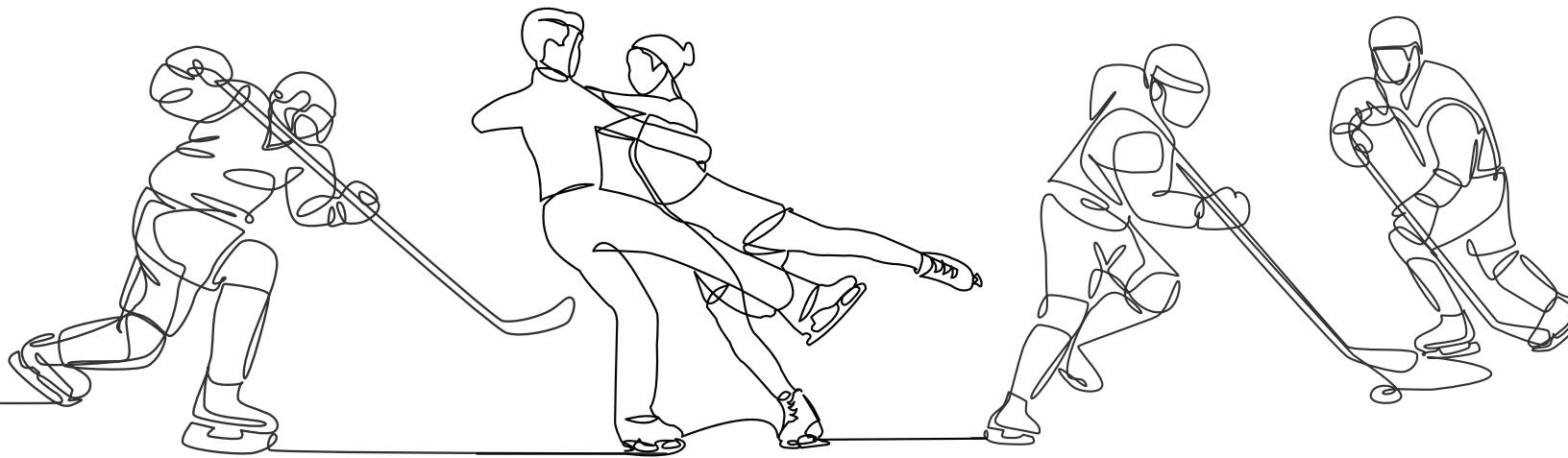
SUBJECT: Bowie Ice Arena Site Fit Presentation

DATE: 03/31/2022

At Council's request, staff was instructed to evaluate an undeveloped area at the Bowie Golf Course in which to consider for the construction of a new one-sheet ice arena. The 292 Design Group was hired to conduct a Site Fit Analysis that would include developing a conceptual site plan, conceptual floor plan, and cost estimate. Tom Betti of the 292 Design Group will present to Council the findings of the Site Fit Analysis.

ATTACHMENTS:

1. 20220404 - 292 Design Group Site Fit Report & Cost Estimate
2. 20220404 - 292 Bowie Ice Arena Presentation



Bowie Indoor Ice Arena Facility Feasibility Study

Bowie, Maryland | March 2022

Prepared by

292DesignGroup

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Executive Summary

Executive Summary

The consulting team of 292 Design Group, Frederick Ward Associates, and RJM Construction were selected to conduct a study to determine the feasibility of adding a new indoor ice arena facility at the Bowie Golf & Country Club, specifically a portion of land located at the NW intersection of Rockledge and Laurel Bowie.

The study addresses zoning considerations, property boundaries, setbacks, parking requirements, future expansion capabilities, storm-water management, and access to utilities.

The study includes the following components:

- Soil Conditions
- Ice Arena Program
- Concept Site Plan
- Concept Floor Plan
- Traffic Analysis
- Estimate of Probable Cost

Background

Based on the existing Bowie Ice Arena facility assessment completed by 292 in August of 2021, it was determined that the City of Bowie should consider constructing a new ice arena on a new site. This direction was presented as a viable option because the cost to upgrade the existing facility was exorbitant and it would also free up land in Allen Pond Park for other uses.

Process

The study process consisted of a three phased approach; phase one consisted of geotechnical evaluation of the site along with a traffic study, phase 2 consisted of programming and concept planning, and phase 3 includes a budget estimate that includes both construction and soft costs to determine an overall project budget.

The study progressed as each phase was completed and approved.

Arena Features

The new ice arena was designed based on the amenities of the existing Bowie Ice Arena. The goal is to replace the existing ice arena with a new ice arena that matches the same program features. The features are as follows:

- NHL size ice sheet (85'x200')
- Management office
- Lobby
- Seating for 330 spectators
- Concessions
- Meeting Rooms
- Public toilet rooms, including one single user toilet room
- Pro-shop
- 5 team rooms
- Referee room
- Storage
- Ice resurfacer room
- Refrigeration room
- Necessary support space consisting of mechanical, IT, and electrical rooms.

The facility is designed to be fully ADA compliant and to accommodate a future expansion.

Construction Systems

The facility is proposed to be constructed of insulated precast wall panels because of their durability and excellent resistance to condensation. The roof system consists of long-span steel bar joists, perforated metal decking (to help with acoustics), R-38 of rigid insulation, and a fully adhered roof membrane.

The refrigeration system will be industrial grade with heat recovery that will be used to provide sub-soil heating to prevent permafrost under the rink, to heat the ice-resurfacer water, and to also pre-heat domestic water. Dasher boards are state of the art steel framed system with tempered glass shielding.

Mechanical systems include desiccant dehumidification system and rooftop HVAC units with energy recovery.

Electrical lighting is 100% LED including the sport lighting over the rink.

The above construction system highlights are tried and true systems that will provide the City of Bowie with a state of the art well designed and constructed ice arena.

Per the City of Bowie requirements, LEED Silver Certification has been anticipated for the facility.

Conclusion

Based on the following report, 292 found that the site can accommodate a new single sheet ice arena along with the ability to expand the facility in the future.

Cost Estimate

The following summary outlines the costs for a new ice arena on the identified site. A more detailed breakdown of the costs can be found in the cost estimate section of this report.

Architectural/Structural	\$7,621,108.00
Ice System	\$1,500,000.00
Plumbing/Fire Protection/HVAC	\$1,622,900.00
Electrical	\$1,088,290.00
Site Work	\$1,572,133.00
LEED Silver	\$2,750,000.00
Escalation/Contingency/Contractor Fee	\$1,768,911.00
Total Construction	\$17,923,342.00
Architectural/Engineering Fee	\$1,344,251.00
Owner/FFE, and Soft Costs	\$594,617.00
Owner Contingency	\$537,700.00
Total Project Estimate	\$20,399,909.00

Geotechnical Evaluation

Report of Subsurface Exploration and Geotechnical Evaluation
Bowie Ice Arena
Laurel Bowie Road - Bowie, Maryland
Specialized Engineering Project No. 218736

Prepared for:

Frederick Ward Associates
5 South Main Street; PO Box 727
Bel Air, Maryland 21014

Prepared by:

Specialized Engineering
4845 International Blvd, Suite 104
Frederick, Maryland 21703

January 20, 2022



SPECIALIZED ENGINEERING
Engineers • Geologists • Inspectors

SPECIALIZED ENGINEERING

Engineers • Geologists • Inspectors

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Charles R. Mitchell, P.E.
David S. Schultz, P.E.
Al Nouri, Ph.D., P.E.
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Gerald S. Ross, Jr.
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Robert W. Simon

January 20, 2022

Frederick Ward Associates

5 South Main Street; PO Box 727
Bel Air, Maryland 21014-0727

Attention: Mr. Bruce T. Beasman, P.E.
Project Manager

Reference: **Preliminary Report of Subsurface Exploration and Geotechnical
Evaluation
BOWIE ICE ARENA**
Laurel Bowie Road
Bowie, Maryland
Specialized Engineering Project No. 218736

Dear Mr. Beasman:

Specialized Engineering (SE) is pleased to submit our report concerning the preliminary subsurface exploration and geotechnical evaluation for a new ice arena on Laurel Bowie Road in Prince Georges County, Maryland.

The report explains the exploration procedures, describes the general site and subsurface conditions, and presents evaluations and preliminary recommendations relevant to geotechnical considerations for the project. If project characteristics presented in this report are different or changed, **Specialized Engineering** should be notified, so that the evaluations and recommendations presented can be reviewed and revised, as necessary.

If you have any questions concerning this report or require additional assistance on the project, please do not hesitate to contact us.

Respectfully submitted,
Specialized Engineering

Jeremiah Cook, P.E.
Senior Staff Engineer



Ira L. Helms, P.G., P.E.
Principal

4845 International Blvd, Suite 104 • Frederick, Maryland 21703
Phone: 301-607-4180 • Fax: 301-662-6122 • www.specializedengineering.com

Client Driven. Employee Owned

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1.0 EXECUTIVE SUMMARY

This Executive Summary is provided for the convenience of the reader interested in having a basic understanding of the geotechnical investigation performed for a new ice arena planned along Laurel Bowie Road, north of Rockledge Drive, in Bowie, Maryland. In addition, there are important limitations regarding this report that should be fully understood. The reader should contact Specialized Engineering (SE) with any questions regarding this report. The exploration included fourteen (14) soil test borings designated B-01 through B-12 and SWM-01 through SMW-02, that were advanced to depths of 10 feet to 25 feet below existing surface grades.

The data developed during this study indicate that the subsoil and groundwater conditions at the site are generally adaptable for the construction of the proposed building provided the recommendations in the report are followed.

Shallow foundations (continuous and spread footings) are considered adequate for the support of the proposed building. The footings should be supported on the undisturbed, suitable-bearing natural soils, except moderately to highly plastic clays and elastic silts ($LL > 40$ and $PI > 20$) wherever encountered, or on controlled structural fill placed on suitable natural soils.

However, if the column and wall loadings of the proposed structure are considerably higher than values assumed in this study, then an alternative foundation system, such as spread footing bearing on a ground-improvement scheme or deep foundations, should be considered.

Shallow excavations (less than 8-10 ft deep) can likely be made with conventional earth moving equipment in good working order. Neat excavations should not be expected in sandy soils on the site.

Water was observed within six (6) of the fourteen (14) borings (B-6 to B-8, B10 to B-11, and SWM-1) at the time of drilling at depths varying from 7 to 22 feet below surface grades. Soils with higher natural moisture contents were observed at varying depths in borings B-03, B-07, B-10, and SWM-01. Stormwater management BMP's utilizing infiltration are suitable for use on this site.

Preliminary recommendations relative to earthwork, the design and construction of building foundations and pavements are detailed in the report.

The owner/designer should not rely solely upon the executive summary and must read and evaluate the entire contents of this report, prior to utilizing our engineering recommendations in the preparation of design and construction documents. Specialized Engineering should be contacted with any questions regarding this report.

2.0 PROJECT INFORMATION

2.1 PROPOSAL AND PROJECT AUTHORIZATION

Specialized Engineering's (SE's) professional services for a new ice arena along Laurel Bowie Road, just north of the intersection with Rockledge Drive near Bowie, Maryland, were planned and performed in accordance with SE Proposal No. B21-18076, dated October 12, 2021. The professional services were authorized by Mr. Bruce Beasman via email on November 29, 2021.

2.2 PROJECT DESCRIPTION

One building, housing an ice arena, as well as service drives, parking areas and stormwater management (SWM) facilities are planned. The plans provided to SE also show the location of potential future expansion for the building and parking lots. SE received an updated site plan on January 5, 2022. The updated plan shows a finish floor elevation (FFE) of 142 feet at the main entrance. In an email received the same day, it is stated that the ice rink and locker rooms will be at FFE 139 feet. The Structural Engineer also stated that those elevations are subject to change as the site plans develop further. The Structural Engineer provided wall loads of 8.5 kips per linear foot for the single sided bearing walls, and 12.5 kips per linear foot for double sided bearing wall (i.e., if future expansion occurs on north wall to add an additional rink). We have assumed column loads of 300 kips based on past experience with other similar ice arenas in the area.

A stormwater management facility is planned at the western side of the site. Details regarding the size and type have not been provided.

The boring location plan provided to SE for development of our subsurface investigation also shows a retaining wall located on the west side of the site. Site grading plans have not been provided, nor any additional information associated with the possible retaining structure.

If any of the noted information is incorrect or has changed, please inform Specialized Engineering so that SE can review the geotechnical data and amend the evaluations and recommendations presented in this report, if appropriate.

2.3 PURPOSE AND SCOPE OF SERVICES

The purpose of this study was to determine general subsurface conditions at the site and to evaluate the encountered conditions relative to geotechnical considerations for the planned construction.

The scope of services for this study included site reconnaissance of the project area and determination of subsurface conditions through field exploration and

laboratory testing. The study included evaluation of the site and subsurface conditions relative to the proposed construction and preparation of a report of findings, evaluations, and preliminary recommendations.

The report addresses the following:

- A discussion of subsurface conditions encountered;
- An evaluation of the laboratory test results and subsurface conditions, as the conditions relate to proposed site development;
- Preliminary geotechnical recommendations for site preparation, including cut and fill slope inclinations and placement and compaction of fill soils.
- Preliminary geotechnical recommendations regarding the suitability of infiltration for storm water management;
- Preliminary geotechnical recommendations in connection with design and construction of building foundations, slabs-on-grade and pavements;
- Preliminary recommendations for seismic site classification and site seismic response coefficients S_s and S_1 , in accordance with IBC 2015; and
- Additional comments and recommendations relating to observed, identified geotechnical conditions that could impact site development.

The scope of SE's geotechnical services did not include an environmental assessment for determining the presence or absence of wetlands or hazardous or toxic materials in the soil, bedrock, groundwater, and air, on or below or around this site. Any statements in this report and/or on the boring logs regarding odors, colors, and unusual or suspicious items or conditions are strictly for the information of the Client.

Specialized Engineering did not provide any service to investigate or detect the presence of mold, moisture as related to mold, or other biological contaminants in or around any structure, or any service that was designed or intended to prevent or lower the risk of occurrence or amplification of the same.

2.4 SUBSURFACE EXPLORATION

From December 22 to December 27, 2021, SE's subsurface exploration sub-contractor drilled fourteen (14) soil test borings:

- Eight (8) building area borings (B-03 to B-08 and B-10 to B-11) were drilled, each to a depth of 25 ft below surface grades.
- Four (4) pavement area borings (B-01 to B-02, B-09, B-12) were drilled, each to a depth of 10 ft below surface grades.
- Two (2) stormwater basin borings (SWM-01 to SWM-02) were drilled, each to depths of 15 ft below surface grades.

The borings were drilled by an ATV-mounted drill rig, using continuous-flight, hollow-stem augers, and were extended to planned termination depths ranging from 10 to 25 ft below existing site grades. Upon the completion of drilling, the boreholes were backfilled with auger cuttings.

Drilling and soil sampling were conducted in accordance with procedures generally recognized and accepted as standard methods of exploration of subsurface conditions related to earthwork and foundation engineering projects. Representative soil samples were obtained by employing split-spoon sampling procedures in general accordance with the ASTM D1586 test method. Standard Penetration Tests conducted during the soil sampling operations reflect use of an automatic hammer.

Soil samples obtained from the borings were identified according to boring number and depths, and a representative portion of each sample was sealed in a container to protect against moisture loss. The soil samples from the borings were subsequently transported to the Specialized Engineering laboratory for visual classification and further evaluation.

Soil samples obtained during the field investigation phase of the study will be stored for a period of 30 days from the date of this report. It will be necessary for SE to discard the samples at the end of this storage period unless an alternate disposition is specified prior to termination of the indicated storage period.

The location of the site and approximate locations of the test borings are shown on the Boring Location Plan in **Appendix A**. The findings of the soil test borings are presented on the Boring Logs in **Appendix B**.

2.5 LABORATORY TESTING

SE's professional staff visually classified the soil samples in the field and in the laboratory, in general accordance with ASTM D2488. Tests were conducted on various samples for natural moisture content (ASTM D2216), grain-size analysis (ASTM D6913), and Atterberg limits (ASTM D4318). The laboratory test results are presented on the boring logs in **Appendix B** and on data sheets in **Appendix C**.

2.6 INFILTRATION TESTING

SE performed constant head infiltration testing at boring locations SWM-1 and SWM-2. **Table 2.1** below presents the results of the infiltration testing and USDA soil classification tests.

Table 2.1 – Summary of water levels in the soil test borings

Location	Depth of Infiltration Test (Elev)	Infiltration Rate	USDA Soil Classification
SWM-01	4.0 ft (123.2 ft)	0.81 in/hr	Sand
SWM-02	9.0 ft (125.1 ft)	1.68 in/hr	Sand

Infiltration test depths were performed at 4 feet and 9 feet below existing grades. At SWM-01 water was encountered at 7.0 feet below grade. Infiltration tests must be performed a minimum 2 feet above the existing groundwater elevation; therefore, the test was performed at a higher elevation. The test results shown in the table indicate that infiltration will likely be possible at this site.



Figure 3.2 – Aerial image of the site (after Google Earth)

3.2 AREA GEOLOGY

The information regarding geology in the site area is presented to provide insight into site subsurface conditions. The site is located within the Coastal Plain physiographic province and, based on published geologic mapping, is underlain by Brightseat-Severn Formation. These formations primarily consist of sand and silt with some clayey material, commonly dark gray to greenish gray. The formation at this site is also very closely bordered by the Sand-gravel facies of the Potomac Group Formation, primarily consisting of sand, gravel and silt-clay. The silt-clay is commonly white and pale gray. **Figure 3.3** is an excerpt of the geologic mapping for the site area.

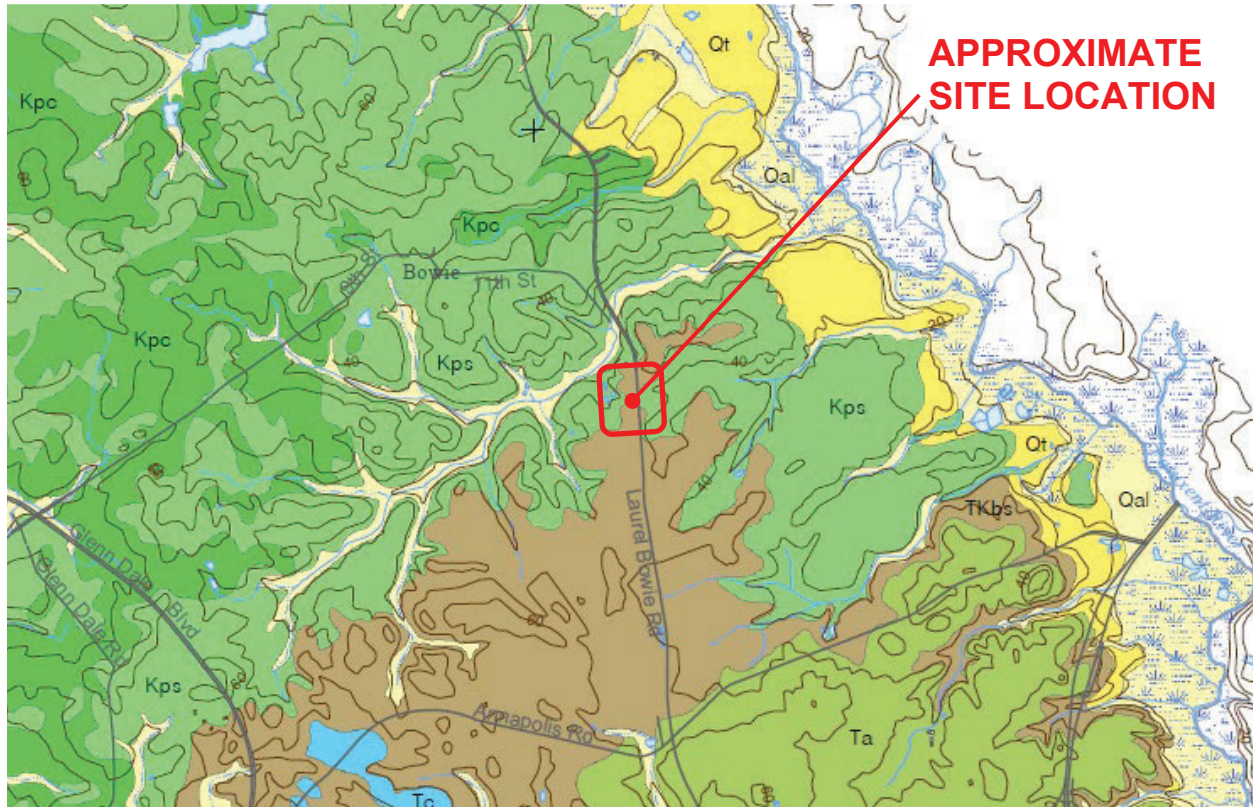


Figure 3.3 – Geologic mapping in the area of the site
(Maryland Geological Survey)

3.3 SUBSOIL CONDITIONS

SE observed topsoil thicknesses varying from 2 to 6 inches in the borings. The observed topsoil thicknesses should be considered valid only at the specific boring locations. Considerably different thicknesses of topsoil and rootmat could occur between borings and across the site. Below the topsoil, SE encountered natural soils.

Below the topsoil, no man-placed fill was encountered in any of the fourteen (14) borings drilled on site. The topsoil was underlain by two (2) soil stratum that are representative of the site geology. The natural soil strata are briefly described hereafter:

MAN-PLACED FILL

No fill soils were identified within the extent of our investigation. A review of historical aerial imagery shows that the grading at the site has changed very little in the last 30 to 40 years.

STRATUM I – BRIGHTSEAT-SEVERN SOILS

This stratum was encountered at all fourteen (14) test boring locations. The soils within this stratum consist of interbedded layers of generally brown, reddish-brown, orangish brown, gray, sands, silty sands, clayey sands, lean clay with some gravel and silt (USCS

Designations: SP, SM, SC, CL and ML). The SPT “N”-values within this stratum ranged from 4 bpf to 18 bpf. The encountered SPT “N”-values generally indicate consistencies for fine-grained soils ranging from soft to stiff, and relative densities of sandy soils ranging from loose to medium dense. Within the building footprint (borings B-03 through B-08 and B-10, B-11), primarily sands with varying levels of silt and clay were encountered. In borings B-03, B-07, and B-11 some lean clay was encountered within the top 10 feet. Borings B-04, B-05, B-08 and B-10 also contained silt layers consistent with the description of the Severn Formation as described previously.

In the roadway and parking lot borings (borings B-01, B-02, B-09 and B-12), similar silty, clayey and sandy soils were observed. Not counting surficial soil samples, N-values were observed to vary between 6 and 28 bpf, with one exception. Within Boring B-9, the sample taken from 8.5 to 10 feet below grade encountered very dense sand with an N-value of 60 bpf.

In the two borings drilled within the proposed stormwater basin area, (SWM-01 and SWM-02), sandy soils with varying amounts of silt and clay were encountered throughout the full depth of each boring. Boring SWM-02 also encountered a silty gravel layer at 13.5 feet below grade.

STRATUM II – POTOMAC FORMATION

This stratum was encountered at three (3) test boring locations. The soils within this stratum consist of interbedded layers of generally white to dark gray, lean clay and silt (USCS Designations: CL and ML). The SPT “N”-values within this stratum ranged from 6 bpf to 28 bpf. The encountered SPT “N”-values generally indicate consistencies for fine-grained soils ranging from medium stiff to very stiff, and relative densities of sandy soils ranging from loose to medium dense. At deeper elevations borings B-03, B-06 and B-10 also extended into silt and clay soils consistent with those encountered in the Potomac Formation.

A summary of the results of the laboratory tests performed on representative soil samples is presented in **Appendix C** and on the Boring Logs in **Appendix B**.

The description of subsurface conditions presented above is of a generalized nature, provided to highlight the major strata encountered in the borings. The test boring logs included in the **Appendix B** should be reviewed for specific information regarding the individual test locations. The stratification lines shown on the test boring logs represent conditions only at the actual test locations. Variations in strata thicknesses can occur and should be expected between test locations. The stratification lines shown on the boring logs represent the approximate boundaries between subsurface materials. Actual transitions between strata could occur gradually and/or at slightly different depths.

3.4 GROUNDWATER CONDITIONS

Table 3.1 is a summary of water level observations in the borings where free water was encountered in the borings. The presence of free water was observed primarily in an east-west orientation across the middle of the site. This correlates closely with the natural swale in the center of site the slopes down from east to west. For reference, this is where the “Future Expansion” is called out on the site plans provided by the client.

Water was observed within five (5) of the building area borings and within one of the SWM borings at the time of drilling. Water was not observed within any of the four (4) parking lot borings.

Table 3.1 – Summary of water levels in the soil test borings

Boring	Water Level at the time of drilling (Elev)	Water Level at the end of drilling (Elev)
B-06	18.5 ft (120.9 ft)	None
B-07	17.0 ft (118.9 ft)	None
B-08	13.5 ft (118.3 ft)	23.0 ft (108.8 ft)
B-10	17.5 ft (113.7 ft)	23.0 ft (108.2 ft)
B-11	22.0 ft (116.8 ft)	None
SWM-01	7.0 ft (120.2 ft)	12.0 ft (115.2 ft)

Perched water could be encountered during the site development, especially if the excavations are carried out during wetter months or following prolonged periods of heavy precipitation. Groundwater levels are expected to vary seasonally and during wetter and drier periods.

4.0 GEOTECHNICAL EVALUATION

The information developed during this study indicate that the subsoil and groundwater conditions are adaptable for the proposed development of the site, provided the recommendations presented hereafter are followed.

Shallow foundations (continuous and spread footings) are considered adequate for the support of the proposed building. The footings should be supported on the undisturbed, suitable-bearing natural soils, except moderately to highly plastic clays and elastic silts ($LL > 40$ and $PI > 20$) wherever encountered, or on controlled structural fill placed on suitable natural soils.

However, if the column and wall loadings of the proposed structure are considerably higher than values assumed in this study, then an alternative foundation system, such as spread footing bearing on a ground-improvement scheme or deep foundations, should be considered.

Shallow excavations (less than 8 to 10 feet deep) during the development of the site can generally be achieved with conventional earth-moving equipment (dozers, pans and hoes) in good working order. Neat excavations should not be expected in the sandy soils.

It is SE's opinion that conventional dewatering measures, such as diversion ditches, interceptor drains, and sumps with pumps should be adequate for limited dewatering operations at the site during construction. Water was not observed within the eight (8) borings which are primarily located at the north and south side of the site. Water was observed in six (6) borings across the central portion of the site at depths varying from 7 to 23 feet below surface grades. Moreover, some perched groundwater could be encountered in excavations.

Much of the soil likely to be excavated at the site should be re-usable for site grading purposes. Moisture conditioning of excavated site soils used as engineered fill will likely be needed during construction. Though we did not encounter any within the extent of our investigation, fat clays (CH) or elastic silts (MH) soils encountered at the site during construction should not be reused as engineered fill.

The infiltration testing performed as part of our investigation leads us to believe that infiltration will be possible on this site. However, the presence of groundwater was noted in SWM-01 at depths shallower than 10 feet below existing grades. The Civil Engineer should take note of this while planning the stormwater management facilities.

5.0 RECOMMENDATIONS

5.1 SITE PREPARATION AND EARTHWORK

The following recommendations are intended for the satisfactory performance of site preparation and earthwork that may be needed to attain planned grades within footprint areas of proposed building, paved areas, and other site improvements.

Once clearing, grubbing, and general excavation have been completed, exposed subgrade soils in foundation areas should be carefully evaluated by a Geotechnical Engineer from Specialized Engineering. Exposed subgrades should be proof-rolled to the extent practical. Soils that are observed to rut or deflect excessively under the moving load of a proof-roll should be undercut and replaced with compacted fill that meets the requirements listed below. All proof-rolling and undercutting activities should be observed and evaluated by Specialized Engineering and should be performed during periods of dry weather. If proof-rolling of an area is not practical, Dynamic Cone Penetrometer (DCP) and other types of testing can be performed by Specialized Engineering personnel to evaluate exposed subgrade conditions.

Efforts should be made to keep subgrade areas properly drained and free of ponding water. Subgrade strength can be reduced if soils are exposed to construction traffic and increases in moisture content, possibly resulting in the need for undercutting of materials that may become unsuitable. During periods of cold weather, frozen soils should not be filled upon and cannot be used as fill or backfill.

The following criteria are provided regarding suitable soil types for use as site fill and backfill materials:

- Materials satisfactory for use as controlled fill include clean soil or bankrun sand and gravel (GW, GM, and SM), provided the soils meet the dry density and plasticity requirements outlined below:

Maximum Dry Density	≥ 105 pcf, standard proctor
Liquid Limit (%)	≤ 40
Plasticity Index	≤ 20
- ML, CL, GC and SC materials also can be used as engineered fill, provided the soils meet the dry density and plasticity requirements outlined above and are approved by the Geotechnical Engineer.
- Highly plastic soils (CH & MH soils) should not be used as engineered fill.
- Fill materials should be free from topsoil, organics and rock fragments having a major dimension greater than 3 inches.
- Existing soils at the site can be selectively used as controlled engineered fill, provided the soils meet the dry density and plasticity requirements outlined previously and are approved by the Geotechnical Engineer.

- The moisture contents of soils used as fill should be within plus or minus two (± 2) percentage points of the optimum moisture content of soils at the time of compaction. The need for some moisture adjustments should be anticipated.
- Fill should be placed in maximum 8-inch thick, loose, horizontal lifts and should be compacted uniformly using suitable compaction equipment.
- Controlled, engineered fill should be compacted to at least ninety-five (95) percent of the maximum dry density, as established by ASTM D698 test method (standard Proctor).

For proper site preparation, the earthwork operations should be observed and tested by representatives of the Geotechnical Engineer.

Limited Space Backfilling: Limited spaces are defined as areas where backfill operations are restricted to the use of small mechanical compaction equipment. Most deficiencies in compacted backfill around subsurface structures have occurred in limited spaces, where required densities are difficult to achieve because of restricted working room and where relatively low compaction effort is provided by the compaction equipment used. All backfill, including that placed in limited spaces, must be systematically compacted to the project requirements, even if crushed aggregate is being placed.

Oversized rock fragments should not be placed around pipes or other below-ground structures. Proper placement and compaction of backfill around pipes, conduits and utility lines is often difficult and should be given special attention. Clearly defined project specifications for confined zone backfill compaction and sufficient field monitoring are essential in preventing problems associated with utility trench backfill settlement.

Also, backfilling in limited access areas, such as in utility trenches and around below-grade structures such as manholes, junction boxes, and curb inlets, **should have a loose-lift thickness limited to 4- to 6-inches**. A sufficient amount of testing or observation should be conducted to verify that proper compaction is achieved. In extremely tight spaces, use of alternate backfill materials, such as flowable fill, should be considered.

5.2 SHALLOW FOUNDATIONS

As stated earlier, the proposed building can be supported on conventional shallow foundations (continuous and spread footings) bearing on the existing soils of Stratum I, II or controlled structural fills, provided the supporting subgrade soils are prepared in accordance with Section 5.1 "Site Preparation and Earthwork" and the footings are proportioned based on an allowable bearing capacity not to exceed 2,000 psf.

However, if the column and wall loadings of the proposed structure are considerably higher than values assumed in this study, then an alternative foundation system, such as spread footing bearing on a ground-improvement scheme or deep foundations, should be considered.

When the building design is completed, an estimate of the anticipate foundation loading should be provided by the project's Structural Engineer to Specialized Engineering in order to provide a final recommendation for the design and construction of the building.

5.2.1 Spread Footings on Natural Soils or Structural Fill

As stated earlier, shallow foundations (continuous and spread footings) supported on natural soil of Stratum I, II or controlled structural fills are considered adequate for the support of the proposed building, provided that the supporting subgrade soils are prepared in accordance with Section 5.1 "Site Preparation and Earthwork" and that the footing sizes are proportioned for the allowable bearing capacity.

While we did not encounter them during out investigation, the foundations should not be supported on moderately to highly plastic clays or elastic silts with $LL > 40$ and $PI > 20$. Because of their known high shrink/swell potential and its detrimental effects on building foundations, these soils, when encountered at or below the foundation subgrade(s), should be excavated in their entirety from below the foundation subgrade(s) or to at least 4 feet below the adjacent exterior finished grade, whichever is shallower. The excavated soils should then be replaced with approved controlled fill. Alternatively, the foundations can be lowered to 4 feet below the adjacent exterior finished grade when supported on these soils.

Continuous foundations that are partially located in fill and partially in undisturbed soil formation, should be designed as grade beams, 5 feet on either side of the transition. The column footings, in similar circumstances, should be extended into the underlying undisturbed soils.

The footings may be sized and designed on the basis of allowable bearing pressures indicated below, subject to observation and approval of soil conditions at the bottom of footing excavations for suitable soil bearing by the Geotechnical Engineer of Record or his qualified representative:

SOIL CONDITIONS AT SUBGRADE	RANGE OF ALLOWABLE BEARING PRESSURE (psf)	MINIMUM WIDTH OF FOOTINGS (inches)
Undisturbed Soils of Strata I, II Or Controlled Structural Fill		
Isolated Footings	2,000	30
Continuous Footings	2,000	30

5.2.2 Spread Footings on Improved Ground

If the column and wall loadings of the proposed structure planned for the site are considerably higher than values assumed in this study, the proposed building could be supported on spread footings bearing on conventional footing foundations with the use of some type of ground improvement to increase allowable bearing pressures and to control foundation settlements.

Ground improvement systems are designed, installed and warranted by Specialty Contractors. There are various ground improvement systems available, and it appears that a likely choice for the site would be compacted aggregate piers. Ground improvement using compacted aggregate piers generally is accomplished through installation of appropriately-spaced, densely-compacted aggregate piers that are formed within drilled cavities in the existing site soils to provide a reinforced soil mass below foundations. The compacted aggregate piers strengthen and stiffen the overall soil mass below foundations for increased bearing support and control of settlements. Aggregate pier diameters typically range from 24 to 36 inches in size, with installation spacing and depths varying as needed for provision of adequate bearing support conditions and control of foundation settlements.

The Specialty Contractor will determine the design bearing pressure to be used for support of structure footings, based on consideration of structure loads, controlling soil conditions, details of the ground improvement procedures to be used, and any criteria specified with regard to tolerable settlements. Allowable bearing pressures of 6 kips per square foot (ksf) and greater sometimes can be achieved for foundation support. Unless otherwise specified by the Architect and/or Structural Engineer, typical criteria for tolerable settlements generally can be taken as maximum total settlements less than 1 inch and differential settlements not to exceed 1/2 inch over a 30-foot horizontal distance.

The ground improvement system to be used at the site should be designed, constructed and warranted by the Specialty Contractor, who should be an experienced licensee of the particular ground improvement system to be used. The

Specialty Contractor is solely responsible for their design and to determine if additional subsurface exploration is needed to facilitate design.

Representatives of the Geotechnical Engineer should observe installation of the ground improvement system to verify that ground improvement elements are installed in a consistent manner and in accordance with approved drawings and specifications. In addition, Specialized Engineering suggests that a minimum of two ground-improvement elements should be load tested for confirmation of parameters associated with design. The load tests would be performed at locations selected by the Specialty Contractor and approved by the Geotechnical Engineer. The load test report(s) provided by the Specialty Contractor should be reviewed by the Geotechnical Engineer of Record.

However, all these ground-improvement techniques are propriety foundations systems. Accordingly, the selected foundation system should be designed, constructed and warranted by an experienced licensee of the ground improvement system selected.

5.2.3 Depth of Footings

The embedment depth of all footing subgrades is governed by the minimum depth requirements for protection against frost heave in accordance with the International Building Code (IBC 2009). The depth of frost in Prince George's County is approximately 24 to 30 inches. Therefore, we recommend that the bottom of the footings be located at least 30 inches below the lowest adjacent exterior finished grade.

5.2.4 Anticipated Settlements

The footings, if designed on the basis of recommended allowable bearing pressures, are expected to experience a maximum total settlement of 1 inch with differential settlement limited to $\frac{3}{4}$ -inch between adjacent column footings, or over a 30-foot span along a column footing.

5.2.5 Footing Excavations

Because of possible variations in subsurface conditions and related bearing capacity, all footing excavations and trenches should be observed and approved by the Geotechnical Engineer. Water and possibly some loose soil may collect in the footing excavations as a result of surface precipitation and near ground surface seepage. Therefore:

- Water, loose soil and soil softened by water should be removed from the bottom of the footing excavations before placing concrete.
- Footing excavations should not be left open for long periods. If the concrete

cannot be placed due to inclement weather conditions or any other unforeseen circumstances, the bottom of the footing excavations and trenches should be protected by undercutting 3 inches and placing a 3-inch thick lean-mix concrete (2,000 psi) workmat immediately upon approval and before reinforcing steel is placed.

5.3 SLABS-ON-GRADE

SE was not provided anticipated loading conditions for floor slabs. The following recommendations are intended for design and construction of slabs on grade for the planned structures.

- Floor slab excavation should be proofrolled and prepared as described under 'Site Preparation and Earthwork'.
- A free-draining granular blanket of crushed stone or gravel should be placed under the floor slab for lateral drainage and as a capillary barrier. The thickness of this blanket should be at least 6 inches.
- A 6-mil thick impermeable plastic membrane (vapor barrier) should be placed directly under the concrete floor slab and over the granular material.
- The entire floor slab area should be reinforced with a welded wire fabric as a minimum or as otherwise specified by the structural engineer.
- The column points and periphery walls should be isolated from the floor slab to minimize the possibility of the floor slab cracking due to relative displacement.
- The floor slab should be designed on the basis of modulus of subgrade reaction "k" of not more than 125 pci.

The installation of an ice rink on top of the floor slab presents the unique risk potential of heave due to freezing the soil subgrades. Freezing temperatures applied above the subgrade soils can cause condensation to form beneath the concrete slab. Since temperatures will stay near freezing to maintain the ice, the condensation can freeze. Thus, SE recommends the use of an insulation like EPS geofoam and a high-quality vapor barrier below the ice rink slab. Measures should also be taken to prevent moisture from saturating the insulation beneath the cooling floor. For ice rinks that will be operated throughout the majority of the year, the use of a subfloor heating system (maintained around 38°F) may be needed to mitigate the potential to build up ice below the cooling floor.

The use of a moisture vapor retarding barrier between the aggregate layer and the bottom of the floor slab should be at the discretion of the Architect, who can evaluate the potential impact of water vapor transmission on floor coverings and interior furnishings.

In order to control slab cracking, floor slabs should be jointed in accordance with ACI guidelines, and any crack control inclusions, such as wire mesh, should be permanently supported in its proper position and not pulled up with hook bars during concrete placement.

On most projects, there is some delay between initial grading and the time when the Contractor is ready to construct slabs-on-grade. Although the near surface soils may have been placed and compacted adequately or exhibited a high consistency during initial grading, exposure to weather, construction traffic, and other factors can destroy the integrity of the subgrade soils.

On many projects, it becomes a point of controversy when remedial work is required to establish proper floor slab support. Prior to the construction of concrete floors, subgrades should be thoroughly proof-rolled and compacted to create a uniformly high density. SE recommends that the construction specifications include provisions for the restoration of the subgrade soils to an acceptable condition prior to the construction of floor slabs.

5.4 SEISMIC SITE CLASSIFICATION

Based on the subsurface conditions encountered at the site, the structural design should use the following site coefficients for seismic design based on Section 1615 of the International Building Code (2015) shown in **Table 5.1**.

Table 5.1 – Summary of Seismic Site Classification

Seismic Site Class	D
Spectral response acceleration at short periods, S_s	0.15
Spectral response acceleration at 1-second period, S_1	0.041
Site coefficient, F_a	1.6
Site coefficient, F_v	2.4

Based on information obtained from the soil test borings and our review and knowledge of local geology, it is SE's opinion that the potential for liquefaction of soils at the site due to earthquake activity is low.

5.5 PAVEMENT DESIGN

The pavement areas should be prepared as recommended in Section 5.1 of this report, "Site Preparation and Earthwork".

Any loose/soft areas should be undercut to suitable bearing subgrade and replaced with approved fill. If elastic silts or plastic clays ($LL > 40$ and $PI > 20$) are encountered at and below the planned subgrade elevations of the pavements for drive lanes and parking areas, the upper 2 feet of the moderately to highly plastic soils ($LL > 40$ and $PI > 20$), should be excavated and replaced with engineered fill consisting of approved soils.

Design values related to expected traffic loading were not provided. However, we do anticipate that the site soils are suitable for supporting parking lot pavements.

SE recommends that bulk soil samples be collected and tested by the Geotechnical Engineer prior to construction to determine a California Bearing Ratio (CBR) for design of a pavement section specific to the site soils. Once a site CBR value is determined and once traffic ESAL's are made available, a preliminary pavement design could be provided.

6.0 CONSTRUCTION CONSIDERATIONS

6.1 CONSTRUCTION QUALITY CONTROL

To assess that the in-situ soil conditions or those developed during construction, are as anticipated during the design stage, qualified representatives of the Geotechnical Engineer should provide observation and testing services during construction, as follows:

- Soils from cut areas or soil borrow should be sampled and tested to determine suitability for use as new engineered fill associated with proposed construction;
- Subgrade areas for construction of the proposed building, SWM facilities, and other site improvements should be monitored and tested to verify that the prepared subgrades will adequately support the planned construction;
- Construction of the building and site infrastructure should be observed and tested to verify general compliance with project design and construction documents.

6.2 RESPONSIBILITY OF THE DEVELOPER

Review and approval of drawings, specifications and reports by the municipal authorities, with or without recommendations, should in no way relieve the Developer of the responsibility for design, construction and performance of the structures on the project site, and potential damage to surrounding properties.

In Federal Register, Volume 54, No. 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its "Construction Standards for Excavations, 29 CFR, Part 1926, Subpart P". This document was issued to better allow for the safety of workers entering trenches or excavations. It is mandated by this federal regulation that excavations, whether the excavations are utility trenches, basement excavations, or footing excavations, be constructed in accordance with the new OSHA guidelines. It is SE's understanding that these regulations are being strictly enforced and if they are not closely followed, the Owner and the Contractor could be liable for substantial penalties.

The Contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The Contractor's "responsible person", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the Contractor's safety procedures. In no case, should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in all local, state, and federal safety regulations. SE is providing this information solely as a service to our Client. Specialized Engineering does not assume responsibility for construction site safety or the Contractor's or other parties' compliance with local, state, and federal safety or other regulations.

7.0 REPORT LIMITATIONS

This report has been prepared for the exclusive use of **Frederick Ward Associates and their Design Consultants** for application to geotechnical-related design and construction considerations for the new ice arena on Laurel Bowie Road, near Bowie, Maryland. The findings, evaluations, recommendations, specifications, and professional advice contained in this report have been provided specifically for the referenced project and are considered in accordance with generally accepted professional geotechnical engineering practices in the local area at the time of the study. No warranties are implied or expressed.

The professional advice provided in this report is based on Specialized Engineering's observed and/or determined site and subsurface conditions, and on project information provided by **Frederick Ward Associates and their Design Consultants**. Field exploration and laboratory testing programs associated with the study were limited; and during the course of the study, Specialized Engineering's Professional Staff may have adjusted the scope of work originally proposed, in order to accommodate encountered conditions, equipment capabilities, the Client's schedule, budgetary considerations, and other factors.

Some deviations from the site and subsurface conditions at the time of this geotechnical evaluation could be encountered during construction. In such cases, the Client should immediately notify Specialized Engineering to determine if the changed conditions could impact the evaluations and recommendations provided in this report. If Specialized Engineering is not retained to perform such evaluations, SE will not be responsible for the impact of the changed conditions on the geotechnical evaluations and recommendations made for the project.

After drawings and specifications for the project are more complete, Specialized Engineering should be retained and be provided the opportunity to review the final design drawings and specifications to determine whether Specialized Engineering's engineering evaluations and recommendations have been properly interpreted and incorporated into the design documents. At that time, Specialized Engineering may need to submit supplementary evaluations recommendations and/or perform additional exploration.

The opinions, conclusions, and recommendations expressed in this report are based on the subsurface conditions revealed by our field observations and subsurface exploration, and the results of analyses and studies performed, based on our Professional Engineer's interpretation. Specialized Engineering is not responsible for interpretations by others of our findings or data contained within the report.

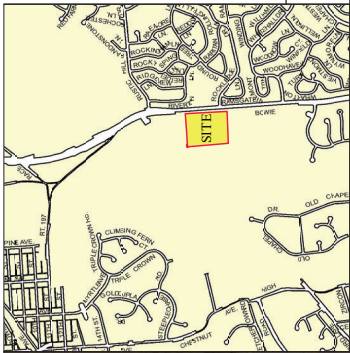
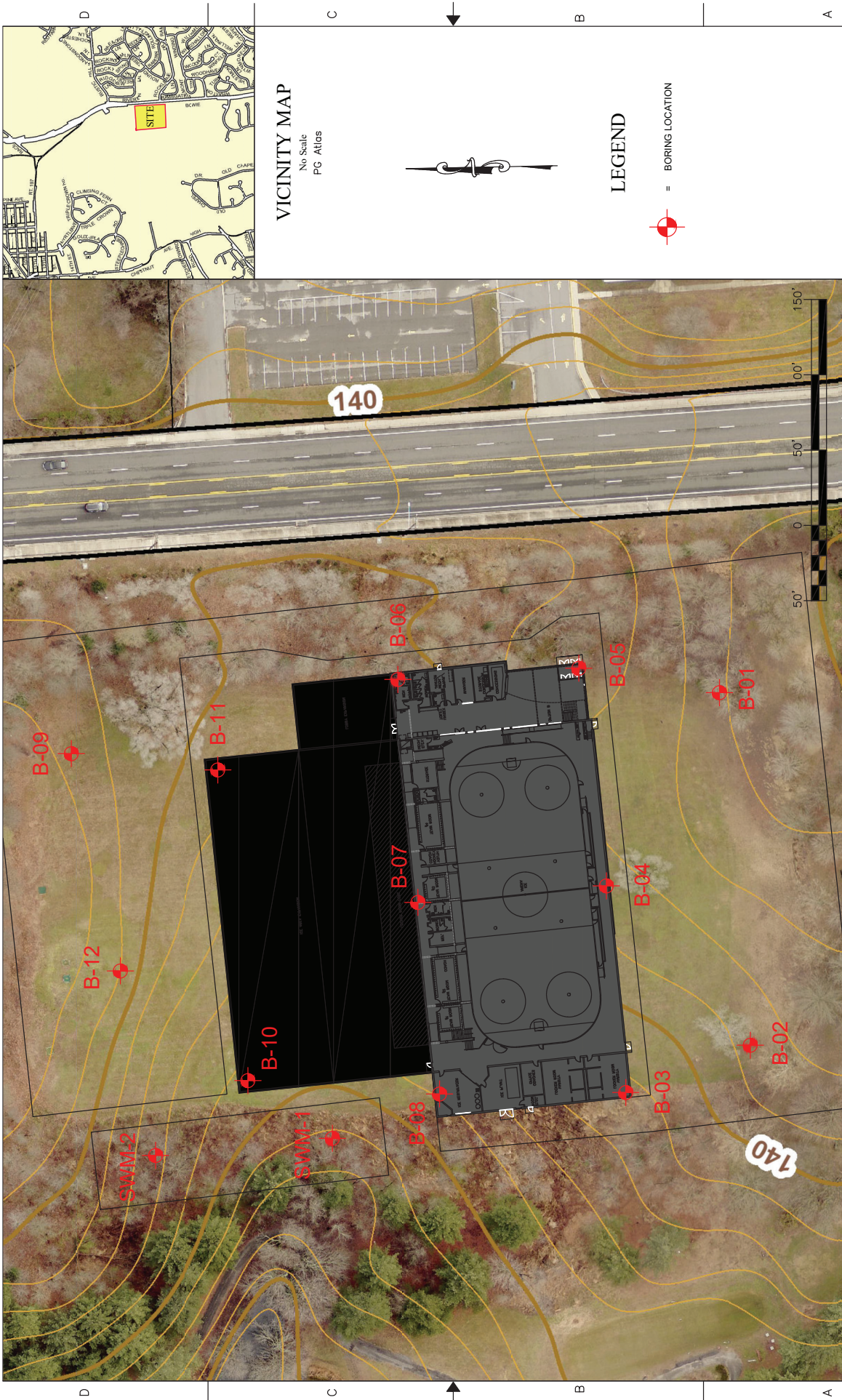
Specialized Engineering recommends that the project specifications contain a statement indicating that this report is for informational purposes only and should not be considered part of the contract documents. The data contained in this report may not be adequate for the Contractors' particular needs, in which case the Contractors should make their own tests and analyses prior to bidding the work or preparing proposals associated with the proposed construction. Contractors may not rely on this report to assess field

conditions other than those specifically addressed in the evaluations and recommendations presented in this report. Field conditions could be more difficult than Contractors anticipate and, therefore, should be directly observed and evaluated by the Contractor.

APPENDIX A

BORING LOCATION PLAN





VICINITY MAP
No Scale
PG Atlas

LEGEND



= BORING LOCATION

BASE DRAWING PROVIDED BY: FREDERICK WARD ASSOCIATES DECEMBER 16, 2021		218736 SPECIALIZED ENGINEERING PROJECT NO: BOWIE ICE ARENA LAUREL BOWIE ROAD BOWIE, MARYLAND		 SPECIALIZED ENGINEERING <i>Consulting and Engineering</i> 4845 Frederick Road, Suite 104, Frederick, MD 21708 Phone: 301-697-4188 Fax: 301-662-6122		SPECIALIZED ENGINEERING FREDERICK, MD	
						BORING LOCATION PLAN	
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APPENDIX B

TEST BORING LOGS



CLIENT Frederick Ward Associates

PROJECT NAME Bowie Ice Arena

PROJECT NUMBER 218736

PROJECT LOCATION Laurel Bowie Road, Bowie, MD

DATE STARTED 12/23/21

COMPLETED 12/23/21

GROUND ELEVATION 147.9 ft

HOLE SIZE 3.25 in.

DRILLING CONTRACTOR Connelly and Associates Inc

GROUND WATER LEVELS:

DRILLING METHOD HSA

AT TIME OF DRILLING None

LOGGED BY C. Seong

CHECKED BY I. Helms

AT END OF DRILLING None

NOTES Cave-in = 3 ft

AFTER DRILLING None, Backfilled upon completion

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft)	RECOVERY %	BLOW COUNTS (N VALUE)	% < #4 SIEVE	% < #200 SIEVE	▲ SPT N VALUE ▲			
										PL MC LL			
										20	40	60	80
			TOPSOIL: (3 in)	X SS S-01	0.0 1.5	56	2-2-2 (4)						
			SAND: reddish brown, fine to medium grained, moist, very loose, (SP)										
145			Loose	X SS S-02	2.5 4.0	89	2-3-4 (7)						
5			SILTY SAND: pale reddish brown, fine to medium grained, moist, loose, (SM)	X SS S-03	5.0 6.5	100	2-2-4 (6)						
140			Reddish brown with orangish brown, fine to coarse grained	X SS S-04	8.5 10.0	100	4-3-4 (7)						
10			End of boring at 10.0 feet.										

SPECIALIZED ENGINEERING

Construction Quality Control • Environmental Consulting
Geotechnical & Forensic Engineering

BORING NUMBER B-02

PAGE 1 OF 1

CLIENT Frederick Ward Associates

PROJECT NAME Bowie Ice Arena

PROJECT NUMBER 218736

PROJECT LOCATION Laurel Bowie Road, Bowie, MD

DATE STARTED 12/23/21

COMPLETED 12/23/21

GROUND ELEVATION 142.8 ft

HOLE SIZE 3.25 in.

DRILLING CONTRACTOR Connelly and Associates Inc

GROUND WATER LEVELS:

DRILLING METHOD HSA

AT TIME OF DRILLING None

LOGGED BY C. Seong

CHECKED BY I. Helms

AT END OF DRILLING None

NOTES Cave-in = 4 ft

AFTER DRILLING None, Backfilled upon completion

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft)	RECOVERY %	BLOW COUNTS (N VALUE)	% < #4 SIEVE	% < #200 SIEVE	▲ SPT N VALUE ▲			
										PL MC LL			
										20 40 60 80			
			TOPSOIL: (4 in)	X SS S-01	0.0 1.5	56	1-2-2 (4)						
			SANDY LEAN CLAY: reddish brown, moist, soft, (CL)										
140			SAND: pale reddish brown, fine to coarse grained, moist, medium dense, (SW)	X SS S-02	2.5 4.0	89	5-8-6 (14)						
5			SAND: white, fine to medium grained, moist, medium dense, (SP)	X SS S-03	5.0 6.5	100	5-7-7 (14)						
135													
10				X SS S-04	8.5 10.0	100	4-6-8 (14)						
			End of boring at 10.0 feet.										

GEOTECH BH PLOTS 218736 BOWIE ICE ARENA.GPJ GINT US.GDT 1/20/22

SPECIALIZED ENGINEERING

Construction Quality Control • Environmental Consulting
Geotechnical & Forensic Engineering

BORING NUMBER B-03

PAGE 1 OF 1

CLIENT Frederick Ward Associates

PROJECT NAME Bowie Ice Arena

PROJECT NUMBER 218736

PROJECT LOCATION Laurel Bowie Road, Bowie, MD

DATE STARTED 12/23/21

COMPLETED 12/23/21

GROUND ELEVATION 137.4 ft

HOLE SIZE 3.25 in.

DRILLING CONTRACTOR Connelly and Associates Inc

GROUND WATER LEVELS:

DRILLING METHOD HSA

AT TIME OF DRILLING None

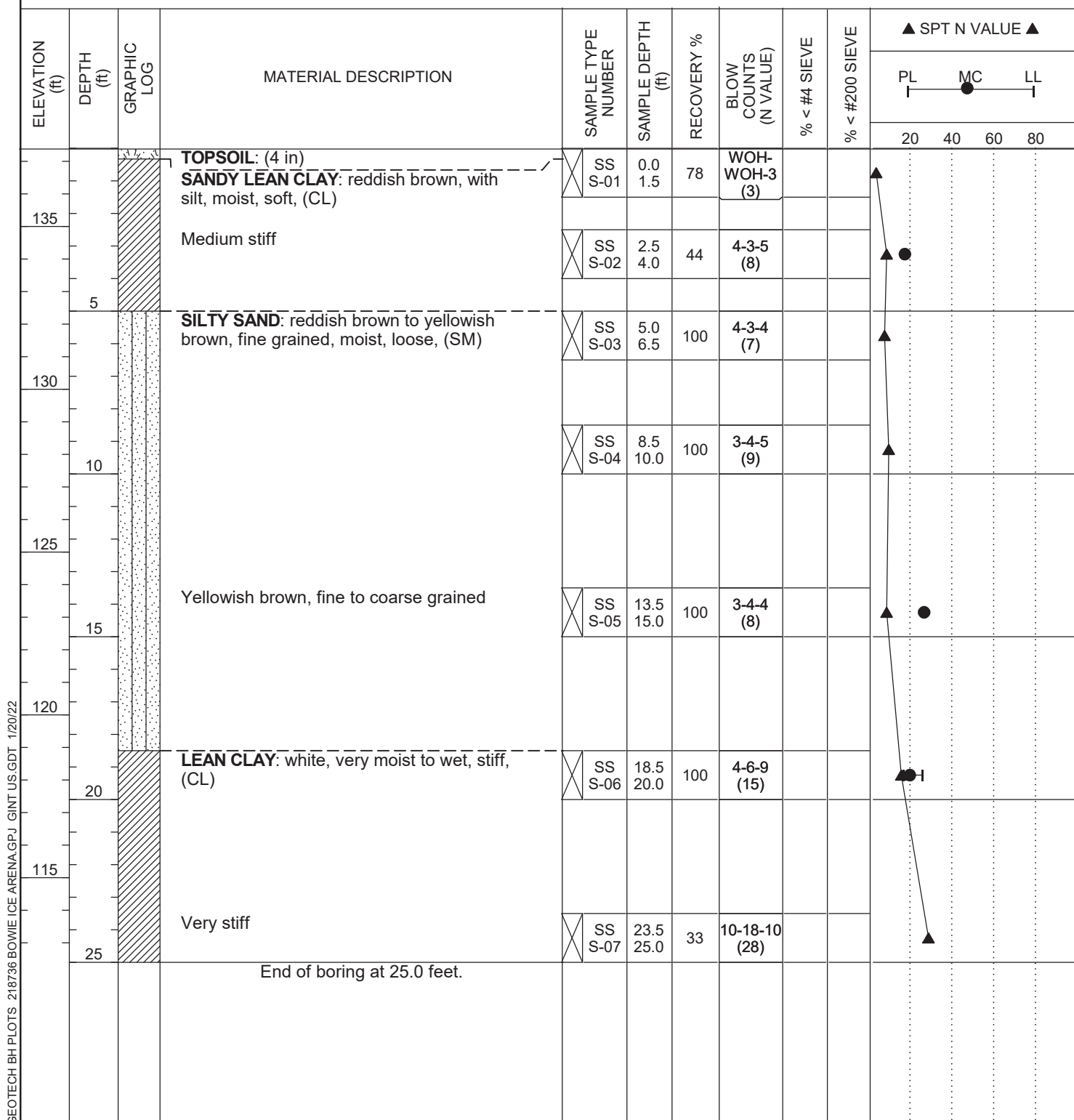
LOGGED BY C. Seong

CHECKED BY I. Helms

AT END OF DRILLING None

NOTES Cave-in = 11 ft

AFTER DRILLING None, Backfilled upon completion



GEOTECH BH PLOTS 218736 BOWIE ICE ARENA.GPJ GINT US.GDT 1/20/22

SPECIALIZED ENGINEERING

Construction Quality Control • Environmental Consulting
Geotechnical & Forensic Engineering

BORING NUMBER B-04

PAGE 1 OF 1

CLIENT Frederick Ward Associates

PROJECT NAME Bowie Ice Arena

PROJECT NUMBER 218736

PROJECT LOCATION Laurel Bowie Road, Bowie, MD

DATE STARTED 12/23/21

COMPLETED 12/23/21

GROUND ELEVATION 144.7 ft

HOLE SIZE 3.25 in.

DRILLING CONTRACTOR Connelly and Associates Inc

GROUND WATER LEVELS:

DRILLING METHOD HSA

AT TIME OF DRILLING None

LOGGED BY C. Seong

CHECKED BY I. Helms

AT END OF DRILLING None

NOTES Cave-in = 12.5 ft

AFTER DRILLING None, Backfilled upon completion

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft)	RECOVERY %	BLOW COUNTS (N VALUE)	% < #4 SIEVE	% < #200 SIEVE	▲ SPT N VALUE ▲			
										PL MC LL			
										20 40 60 80			
			TOPSOIL: (3 in)	X SS S-01	0.0 1.5	67	WOH- WOH-1 (1)						
			CLAYEY SAND: dark reddish brown, fine to medium grained, moist, very loose, (SC)										
			SILTY SAND: light orangish brown with reddish brown, moist, loose, (SM)	X SS S-02	2.5 4.0	100	2-4-6 (10)						
140	5		SAND: light orangish brown with reddish brown, fine to coarse grained, some silt, moist, loose, (SW)	X SS S-03	5.0 6.5	67	3-4-6 (10)						
			Medium dense										
135	10			X SS S-04	8.5 10.0	100	4-5-6 (11)						
130	15			X SS S-05	13.5 15.0	100	4-5-16 (21)						
125	20			X SS S-06	18.5 20.0	100	5-10-11 (21)						
120	25		SILT: white, some fine sand, moist, stiff, (ML)	X SS S-07	23.5 25.0	100	4-5-6 (11)						
			End of boring at 25.0 feet.										

GEOTECH BH PLOTS 218736 BOWIE ICE ARENA.GPJ GINT US.GDT 1/20/22

SPECIALIZED ENGINEERING

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BORING NUMBER B-05

PAGE 1 OF 1

CLIENT Frederick Ward Associates

PROJECT NAME Bowie Ice Arena

PROJECT NUMBER 218736

PROJECT LOCATION Laurel Bowie Road, Bowie, MD

DATE STARTED 12/23/21

COMPLETED 12/23/21

GROUND ELEVATION 143.3 ft

HOLE SIZE 3.25 in.

DRILLING CONTRACTOR Connelly and Associates Inc

GROUND WATER LEVELS:

DRILLING METHOD HSA

AT TIME OF DRILLING None

LOGGED BY C. Seong

CHECKED BY I. Helms

AT END OF DRILLING None

NOTES Cave-in = 12 ft

AFTER DRILLING None, Backfilled upon completion

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft)	RECOVERY %	BLOW COUNTS (N VALUE)	% < #4 SIEVE	% < #200 SIEVE	▲ SPT N VALUE ▲			
										PL MC LL			
										20	40	60	80
			TOPSOIL: (4 in)	X SS S-01	0.0 1.5	44	WOH-1-2 (3)						
			SAND: dark brown, fine to medium grained, with clay, moist, very loose, (SP-SC)										
140	5		SAND: brownish orange, fine to coarse grained, moist, medium dense, (SW)	X SS S-02	2.5 4.0	100	4-5-6 (11)						
			SILT: white, moist, stiff, (ML)	X SS S-03	5.0 6.5	100	3-5-6 (11)						
135	10		SAND: white and orangish brown, fine grained, with silt, moist, loose, (SP-SM)	X SS S-04	8.5 10.0	100	3-3-5 (8)	100.0	10.8				
130	15			X SS S-05	13.5 15.0	100	2-4-5 (9)						
125	20		Fine to coarse grained, medium dense	X SS S-06	18.5 20.0	100	5-6-8 (14)						
120	25		SILT: white, moist, stiff, (ML)	X SS S-07	23.5 25.0	100	2-5-6 (11)						
			End of boring at 25.0 feet.										

GEOTECH BH PLOTS 218736 BOWIE ICE ARENA.GPJ GINT US.GDT 1/20/22

SPECIALIZED ENGINEERING

Construction Quality Control • Environmental Consulting
Geotechnical & Forensic Engineering

BORING NUMBER B-06

PAGE 1 OF 1

CLIENT Frederick Ward Associates

PROJECT NAME Bowie Ice Arena

PROJECT NUMBER 218736

PROJECT LOCATION Laurel Bowie Road, Bowie, MD

DATE STARTED 12/27/21 COMPLETED 12/27/21

GROUND ELEVATION 139.4 ft HOLE SIZE 3.25 in.

DRILLING CONTRACTOR Connelly and Associates Inc

GROUND WATER LEVELS:

DRILLING METHOD HSA

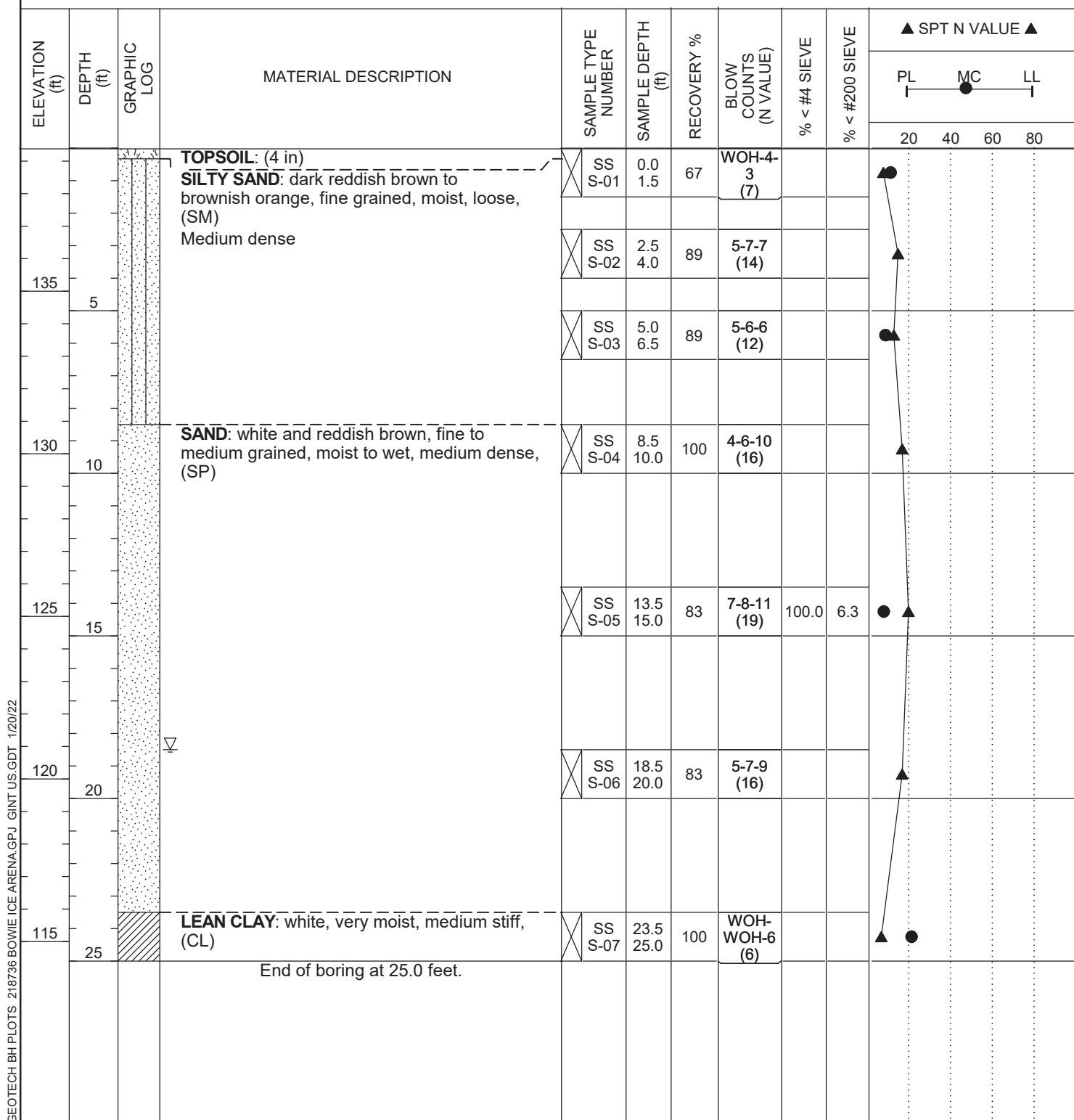
▽ AT TIME OF DRILLING 18.5 ft / Elev 120.9 ft

LOGGED BY C. Seong CHECKED BY I. Helms

AT END OF DRILLING None

NOTES Cave-in = 9 ft

0hrs AFTER DRILLING None, Backfilled upon completion



GEOTECH BH PLOTS 218736 BOWIE ICE ARENA.GPJ GINT US.GDT 1/20/22

SPECIALIZED ENGINEERING

Construction Quality Control • Environmental Consulting
Geotechnical & Forensic Engineering

BORING NUMBER B-07

PAGE 1 OF 1

CLIENT Frederick Ward Associates

PROJECT NAME Bowie Ice Arena

PROJECT NUMBER 218736

PROJECT LOCATION Laurel Bowie Road, Bowie, MD

DATE STARTED 12/23/21 COMPLETED 12/23/21

GROUND ELEVATION 135.9 ft HOLE SIZE 3.25 in.

DRILLING CONTRACTOR Connelly and Associates Inc

GROUND WATER LEVELS:

DRILLING METHOD HSA

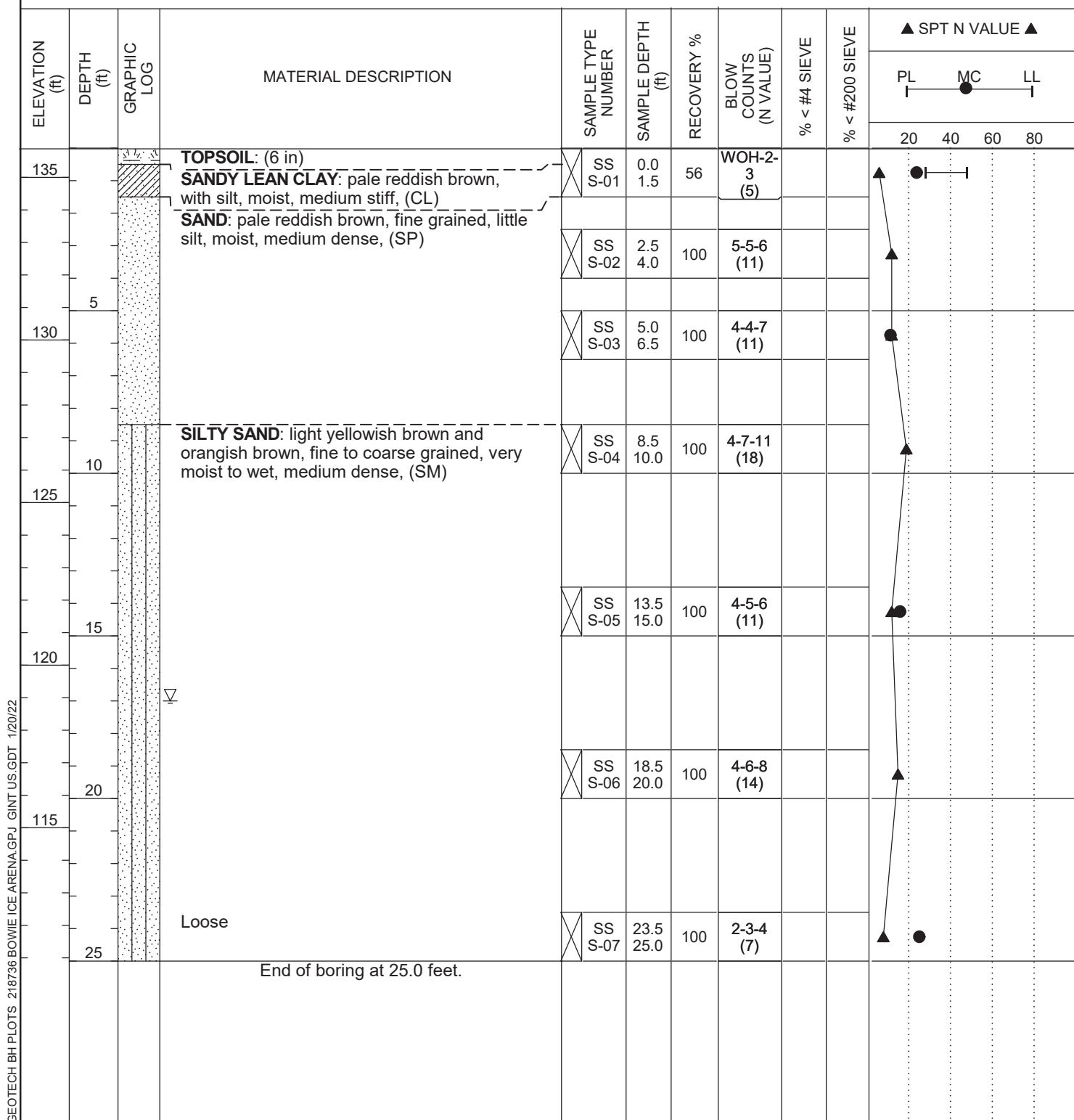
▽ AT TIME OF DRILLING 17.0 ft / Elev 118.9 ft

LOGGED BY C. Seong CHECKED BY I. Helms

AT END OF DRILLING None

NOTES Cave-in = not checked

0hrs AFTER DRILLING None, Backfilled upon completion



GEOTECH BH PLOTS 218736 BOWIE ICE ARENA.GPJ GINT US.GDT 1/20/22

SPECIALIZED ENGINEERING

Construction Quality Control • Environmental Consulting
Geotechnical & Forensic Engineering

BORING NUMBER B-08

PAGE 1 OF 1

CLIENT Frederick Ward Associates

PROJECT NAME Bowie Ice Arena

PROJECT NUMBER 218736

PROJECT LOCATION Laurel Bowie Road, Bowie, MD

DATE STARTED 12/22/21 COMPLETED 12/22/21

GROUND ELEVATION 131.8 ft HOLE SIZE 3.25 in.

DRILLING CONTRACTOR Connelly and Associates Inc

GROUND WATER LEVELS:

DRILLING METHOD HSA

▽ AT TIME OF DRILLING 13.5 ft / Elev 118.3 ft

LOGGED BY C. Seong CHECKED BY I. Helms

▼ AT END OF DRILLING 23.0 ft / Elev 108.8 ft

NOTES Cave-in = 6.5 ft

0hrs AFTER DRILLING None, Backfilled upon completion

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft)	RECOVERY %	BLOW COUNTS (N VALUE)	% < #4 SIEVE	% < #200 SIEVE	▲ SPT N VALUE ▲			
										PL MC LL			
										20 40 60 80			
130			TOPSOIL: (4 in)	SS S-01	0.0 1.5	83	1-1-2 (3)						
			SANDY LEAN CLAY: reddish brown, little organics, moist, soft, (CL)										
	5		SAND: orangish brown, fine grained, moist, loose, (SP)	SS S-02	2.5 4.0	44	3-4-4 (8)						
125			CLAYEY SAND: reddish brown, fine to coarse grained, moist to wet, loose, (SC)	SS S-03	5.0 6.5	100	3-3-4 (7)						
	10			SS S-04	8.5 10.0	100	4-5-5 (10)						
120													
	15			SS S-05	13.5 15.0	100	4-5-3 (8)						
115													
	20		SILT: grayish white, moist, stiff, (ML)	SS S-06	18.5 20.0	100	4-4-6 (10)						
110													
	25		SAND: yellowish brown with orangish brown, fine to medium grained, wet, loose, (SW)	SS S-07	23.5 25.0	100	3-1-4 (5)						
			End of boring at 25.0 feet.										

GEOTECH BH PLOTS 218736 BOWIE ICE ARENA.GPJ GINT US.GDT 1/20/22

SPECIALIZED ENGINEERING

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BORING NUMBER B-09

PAGE 1 OF 1

CLIENT Frederick Ward Associates

PROJECT NAME Bowie Ice Arena

PROJECT NUMBER 218736

PROJECT LOCATION Laurel Bowie Road, Bowie, MD

DATE STARTED 12/27/21

COMPLETED 12/27/21

GROUND ELEVATION 142.8 ft

HOLE SIZE 3.25 in.

DRILLING CONTRACTOR Connelly and Associates Inc

GROUND WATER LEVELS:

DRILLING METHOD HSA

AT TIME OF DRILLING None

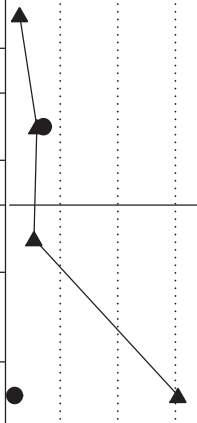
LOGGED BY C. Seong

CHECKED BY I. Helms

AT END OF DRILLING None

NOTES Cave-in = 4 ft

AFTER DRILLING None, Backfilled upon completion

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft)	RECOVERY %	BLOW COUNTS (N VALUE)	% < #4 SIEVE	% < #200 SIEVE	▲ SPT N VALUE ▲		
										PL	MC	LL
										20	40	60
140	5		TOPSOIL: (5 in) CLAYEY SAND: reddish brown, fine grained, some organics, moist, loose, (SC)	X SS S-01	0.0 1.5	83	2-2-3 (5)					
			SILTY SAND: orangish brown with reddish brown, fine grained, moist, medium dense, (SM)	X SS S-02	2.5 4.0	100	2-2-9 (11)	91.3	33.8			
			SILT: white, moist, stiff, (ML)	X SS S-03	5.0 6.5	100	6-5-5 (10)					
			SAND: white, fine to medium grained, moist, very dense, (SP)	X SS S-04	8.5 10.0	100	18-28-32 (60)					
135	10		End of boring at 10.0 feet.									

GEOTECH BH PLOTS 218736 BOWIE ICE ARENA.GPJ GINT US.GDT 1/20/22

SPECIALIZED ENGINEERING

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BORING NUMBER B-10

PAGE 1 OF 1

CLIENT Frederick Ward Associates

PROJECT NAME Bowie Ice Arena

PROJECT NUMBER 218736

PROJECT LOCATION Laurel Bowie Road, Bowie, MD

DATE STARTED 12/22/21 COMPLETED 12/22/21

GROUND ELEVATION 131.2 ft HOLE SIZE 3.25 in.

DRILLING CONTRACTOR Connelly and Associates Inc

GROUND WATER LEVELS:

DRILLING METHOD HSA

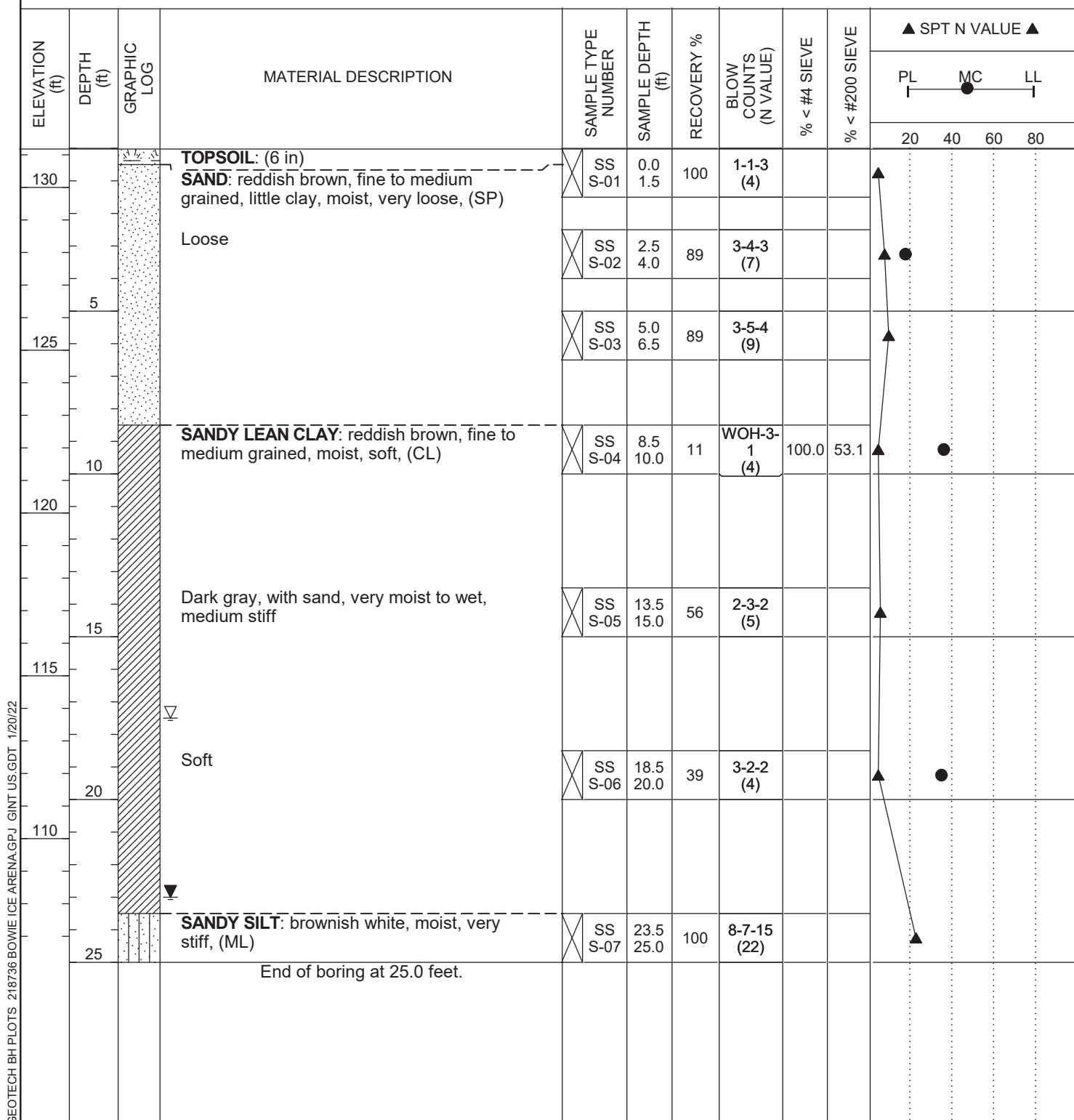
▽ AT TIME OF DRILLING 17.5 ft / Elev 113.7 ft

LOGGED BY C. Seong CHECKED BY I. Helms

▼ AT END OF DRILLING 23.0 ft / Elev 108.2 ft

NOTES Cave-in = 4 ft

0hrs AFTER DRILLING None, Backfilled upon completion



GEOTECH BH PLOTS 218736 BOWIE ICE ARENA.GPJ GINT US.GDT 1/20/22

SPECIALIZED ENGINEERING

Construction Quality Control • Environmental Consulting
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BORING NUMBER B-11

PAGE 1 OF 1

CLIENT Frederick Ward Associates

PROJECT NAME Bowie Ice Arena

PROJECT NUMBER 218736

PROJECT LOCATION Laurel Bowie Road, Bowie, MD

DATE STARTED 12/27/21 COMPLETED 12/27/21

GROUND ELEVATION 138.8 ft HOLE SIZE 3.25 in.

DRILLING CONTRACTOR Connelly and Associates Inc

GROUND WATER LEVELS:

DRILLING METHOD HSA

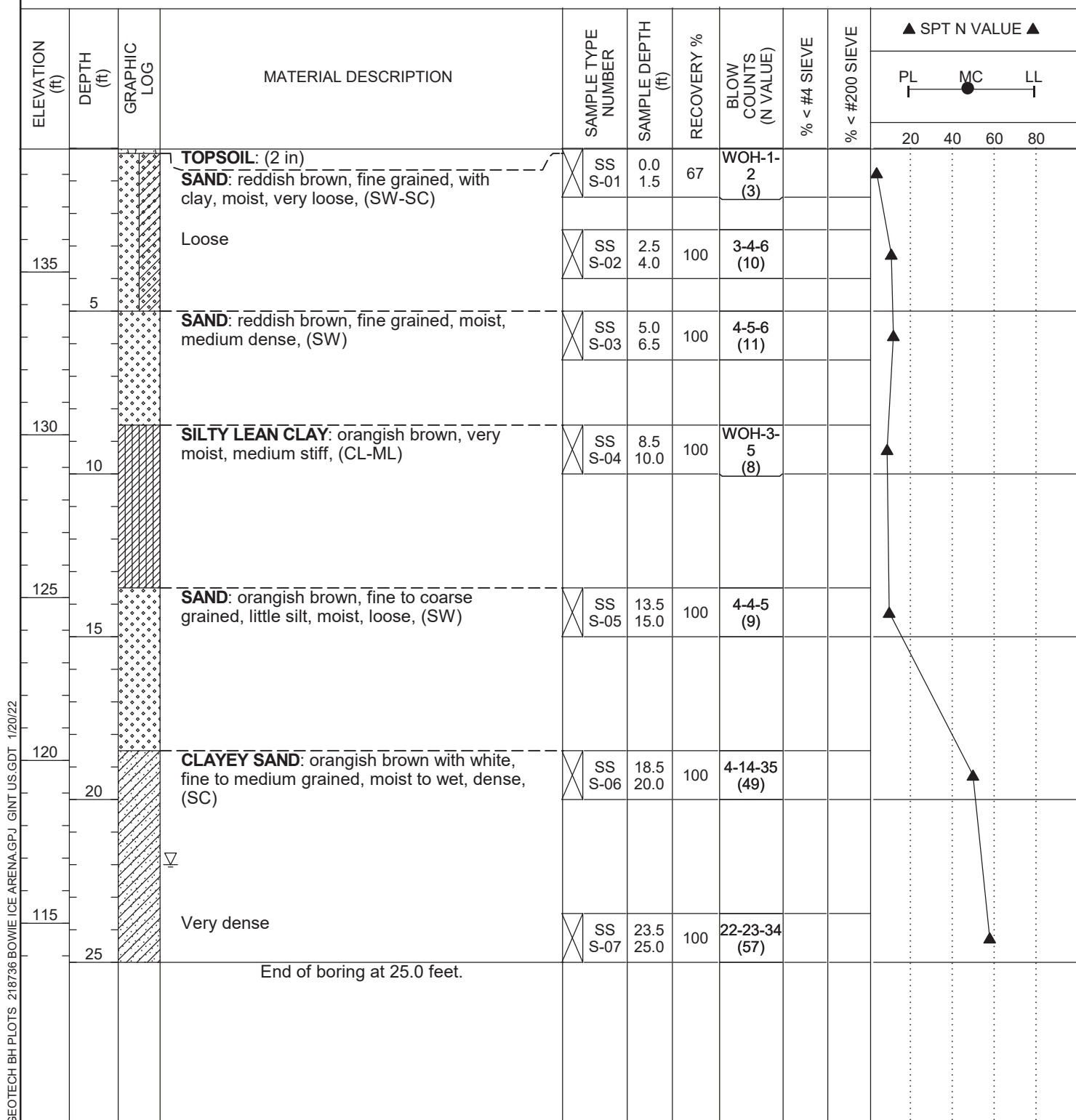
▽ AT TIME OF DRILLING 22.0 ft / Elev 116.8 ft

LOGGED BY C. Seong CHECKED BY I. Helms

AT END OF DRILLING None

NOTES Cave-in = 10 ft

0hrs AFTER DRILLING None, Backfilled upon completion



GEOTECH BH PLOTS 218736 BOWIE ICE ARENA.GPJ GINT US.GDT 1/20/22

SPECIALIZED ENGINEERING

Construction Quality Control • Environmental Consulting
Geotechnical & Forensic Engineering

BORING NUMBER B-12

PAGE 1 OF 1

CLIENT Frederick Ward Associates

PROJECT NAME Bowie Ice Arena

PROJECT NUMBER 218736

PROJECT LOCATION Laurel Bowie Road, Bowie, MD

DATE STARTED 12/27/21

COMPLETED 12/27/21

GROUND ELEVATION 141.9 ft

HOLE SIZE 3.25 in.

DRILLING CONTRACTOR Connelly and Associates Inc

GROUND WATER LEVELS:

DRILLING METHOD HSA

AT TIME OF DRILLING None

LOGGED BY C. Seong

CHECKED BY I. Helms

AT END OF DRILLING None

NOTES Cave-in = 5.5 ft

AFTER DRILLING None, Backfilled upon completion

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft)	RECOVERY %	BLOW COUNTS (N VALUE)	% < #4 SIEVE	% < #200 SIEVE	▲ SPT N VALUE ▲			
										PL MC LL			
										20	40	60	80
140			TOPSOIL: (2 in)	X SS S-01	0.0 1.5	67	WOH-2-4 (6)						
			CLAYEY SAND: reddish brown, fine grained, some organics, moist, very loose, (SC)										
			SILT: white, moist, medium stiff, (ML)	X SS S-02	2.5 4.0	100	6-4-4 (8)						
5													
135			CLAYEY SAND: reddish brown, fine to medium grained, moist, loose, (SC)	X SS S-03	5.0 6.5	100	4-4-5 (9)						
10			SAND: reddish brown with white, fine to medium grained, moist, medium dense, (SP)	X SS S-04	8.5 10.0	100	9-14-14 (28)						
			End of boring at 10.0 feet.										

GEOTECH BH PLOTS 218736 BOWIE ICE ARENA.GPJ GINT US.GDT 1/20/22

SPECIALIZED ENGINEERING

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BORING NUMBER SWM-01

PAGE 1 OF 1

CLIENT Frederick Ward Associates

PROJECT NAME Bowie Ice Arena

PROJECT NUMBER 218736

PROJECT LOCATION Laurel Bowie Road, Bowie, MD

DATE STARTED 12/22/21

COMPLETED 12/22/21

GROUND ELEVATION 127.2 ft

HOLE SIZE 3.25 in.

DRILLING CONTRACTOR Connelly and Associates Inc

GROUND WATER LEVELS:

DRILLING METHOD HSA

▽ AT TIME OF DRILLING 7.0 ft / Elev 120.2 ft

LOGGED BY J. Cook

CHECKED BY I. Helms

▼ AT END OF DRILLING 12.0 ft / Elev 115.2 ft

NOTES Cave-in = 6 ft

0hrs AFTER DRILLING None, Backfilled upon completion

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft)	RECOVERY %	BLOW COUNTS (N VALUE)	% < #4 SIEVE	% < #200 SIEVE	▲ SPT N VALUE ▲			
										PL MC LL			
										20 40 60 80			
125			TOPSOIL: (4 in) SAND: reddish brown, fine grained, with clay, trace mica, moist, loose, (SP-SC)	SS S-01	0.0 1.5	89	2-3-3 (6)						
			Grayish brown	SS S-02	2.5 4.0	67	4-4-6 (10)						
5			SAND: yellowish brown, fine grained, with silt, moist, medium dense, (SP-SM)	SS S-03	5.0 6.5	89	4-5-6 (11)	99.4	10.5				
120			White and yellowish brown, moist to wet	SS S-04	8.5 10.0	67	5-6-7 (13)						
10			Yellowish brown, wet, loose	SS S-05	11.0 12.5	100	5-3-7 (10)						
115				SS S-06	13.5 15.0	100	3-4-5 (9)						
15			End of boring at 15.0 feet.										

GEOTECH BH PLOTS 218736 BOWIE ICE ARENA.GPJ GINT US.GDT 1/20/22

SPECIALIZED ENGINEERING

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BORING NUMBER SWM-02

PAGE 1 OF 1

CLIENT Frederick Ward Associates

PROJECT NAME Bowie Ice Arena

PROJECT NUMBER 218736

PROJECT LOCATION Laurel Bowie Road, Bowie, MD

DATE STARTED 12/22/21

COMPLETED 12/22/21

GROUND ELEVATION 134.1 ft

HOLE SIZE 3.25 in.

DRILLING CONTRACTOR Connelly and Associates Inc

GROUND WATER LEVELS:

DRILLING METHOD HSA

AT TIME OF DRILLING None

LOGGED BY J. Cook

CHECKED BY I. Helms

AT END OF DRILLING None

NOTES Cave-in = 6 ft

AFTER DRILLING None, Backfilled upon completion

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft)	RECOVERY %	BLOW COUNTS (N VALUE)	% < #4 SIEVE	% < #200 SIEVE	▲ SPT N VALUE ▲			
										PL MC LL			
										20 40 60 80			
			TOPSOIL: (4 in)	X SS S-01	0.0 1.5	67	2-2-3 (5)						
			SAND: brown and reddish brown, fine grained, with clay, trace organics, moist, loose, (SP-SC) No organics	X SS S-02	2.5 4.0	100	3-3-4 (7)						
130	5			X SS S-03	5.0 6.5	78	3-4-4 (8)						
			SAND: gray and brown, fine grained, with silt, moist, medium dense, (SP-SM)	X SS S-04	8.5 10.0	100	4-4-7 (11)						
125	10		Gray	X SS S-05	11.0 12.5	89	3-4-9 (13)	100.0	10.8				
			SILTY GRAVEL: reddish brown and dark brown, fine to medium grained, trace rock fragments, moist, medium dense, (GM)	X SS S-06	13.5 15.0	78	7-9-4 (13)						
120	15		End of boring at 15.0 feet.										

GEOTECH BH PLOTS 218736 BOWIE ICE ARENA.GPJ GINT US.GDT 1/20/22

APPENDIX C

LABORATORY TEST RESULTS



CLIENT Frederick Ward Associates

PROJECT NAME Bowie Ice Arena

PROJECT NUMBER 218736

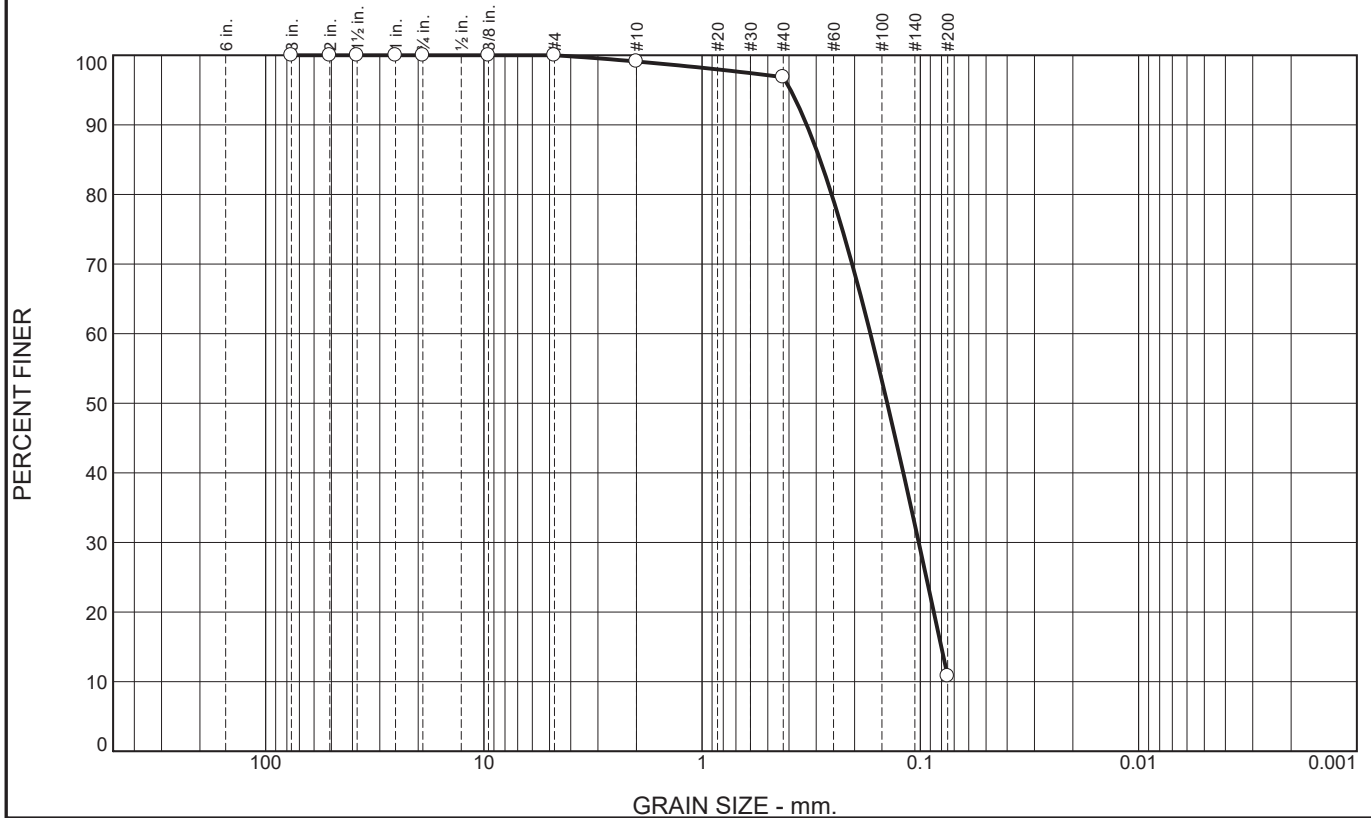
PROJECT LOCATION Laurel Bowie Road, Bowie, MD

Borehole	Depth (ft)	Classification	Liquid Limit	Plastic Limit	Plasticity Index	Moisture Content (%)	% < #4 Sieve	% < #200 Sieve	Other Tests
B-03	2.5					16.8			
B-03	13.5					26			
B-03	18.5		25	16	9	19.2			
B-04	0.0					12.1			
B-04	5.0					5			
B-04	13.5					15.7			
B-04	23.5		39	21	18	18.8			
B-05	8.5	SP				9	100	10.8	
B-05	18.5					8.5			
B-06	0.0					10.6			
B-06	5.0					8.1			
B-06	13.5	SP				7.3	100	6.3	
B-06	23.5					20.6			
B-07	0.0		47	27	20	23			
B-07	5.0					10.5			
B-07	13.5					15.1			
B-07	23.5					24.3			
B-09	2.5	SM				13.4	91.3	33.8	
B-09	8.5					3.4			
B-10	2.5					17.1			
B-10	8.5					35.4	100	53.1	
B-10	18.5					34.3			
B-12	0.0					13.4			
B-12	5.0		21	17	4	8.2			
SWM-01	0.0					12.6			
SWM-01	5.0	SP-SM				6.7	99.4	10.5	
SWM-01	11.0					24.9			
SWM-02	0.0					12.9			
SWM-02	5.0					15.7			
SWM-02	11.0	SP-SM				3.4	100	10.8	

(V) = Visual Classification USCS

TEST SUMMARY 218736 BOWIE ICE ARENA.GPJ GINT US.GDT 1/20/22

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.9	2.2	86.1	10.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3 in.	100.0		
2 in.	100.0		
1 1/2 in.	100.0		
1 in.	100.0		
3/4 in.	100.0		
3/8 in.	100.0		
#4	100.0		
#10	99.1		
#40	96.9		
#200	10.8		

* (no specification provided)

Material Description

PL=

USCS=

Atterberg Limits

LL=

Classification

AASHTO=

Remarks

PI=

Location: B-05, S-04

Sample Number: B-05, S-04

Depth: 8.5'

Date:

**SPECIALIZED
ENGINEERING**
Frederick, Maryland

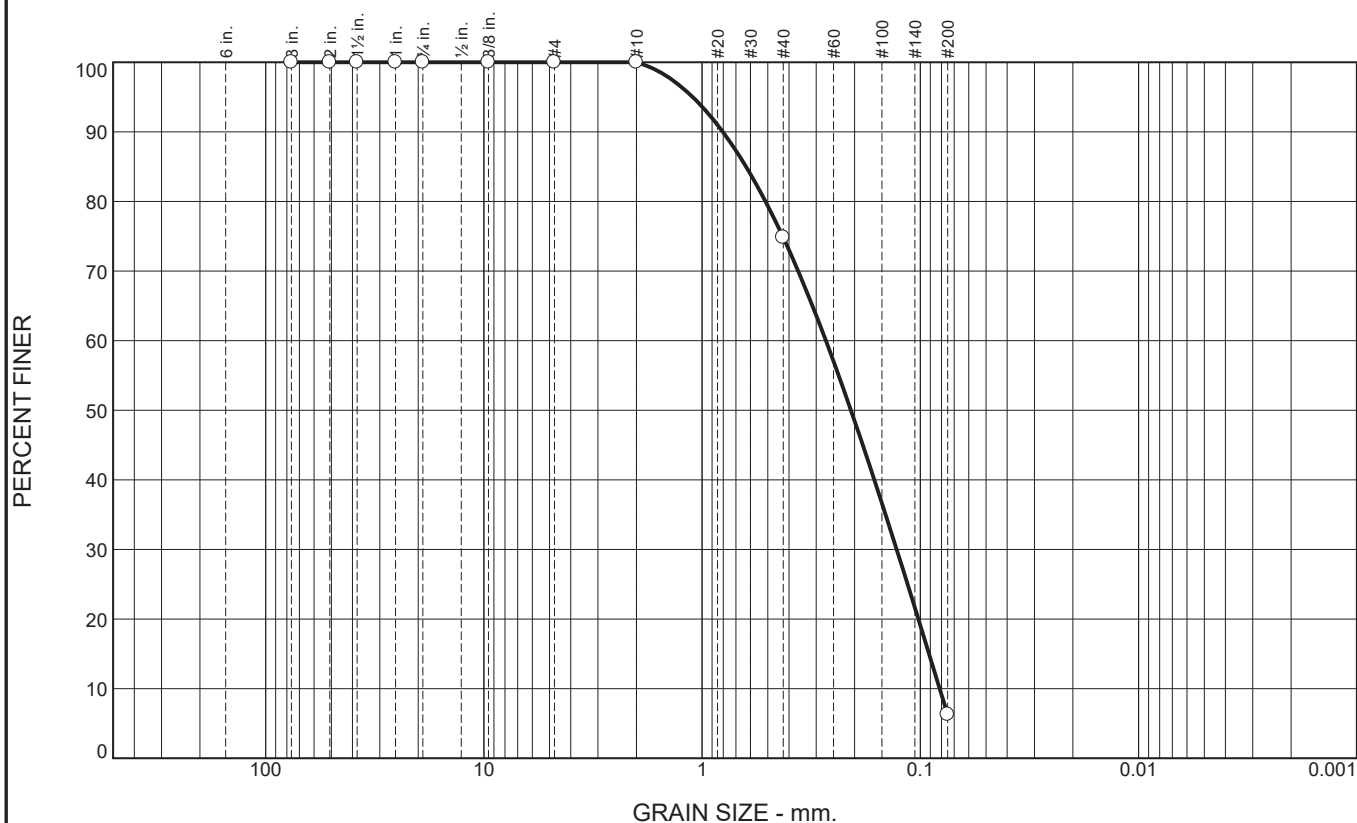
Client: Frederick Ward Associates

Project: Bowie Ice Arena

Project No: 218736

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	25.2	68.5	6.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3 in.	100.0		
2 in.	100.0		
1 1/2 in.	100.0		
1 in.	100.0		
3/4 in.	100.0		
3/8 in.	100.0		
#4	100.0		
#10	100.0		
#40	74.8		
#200	6.3		

* (no specification provided)

Material Description

PL= **Atterberg Limits** PI=

LL=

USCS= **Classification** AASHTO=

Remarks

Location: B-06, S-05

Sample Number: B-06, S-05

Depth: 13.5'

Date:

**SPECIALIZED
ENGINEERING
Frederick, Maryland**

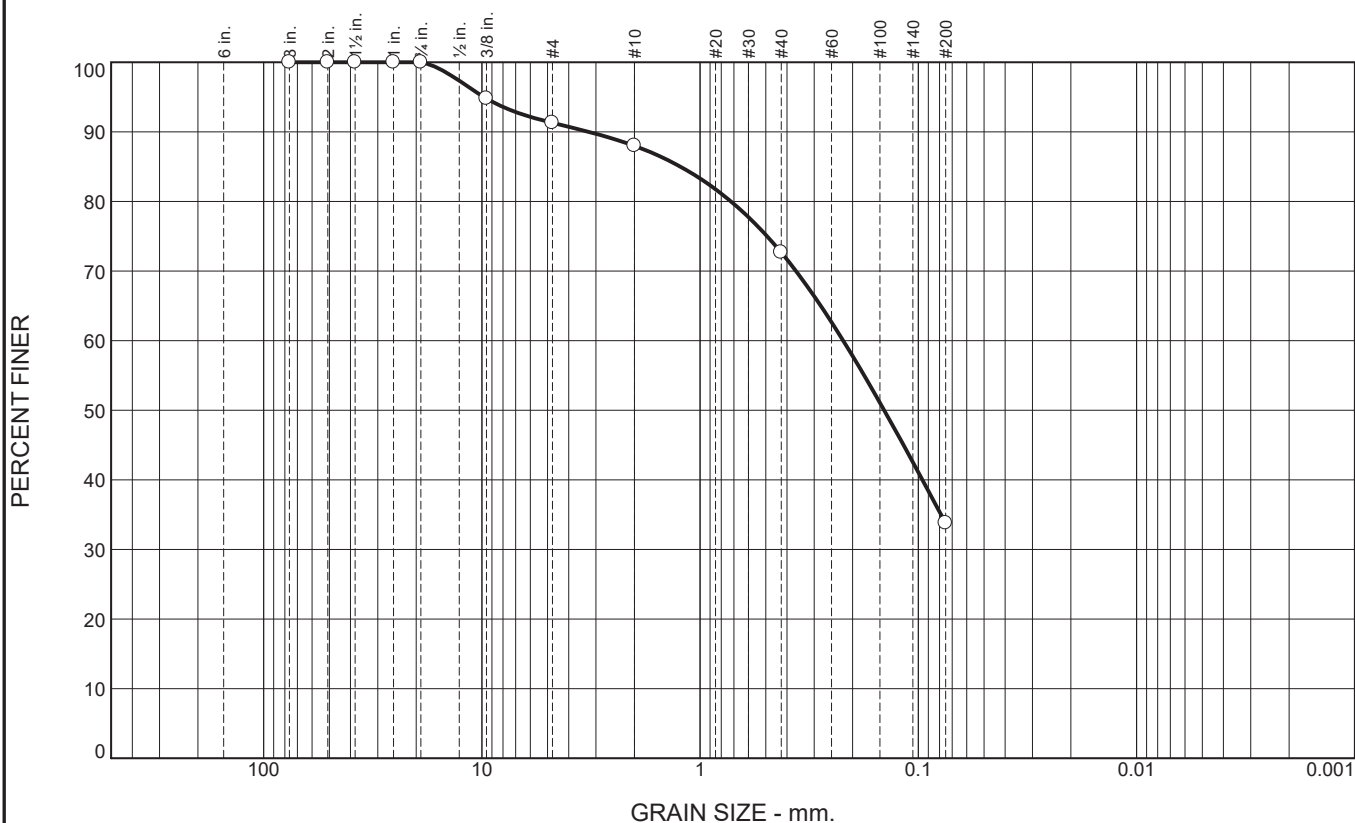
Client: Frederick Ward Associates

Project: Bowie Ice Arena

Project No: 218736

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	8.7	3.3	15.3	38.9	33.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3 in.	100.0		
2 in.	100.0		
1 1/2 in.	100.0		
1 in.	100.0		
3/4 in.	100.0		
3/8 in.	94.8		
#4	91.3		
#10	88.0		
#40	72.7		
#200	33.8		

* (no specification provided)

Material Description

PL= **Atterberg Limits** PI=

USCS= **Classification** AASHTO=

Remarks

Location: B-09, S-02

Sample Number: B-09, S-02

Depth: 2.5'

Date:

**SPECIALIZED
ENGINEERING
Frederick, Maryland**

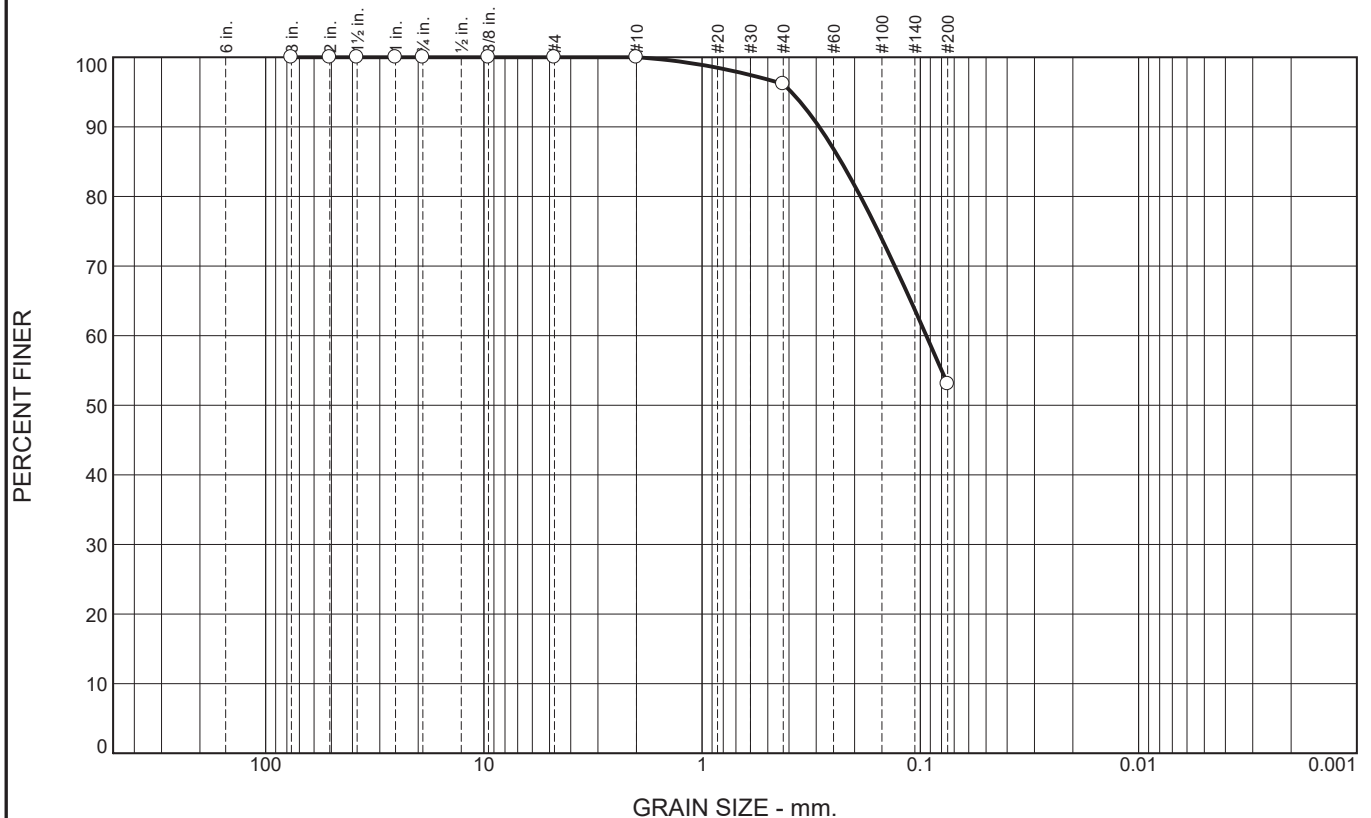
Client: Frederick Ward Associates

Project: Bowie Ice Arena

Project No: 218736

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	3.8	43.1	53.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3 in.	100.0		
2 in.	100.0		
1 1/2 in.	100.0		
1 in.	100.0		
3/4 in.	100.0		
3/8 in.	100.0		
#4	100.0		
#10	100.0		
#40	96.2		
#200	53.1		

* (no specification provided)

Material Description

PL=

USCS=

Atterberg Limits

LL=

Classification

AASHTO=

Remarks

PI=

Location: B-10, S-04

Sample Number: B-10, S-04

Depth: 8.5'

Date:

**SPECIALIZED
ENGINEERING**
Frederick, Maryland

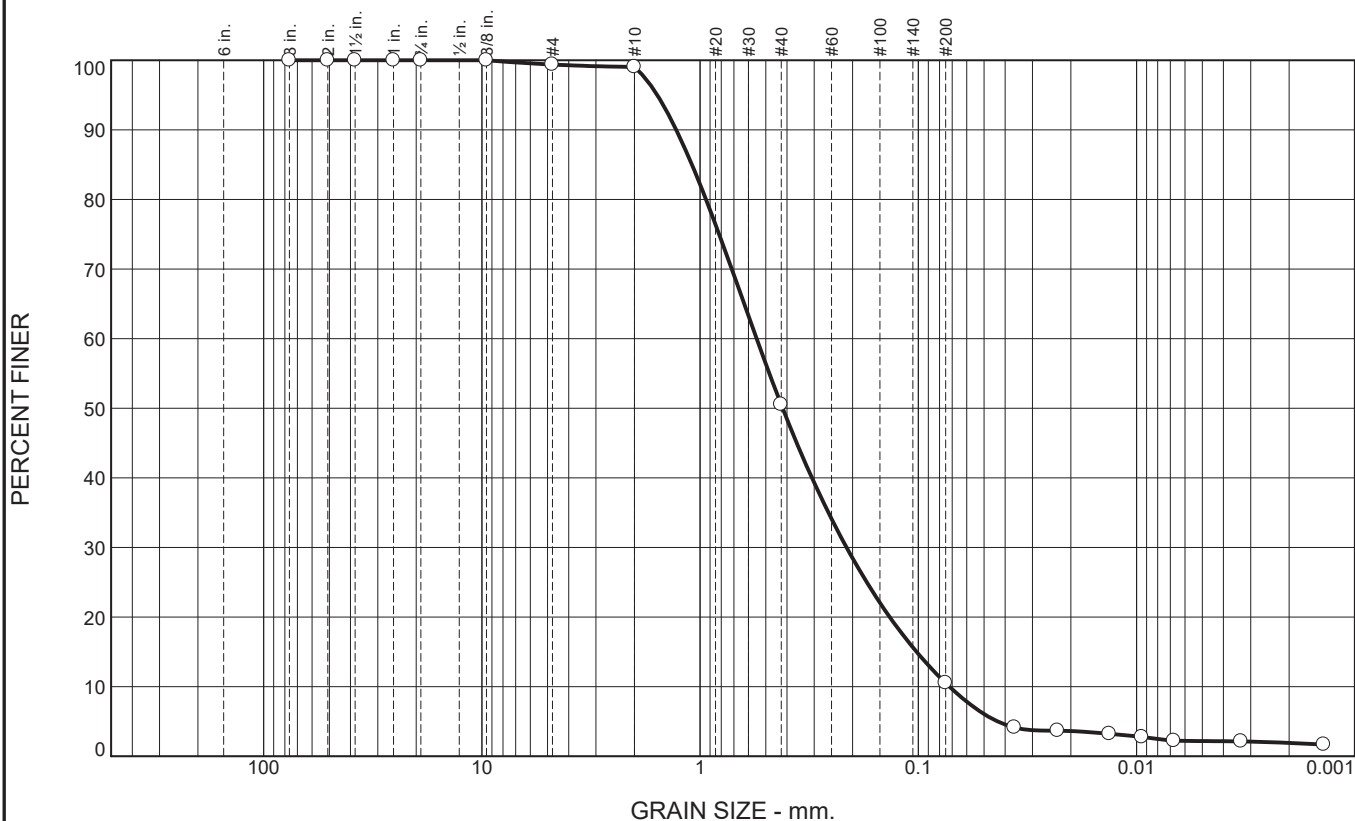
Client: Frederick Ward Associates

Project: Bowie Ice Arena

Project No: 218736

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.6	0.4	48.5	40.0	8.3	2.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3 in.	100.0		
2 in.	100.0		
1 1/2 in.	100.0		
1 in.	100.0		
3/4 in.	100.0		
3/8 in.	100.0		
#4	99.4		
#10	99.0		
#40	50.5		
#200	10.5		

* (no specification provided)

Material Description

PL= **Atterberg Limits** PI=

USCS= **Classification** AASHTO=

Remarks

Location: SWM-01, S-03
Sample Number: SWM-01, S-03

Depth: 5.0'

Date:

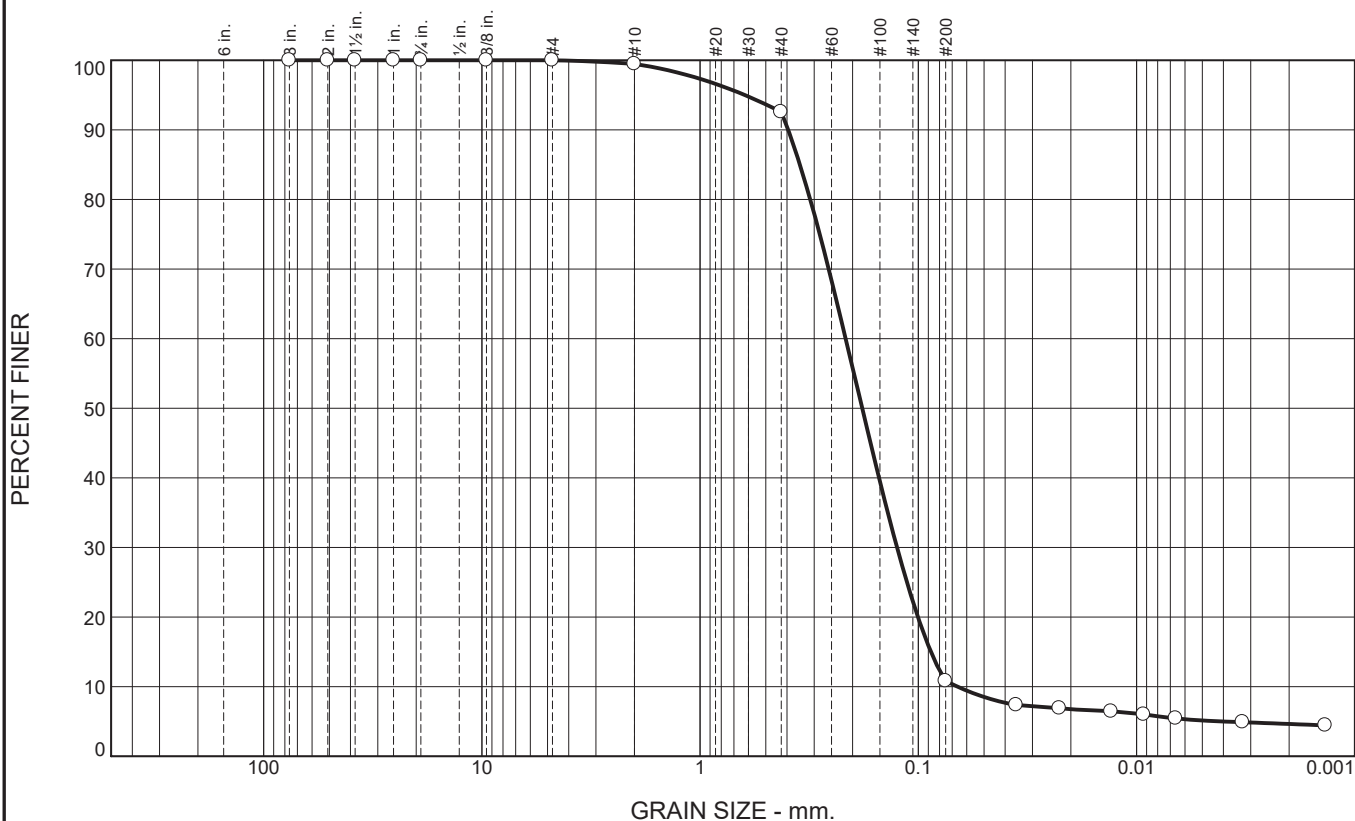
**SPECIALIZED
ENGINEERING
Frederick, Maryland**

Client: Frederick Ward Associates
Project: Bowie Ice Arena

Project No: 218736

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.5	6.9	81.8	5.7	5.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3 in.	100.0		
2 in.	100.0		
1 1/2 in.	100.0		
1 in.	100.0		
3/4 in.	100.0		
3/8 in.	100.0		
#4	100.0		
#10	99.5		
#40	92.6		
#200	10.8		

* (no specification provided)

Material Description

Atterberg Limits
 PL= LL= PI=

Classification
 USCS= AASHTO=

Remarks

Location: SWM-02, S-05
 Sample Number: SWM-02, S-05

Depth: 11.0'

Date:

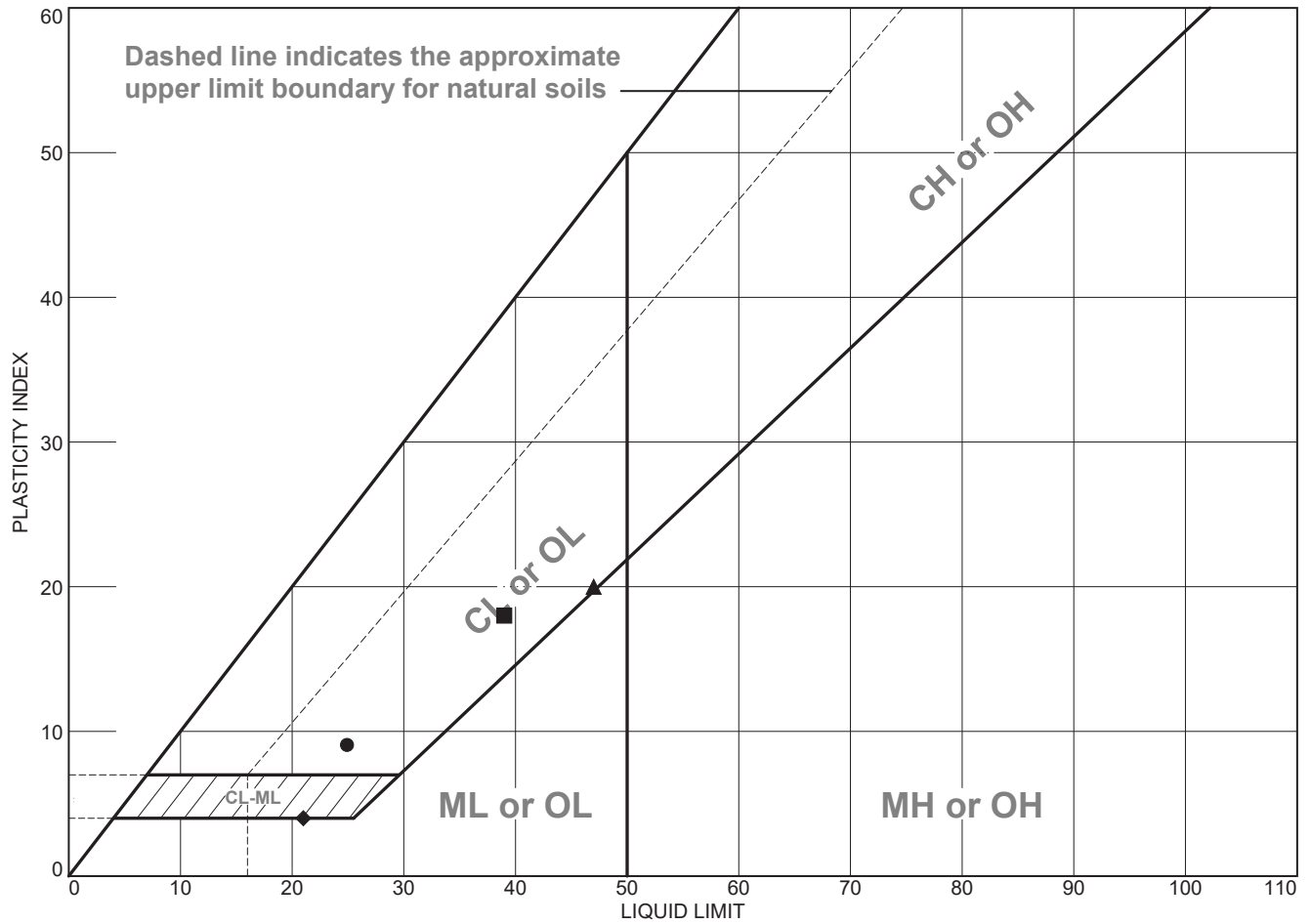
**SPECIALIZED
ENGINEERING**
 Frederick, Maryland

Client: Frederick Ward Associates
 Project: Bowie Ice Arena

Project No: 218736

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●		25	16	9			
■		39	21	18			
▲		47	27	20			
◆		21	17	4			

Project No. 218736

Client: Frederick Ward Associates

Project: Bowie Ice Arena

● **Location:** B-03, S-06

Depth: 18.5'

Sample Number: B-03, S-06

■ **Location:** B-04, S-07

Depth: 23.5'

Sample Number: B-04, S-07

▲ **Location:** B-07, S-01

Depth: 0.0'

Sample Number: B-07, S-01

◆ **Location:** B-12, S-03

Depth: 5.0'

Sample Number: B-12, S-03

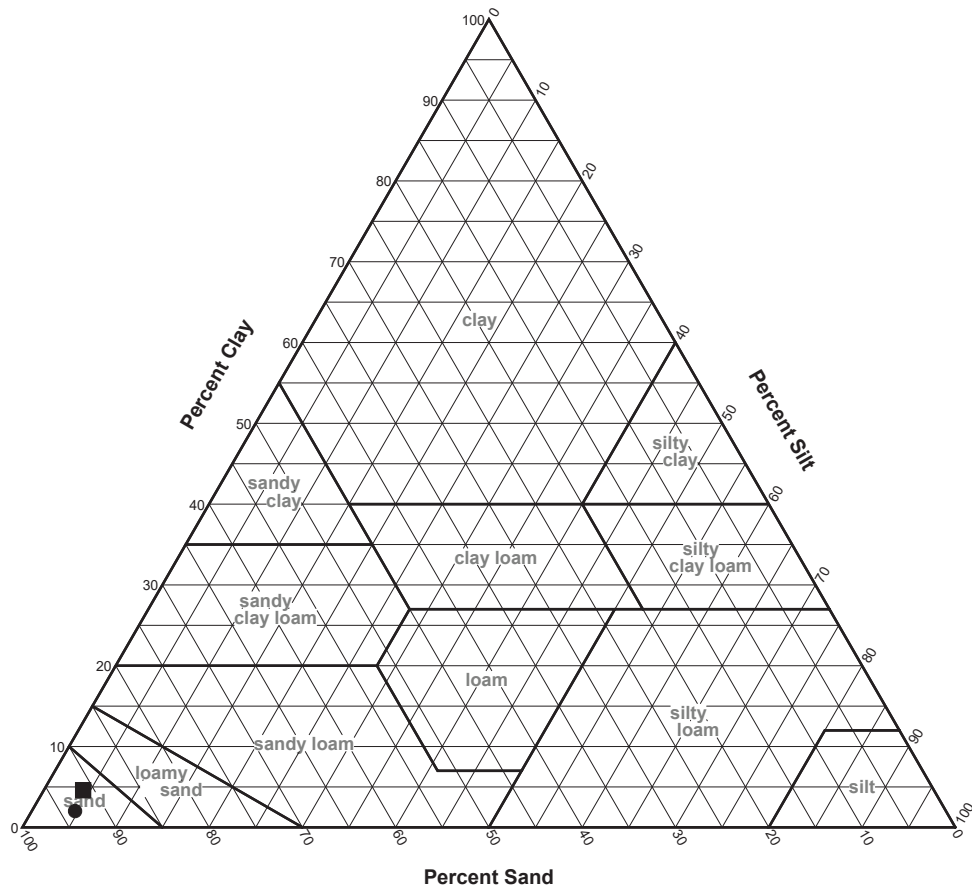
SPECIALIZED ENGINEERING

Frederick, Maryland

Remarks:

Figure

USDA Soil Classification



SOIL DATA							
	Source	Sample No.	Depth	Percentages From Material Passing a #10 Sieve			Classification
				Sand	Silt	Clay	
●		SWM-01, S-03	5.0'	93.3	4.7	1.9	Sand
■		SWM-02, S-05	11.0'	91.2	4.2	4.6	Sand

**SPECIALIZED
ENGINEERING**
Frederick, Maryland

Client: Frederick Ward Associates

Project: Bowie Ice Arena

Project No.: 218736

Figure

Programming

The consulting team of 292 Design Group performed a programming exercise on February 7th, 2022, with a group of design team members consisting of Bowie Ice Arena and Parks and Recreation staff. The goal of the programming exercise was to work with the group to determine the required spaces desired for the new ice arena. Direction was given that the goal was to keep the building program as close to the original Bowie Ice Arena as possible. The group adhered to that direction, except for a few minor exceptions, that are dictated more by ice sports participation and current code requirements. A few of the program upgrades are as follows:

- Additional storage
- 1 additional team room, 5 instead of 4. This helps with mixed sex teams and helps to have an overflow team room if games get behind schedule
- Added a coaches/skate coach room
- Created dedicated storage for hockey and figure skating
- Added an All-Gender restroom facility
- Two multipurpose rooms

The program document on the following pages is the outcome of the programming exercise. This document was used as the “road-map” to designing the concept floor plan.

Bowie Ice Arena					
Preliminary Program 7-Feb-22		LEED Silver Required For Project		Existing Bowie Ice Arena SF: 39,875	
Rinks and Associated Areas					
Arena	NHL size 85 x 200: SF includes dasher-boards. Sled hockey compatible				17,200
350 Seats	Aluminum Bleacher System				2,800
Deck area at Rink					4,500
Sub-Total					24,500
Mechanical/Electrical					
		Qty	Width	Length	
Resurfacer Room		1	x	x	1,100
Ice Mechanical Room		1	x	x	900
Shop/Tools	Part of Resurfacer Room	1	x	x	0
Technology Room	1 front of house and 1 back of house	2	10	10	200
Mechanical/Electrical		2	x	x	500
Storage	Need for building storage	1	x	x	400
Sub-Total					3,100
Locker Facilities					
		Qty	Width	Length	
Public Team Rooms (wet)	Access to shared toilet/shower	5	20	20	2,000
Team Room Toilet/Shower		2	10	16	320
Toilet/Shower		1	10	16	160
First Aid	Have been eliminating this space in many arenas	0	10	16	0
Coaches/Skate Coach		1	10	16	160
Referee Room	With dedicated toilet/shower	1	10	15	150
Referee Toilet/Shower	Nice to have - if budget allows	1	10	12	120
Skate Changing Area	Included in deck area/lobby	0	x	x	0
Hockey Storage		1	10	20	200
Sub-Total					3,110
Figure Skating					
Figure Skating Coaches		0	10	16	0
Figure Skating Locker Room	Changing stalls	0	12	20	0
Figure Skating Storage		1	10	18	180
Sub-Total					180
Support and Lease Space					
		Qty	Width	Length	
Skate Sharpening/Skate Rental		1	20	20	400
Lobby/Warming Area		1	x	x	2,500
Pro-Shop		1	x	x	800
Pro-Shop Storage		1	x	x	120
Multipurpose Rooms	Meeting/party rooms	2	20	28	1,120
Concessions		1	x	x	300
Concession Storage		1	x	x	300
Concessions Seating	In lobby square footage	0	x	x	0
Public Toilet Rooms	Based on 350 seats	2	12	21	504
All Gender Toilet	May need more?	1	8	8	64
Janitor		2	8	12	192
Dryland (Alternate)	3,600 SF Minimal size, shooting lanes/turf run/weights	0	30	120	0
Sub-Total					6,300
Administrative					
		Qty	Width	Length	
Manager's Office		1	10	18	180
Open Office	Reception/tickets/ work/copy/support: 2-3 staff/Floor Mounted Safe	1	12	18	216
Staff Toilets	All Gender	0	8	8	0
Storage		1	8	10	80
Staff Lockers		1	3	7	21
Sub-Total					497
Sub-Total					37,687
Net to Gross Factor					
Misc. Circulation/Walls	10 percent of total area				3,769
Total Square Footage					41,456

Concept Floor Plan & Building Section

Concept Floor Plan

The following concept floor plan was developed utilizing the program and with feedback from the City of Bowie design team members. The floor plan is organized in the following manner:

- The main entry includes a vestibule to help with indoor comfort and includes automatic sliding doors to allow for ease of entry with hockey bags.
- Once in the main lobby, the management and skate rental area are straight ahead. This allows for staff to easily see who is coming and going, and allows users to understand easily where to check-in.
- The management and skate rental area are connected to allow for the facility to operate with less staff during slower times. The management office also has a window directly into the rink to allow for visual supervision of the arena.
- The concessions area is located up front adjacent to the lobby to allow for easy access
- The lobby has views into the ice arena along with exterior windows to bring in natural light and create views to the gold course and wooded surroundings.
- The multipurpose rooms have a direct connection from the lobby with views to the ice arena. They are setup to allow for direct access the ice. This allows the rooms to hold meetings, birthday parties, team training sessions, figure skating workouts, etc.
- Public restrooms are sized according to occupancy load and are fully ADA compliant. The facility also includes an All-Gender restroom to allow for ADA use, ADA assist, and equity in restroom access.
- IT Rooms are located at the front and rear of the facility to allow for full building coverage for data and Wi-Fi coverage.
- Just down the hall from the lobby is a pro-shop. The pro-shop is located so it can large windows to the exterior.
- The team rooms are located just to the left inside the arena, with direct access to the player benches.
- Access to the bleachers is the right when you enter the arena, this layout allows the players and spectators to separate once they are in the arena, creating better flow through the facility. The bleachers are sized to accommodate 336 spectators, with 6 of the seats being ADA compliant.
- The ice-resurfacer room, refrigeration room, and mechanical/ electrical rooms are located to the rear of the facility. This type of layout minimizes spectators and players from crossing the ice-resurfacer access to the rink. This creates a safer environment for everyone.

Building Section

The building section is used to represent the type of construction and spaces developed for the ice arena.

The facility is proposed to be constructed of insulated precast wall panels because of their durability and excellent resistance to condensation. The roof system consists of long-span steel bar joists, perforated metal decking (to help with acoustics), R-38 of rigid insulation, and a fully adhered roof membrane.

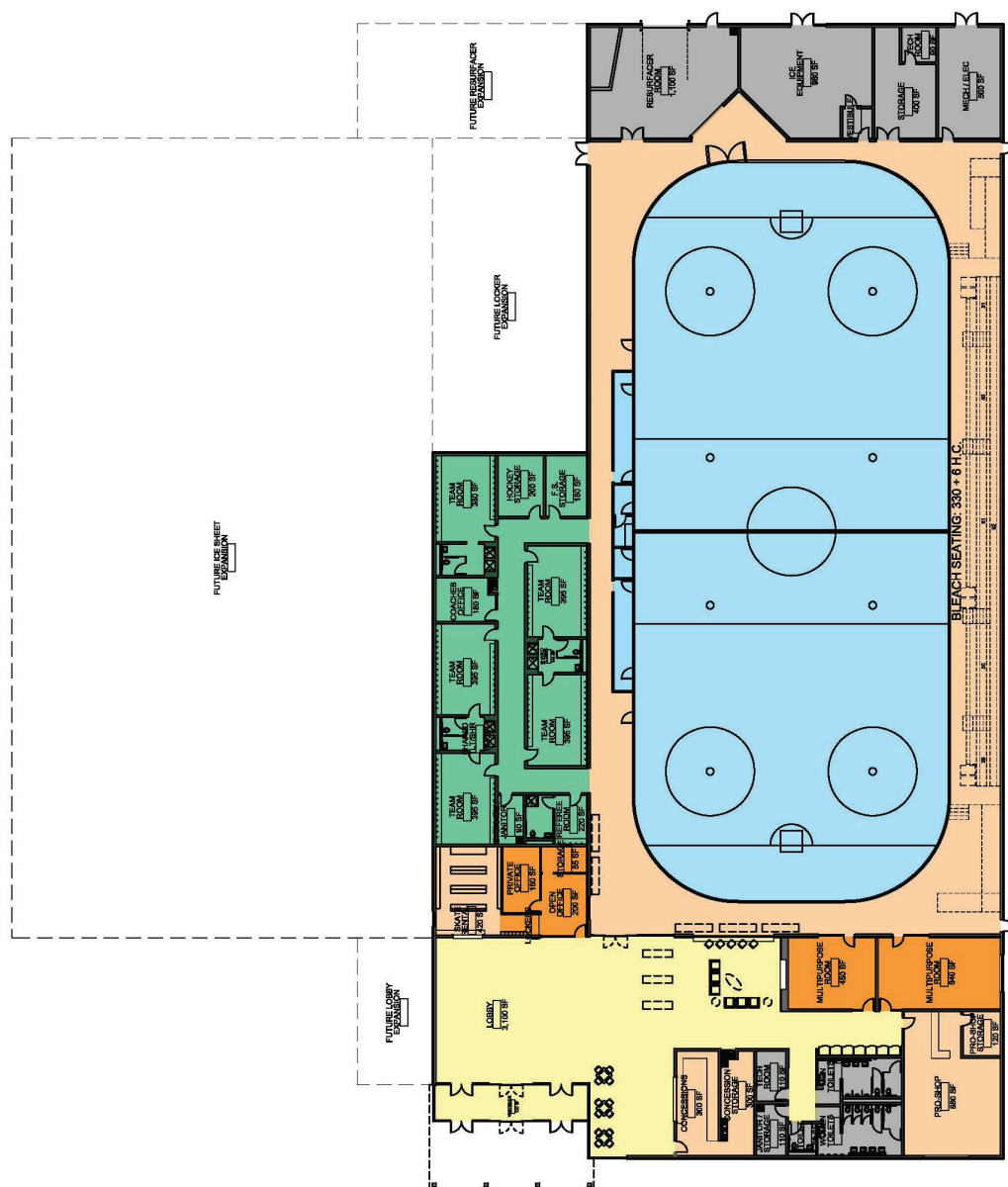
The refrigeration system will be industrial grade with heat recovery that will be used to provide sub-soil heating to prevent permafrost under the rink, to heat the ice-resurfacer water, and to also pre-heat domestic water. Dasher boards are state of the art steel framed system with tempered glass shielding.

Mechanical systems include desiccant dehumidification system and rooftop HVAC units with energy recovery.

Electrical lighting is 100% LED including the sport lighting over the rink.

The above construction system highlights are tried and true systems that will provide the City of Bowie with a state of the art well designed and constructed ice arena.

Per the City of Bowie requirements, LEED Silver Certification has been anticipated for the facility.





292Design
292DESIGN GROUP

BOWIE ICE ARENA
BUILDING SECTION

scale: NTS
03.17.22

Concept Site Plan

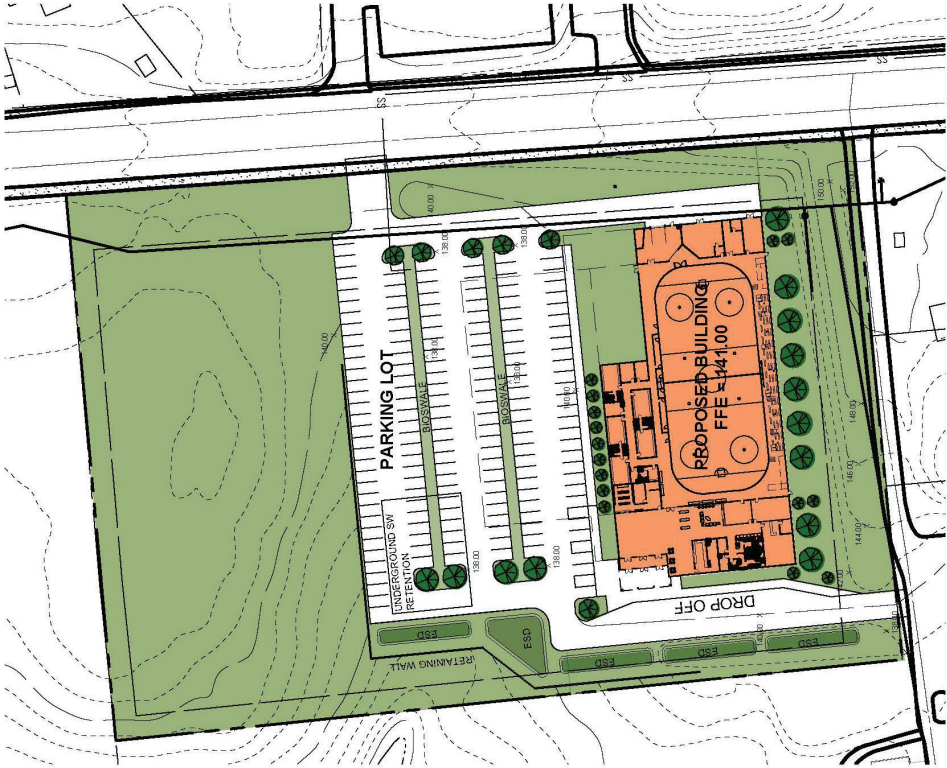
The following site plan was developed with input from the from the City of Bowie design team members and FWA consulting engineers. The building is located on the southern end of the site. This takes advantage of the natural grade the slopes toward the west and northerly edge of the site. Allowing for a cost-efficient storm water management design. The storm water management system consists of bio-swales between the parking aisles, underground storm water retention and ESD storm water bio-swales.

The main access to the ice arena facility is from the southwest of the site off Rockledge Drive. There is a drop-off lane in front of the ice arena, and then continues to the parking lot to the north. The parking lot can accommodate 156 parking stalls with 6 of them being handicap parking stalls.

Access to the ice arena is also proposed off Laurel Bowie Road, this will allow for a better flow of traffic for the large events and pickup and drop-off events.

The site has good access to Sanitary Sewer, Water, Gas, and Electric services. The building is located on the site to miss the existing 16" water main based on the site information currently available. If the project proceeds a topographic survey will be required to verify grades, utilities, and property boundaries.

The attached Traffic Generation Analysis performed by traffic consultant, Traffic Concepts, included herein concludes the trips generated have no significant impact of adjacent driveways or nearby road intersections which will continue to operate at Service Level A and have capacity to handle additional trips generated by this development. Refer to Traffic Generation Analysis section for further information.



SITE DATA

PROPERTY ADDRESS:	7704 LAUREL BOWIE ROAD BOWIE, MD 20715
OWNERS ADDRESS:	CITY OF BOWIE FRED RYDER ENTERPRISES INC 7420 LAUREL BOWIE RD BOWIE, MD 20715
TAX NUMBER:	14-1578863
TAX MAP:	37
PARCEL:	36
DEED REFERENCE:	5460/ 4
PROPERTY AREA:	±130.38 AC
AREA OF INTEREST:	±7.50 AC
ZONED:	OS - OPEN SPACE
WATER CATEGORY:	W-3 COMMUNITY SYSTEM
SEWER CATEGORY:	S-3 COMMUNITY SYSTEM
PROPOSED BUILDING:	31,107 SF

PARKING CALCULATION			
USE	REQUIRED PARKING	REQUIRED PARKING PER PLAN	PROVIDED PARKING
ATHLETIC USE	1 PARKING SPACE PER 4 SEATS (SPECTATOR SEATING)	400 BLEACHER SEATS / 4 SEATS = 100 REQUIRED PARKING SPACES	100 PROPOSED PARKING
OFFICE	1 PARKING SPACE FOR EVERY 250 SF OF GFA	800 SF / 250 GFA = 4 REQUIRED PARKING SPACES	4 PROPOSED PARKING
CONCESSIONS	1 SPACE FOR EVERY 50 SF OF GFA (NOT INCLUDING STORAGE)	300 SF / 50 GFA = 6 REQUIRED PARKING SPACES	6 PROPOSED PARKING
CONCESSIONS	1 SPACE FOR EVERY 3 SEATS	30 SEATS / 3 SEATS = 10 REQUIRED PARKING SPACES	46 PROPOSED PARKING
TOTAL CAR PARKING		120 REQUIRED PARKING SPACES	156 PROPOSED PARKING

* PER THE CITY OF BOWIE, PUBLIC PROJECTS ARE EXEMPT FROM THE LOCAL ZONING ORDINANCE. ANY REQUIREMENTS SHOWN OR NOTED HEREON ARE MERELY DESIGN GUIDANCE BASED ON THE PRINCE GEORGE'S COUNTY ZONING CODE FOR DETERMINING A REASONABLE AMOUNT OF PARKING, BUILDING SETBACKS, OR OTHER DESIGN PARAMETERS. OTHER STATE OR FEDERAL CRITERIA STILL APPLY.



292Desig
292DESIGNGROUP

BOWIE ICE ARENA
CONCEPT SITE PLAN

scale: 1"=50'
03/17/2021

Traffic Study

TRAFFIC CONCEPTS, INC.

Traffic Impact Studies • Feasibility • Traffic Signal Design • Traffic Counts • Expert Testimony

March 17, 2022

Bruce T. Beasman, P.E.
Project Manager
Frederick Ward Associates
5 South Main Street; PO Box 727
Bel Air, Maryland 21014-0727

RE: Traffic Impact Study
City of Bowie
Ice Arena - MD 197
T/C 3543

Traffic Concepts, Inc. conducted a trip generation analysis and an intersection level of service analysis for a proposed ice arena with a single rink that will be located at 7420 MD 197 (Laurel Bowie Road) Bowie, Maryland. The building site is located on the Bowie Golf Club property and the site is situated on the northwest quadrant of MD 197 (Laurel Bowie Road) and the access road to the Bowie Golf Club. The location of the proposed area is shown on Exhibit 1.

Proposed Description

The proposed ice area will be constructed with 350 seats. However, approximately 20 times per year the arena could host sports games and or tournaments where a maximum capacity of 500 people could occupy the area.

Site Access

The arena parking lot is proposed with one full-movement access directly to MD 197 and one direct full-movement access to the Bowie Golf Club access road.

Scope of Services & Study Methodology

The scope of this study includes the site access intersection and the nearest public road intersection, as listed on the following page. The intersection turning movement counts are provided as an attachment. In order to create a worst-case traffic scenario all new site trips were assigned to the Bowie Golf Club access road.

Key Intersections

Control

- MD 197 (Laurel Bowie Road) @ Rockledge Drive (Unsignalized)
- MD 197 (Laurel Bowie Road) @ Bowie Golf Club access road (Unsignalized)

Study Time Periods & Analysis Methodology

The key intersections were analyzed during the weekday morning (7:00 AM - 9:00 AM) and evening (4:00 PM – 6:00 PM) peak hours using the following methods:

All intersections: Critical Lane Volume Method
 Highway Capacity Manual Method

Study Format

The study was conducted to include an existing and future traffic condition analysis. The future site generated trips were determined with data contained in the Institute of Transportation Engineers', Trip Generation Manual, 11th Edition (ITE).

Existing Condition

The existing traffic condition establishes the baseline intersection levels of service at the key intersections. The intersection turning movement counts were conducted March 8, 2022 under normal traffic conditions and when public schools were open.

The intersection lane configurations are shown on Exhibit 2 and the peak hour intersection turning movement volumes are shown on Exhibit 3.

Future Condition

The new site generated peak hour trips shown below were generated using the Institute of Transportation Engineers' (ITE), Trip Generation Manual, 11th Edition. The new site trips are shown on Exhibit 4. The ITE trip generation report is included as a study attachment.

	AM		PM	
	<u>IN</u>	<u>OUT</u>	<u>IN</u>	<u>OUT</u>
Ice Skating Rink (ITE 465) 500 Capacity	0	0	24	16

The trip distribution pattern, shown on Exhibit 4, was determined with the existing traffic flows observed along MD 197. The total future traffic volumes are obtained by adding the new site trips to the existing traffic volumes, as shown on Exhibit 5.

ITE DATA STATISTICS

Land Use: Ice Skating Rink (465)

Independent Variable: Seats

Time Period: Weekday (PM Peak Hour of Generator)

Average Rate: 0.08

Fitted Curve Equation: Not Given

Directional Distribution: 60% entering, 40% exiting

Calculated Trip Ends: Average Rate: 40 (Total), 24 (Entry), 16 (Exit)

Intersection Capacity Analysis

The key intersections were analyzed during the existing and future traffic conditions. The intersection capacity results are listed on the following tables and the detailed calculations are included as an attachment.

CRITICAL LANE VOLUME ANALYSIS – AM PEAK HOUR			
KEY INTERSECTIONS	EXISTING CLV / LOS		FUTURE CLV / LOS
MD 197 @ Bowie Golf Club Access Road	478 / A		--
MD 197 @ Rockledge Drive	937 / A		578 / A
CRITICAL LANE VOLUME ANALYSIS – PM PEAK HOUR			
KEY INTERSECTIONS	EXISTING CLV / LOS		FUTURE CLV / LOS
MD 197 @ Bowie Golf Club Access Road	533 / A		--
MD 197 @ Rockledge Drive	546 / A		549 / A

HIGHWAY CAPACITY MANUAL: STOP CONTROL - AM PEAK HOUR			
KEY INTERSECTIONS	EXISTING Delay / LOS		FUTURE Delay / LOS
MD 197 @ Bowie Golf Club Access Road			
EB – Left/Thru	10.5 / B		--
NB – Left/Right	9.1 / A		--
MD 197 @ Rockledge Drive			
WB – Left	21.8 / C		--
Right	12.4 / B		--
SB – Left	10.2 / B		--
HIGHWAY CAPACITY MANUAL: STOP CONTROL - PM PEAK HOUR			
KEY INTERSECTIONS	EXISTING Delay / LOS		FUTURE Delay / LOS
MD 197 @ Bowie Golf Club Access Road			
EB – Left/Thru	17.2 / C		18.0 / C
NB – Left/Right	10.2 / B		10.4 / B
MD 197 @ Rockledge Drive			
WB – Left	17.7 / C		17.8 / C
Right	10.7 / B		10.8 / B
SB – Left	9.1 / A		9.2 / A

CONCLUSIONS AND RECOMMENDATIONS

The weekday peak hour trip generation analysis determined the proposed ice arena with a single rink would generate no weekday AM peak hour trips and 40 PM peak hour trips. According to the MDOT State Highway Administration's *Traffic Impact Study Guidelines*, this project would not meet the weekday peak hour trip threshold of 50 trips. Therefore, the developer would not be required to submit a full traffic impact study.

The proposed ice arena is would be with one full-movement access directly onto MD 197 and one full-movement access directly onto the Bowie Golf Club access road. As stated, this access study was conducted to represent a worst-case traffic scenario by assigning all new peak hour trips to the existing Bowie Golf Club access road.

The Critical Lane Volume and the Highway Capacity Manual results shows that the site access intersection and the nearby MD 197 @ Rockledge Road intersection would continue to operate at acceptable "C" or better overall levels of service upon the build-out of the proposed ice arena project.

Based on the study results, we recommend approval of this project from a traffic impact standpoint.

Bruce T. Beasman, P.E.
March 17, 2022
Page 5 of 5

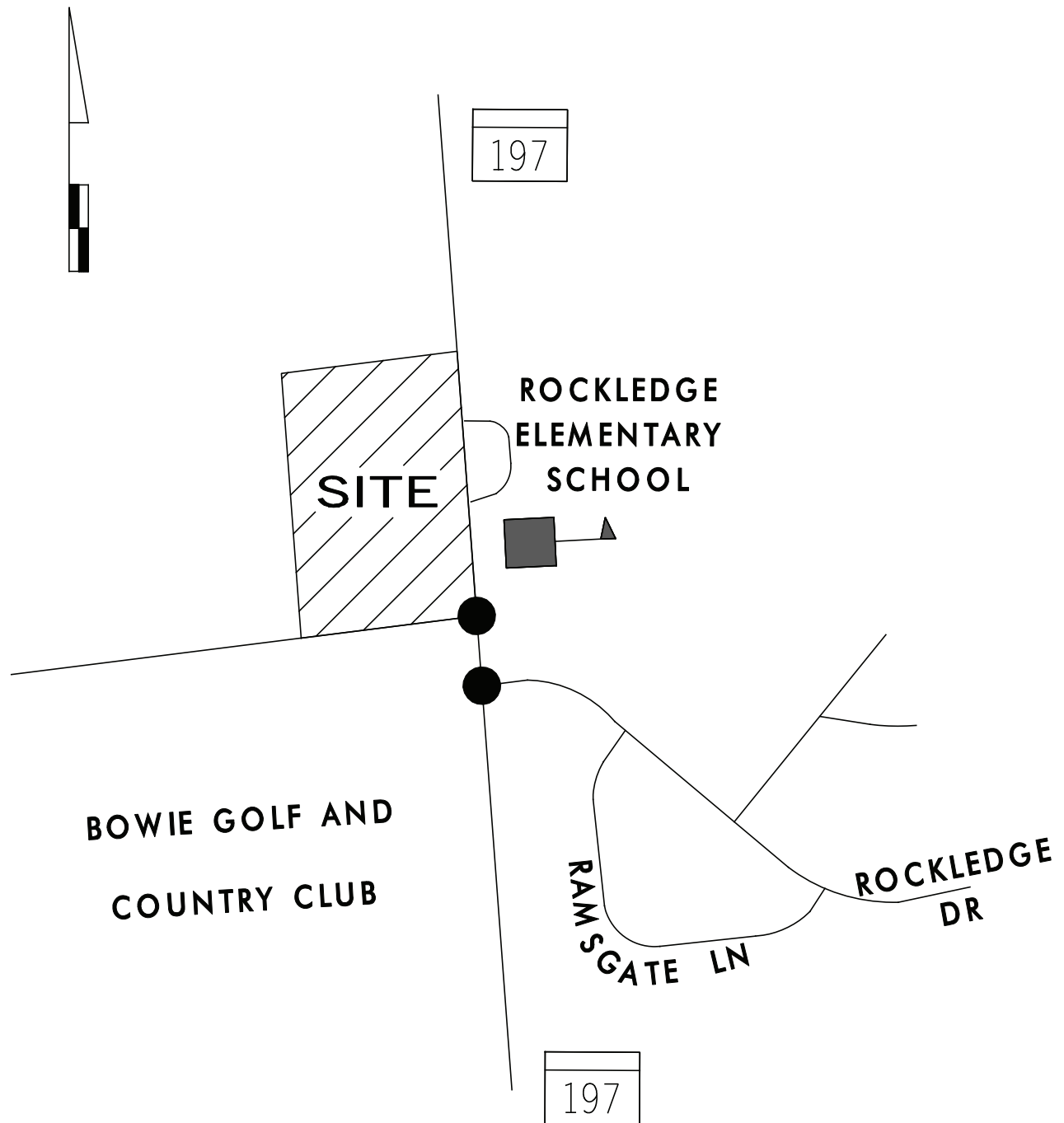
If you have any questions concerning this study, please do not hesitate to contact our office.

Sincerely,

TRAFFIC CONCEPTS, INC.

A handwritten signature in black ink that reads "J. Mark Keeley". The signature is written in a cursive style with a large, stylized "J" and "K".

Mark Keeley, PTP
Project Manager
MKeeley@traffic-concepts.com

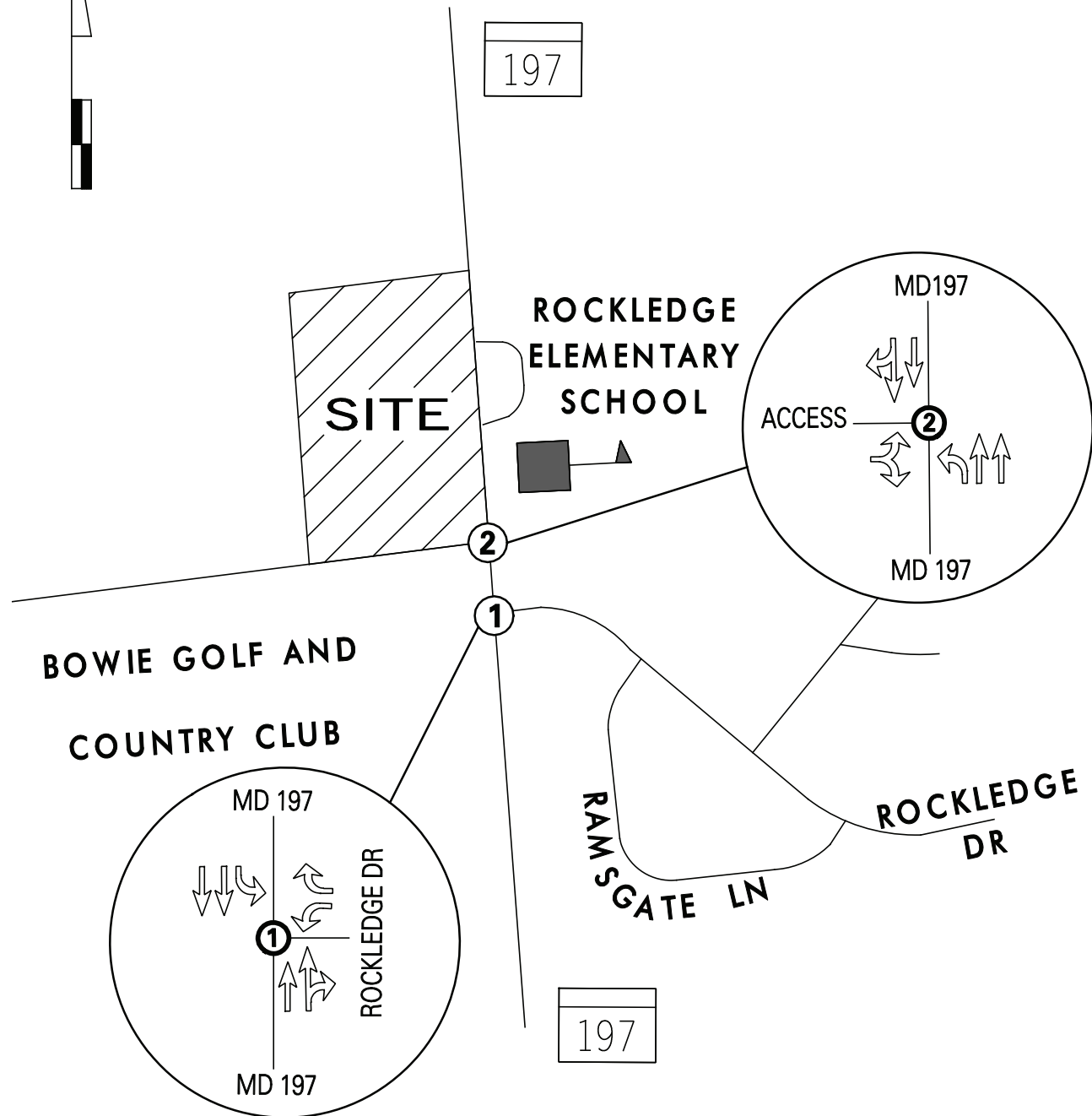


NOT TO SCALE

● — Intersection Studied

TRAFFIC CONCEPTS, INC.
7525 Connelley Drive
Suite B
Hanover, Maryland 21076
410-760-2911

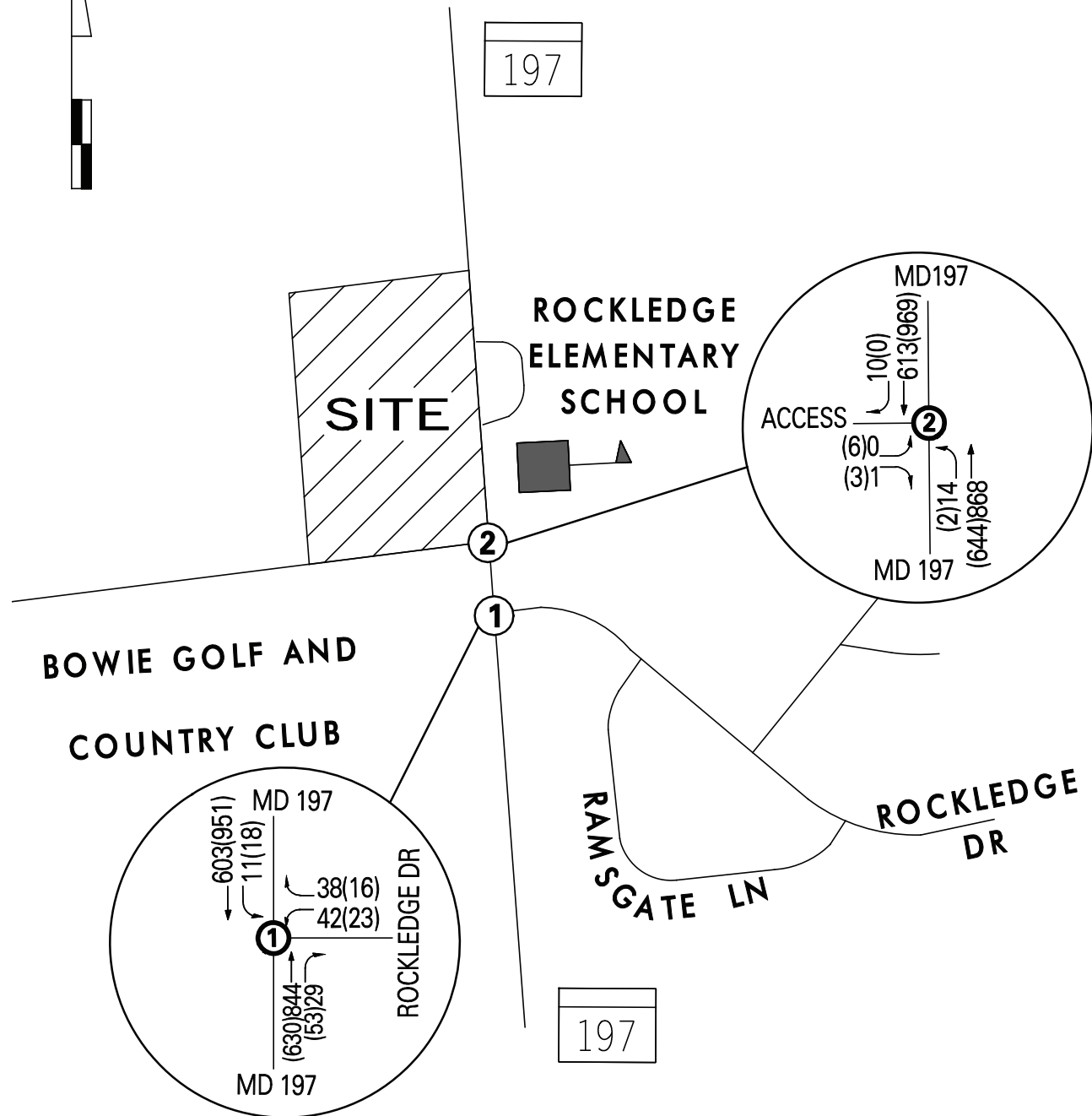
EXHIBIT 1
Site Location Map



NOT TO SCALE

TRAFFIC CONCEPTS, INC.
7525 Connelley Drive
Suite B
Hanover, Maryland 21076
410-760-2911

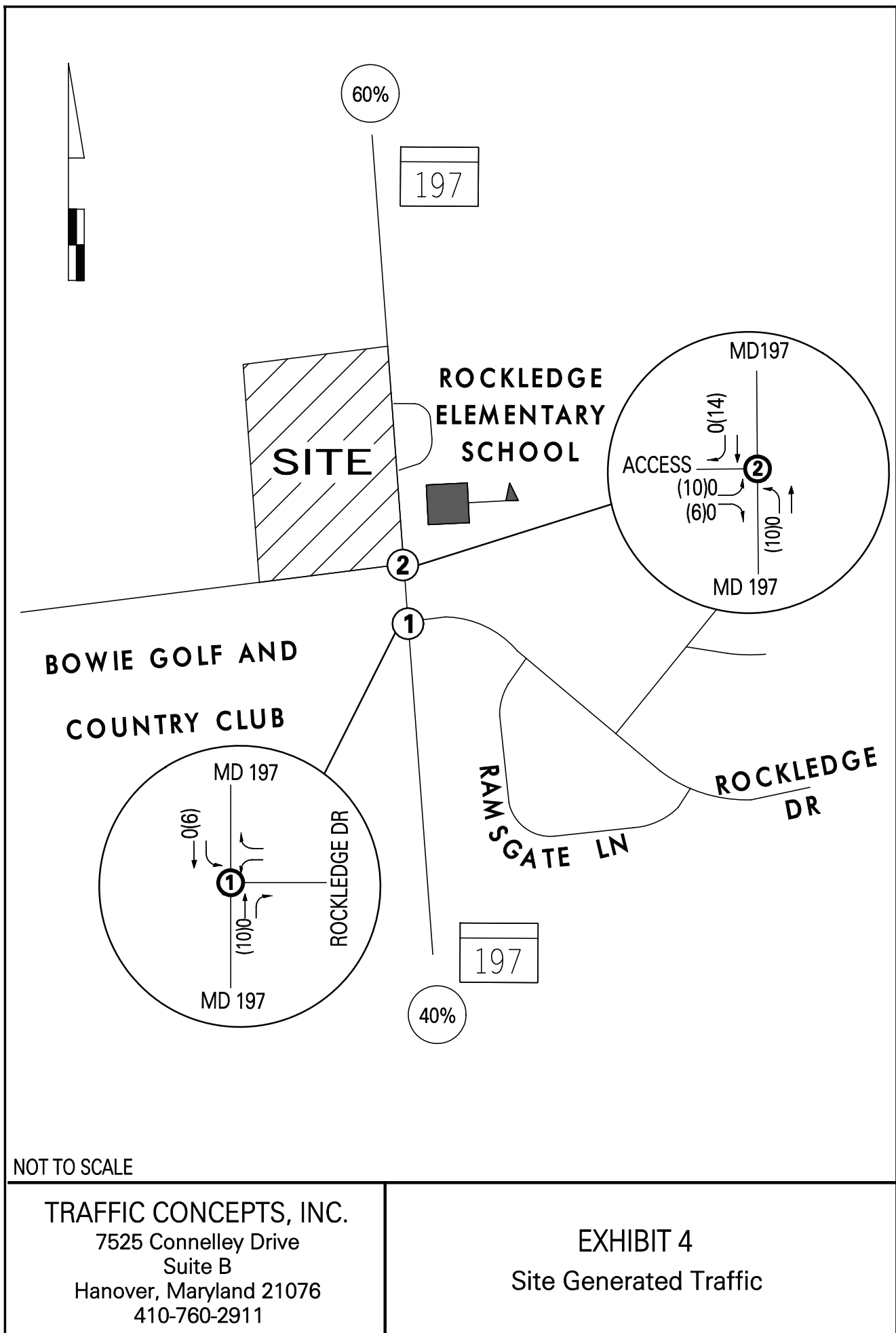
EXHIBIT 2
Lane Configuration

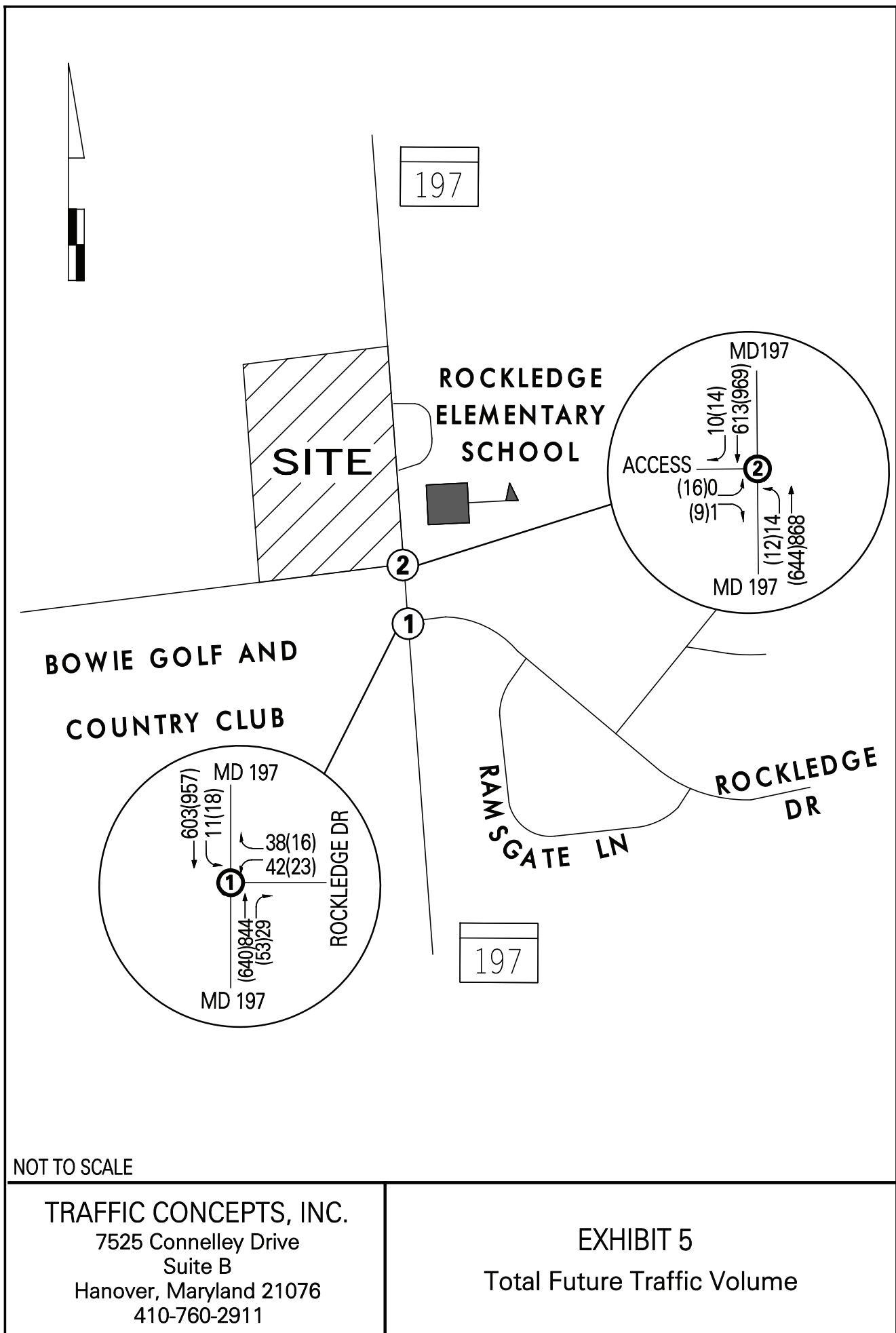


NOT TO SCALE

TRAFFIC CONCEPTS, INC.
7525 Connelley Drive
Suite B
Hanover, Maryland 21076
410-760-2911

EXHIBIT 3
Existing Traffic Volumes





Ice Skating Rink (465)

Vehicle Trip Ends vs: Seats
On a: Weekday,
PM Peak Hour of Generator

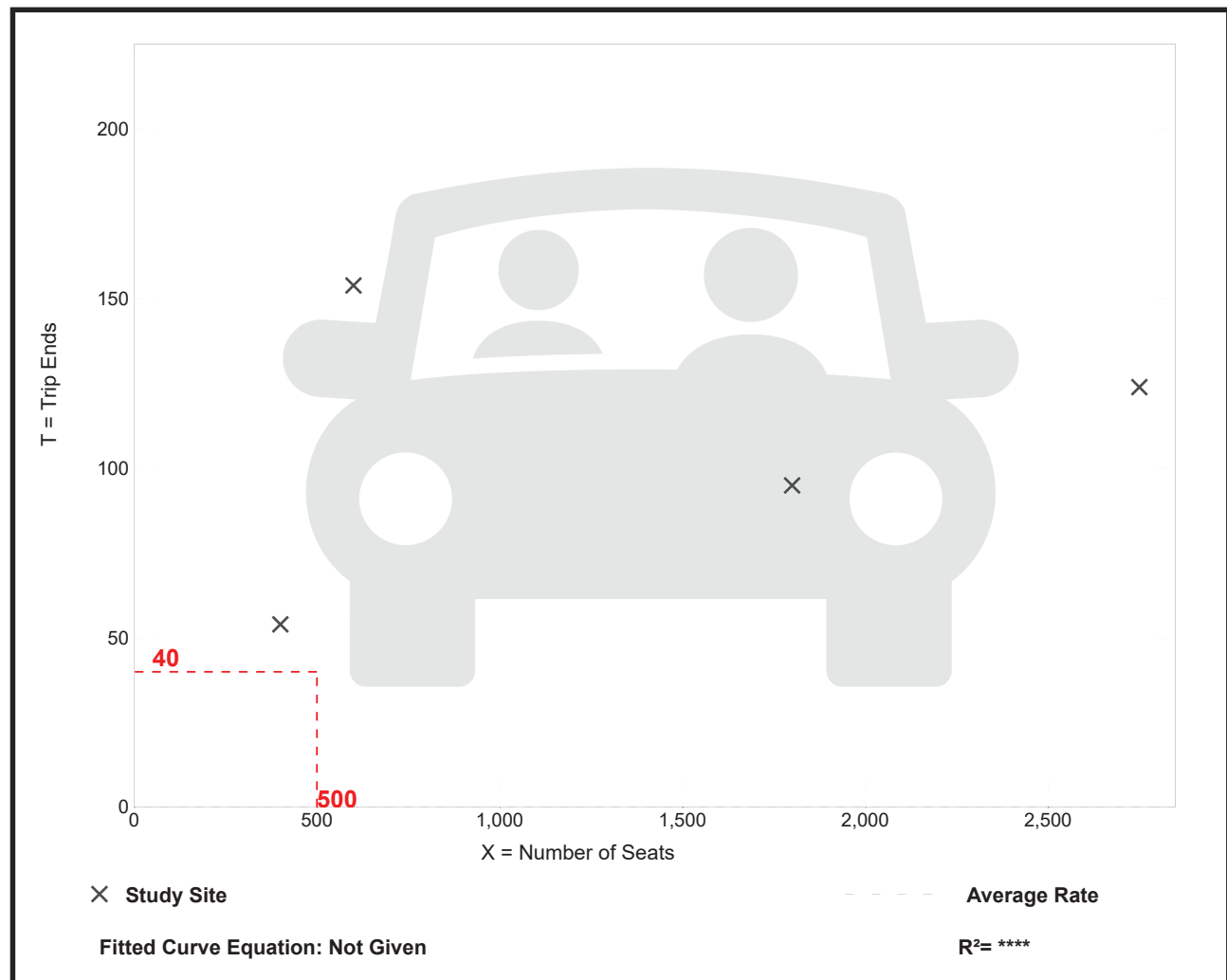
Setting/Location: General Urban/Suburban
 Number of Studies: 4
 Avg. Num. of Seats: 1388
 Directional Distribution: 60% entering, 40% exiting

Vehicle Trip Generation per Seat

Average Rate	Range of Rates	Standard Deviation
0.08	0.05 - 0.26	0.08

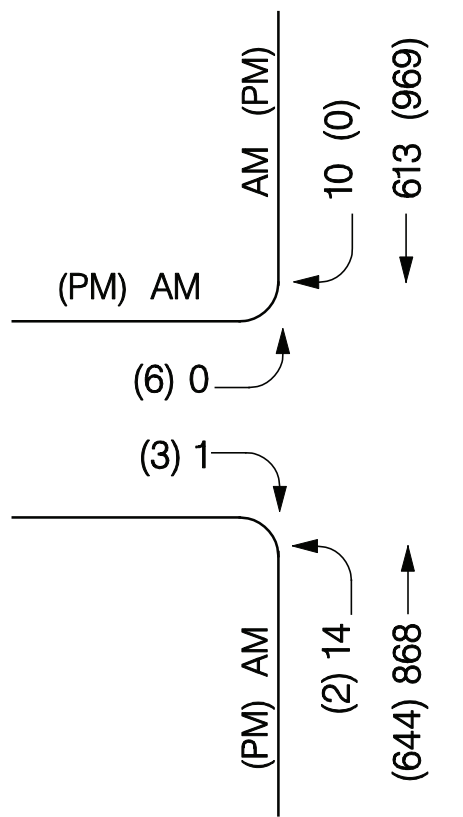
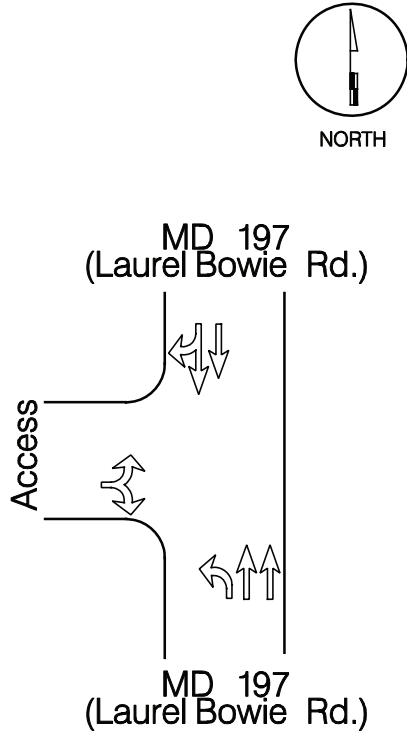
Data Plot and Equation

Caution – Small Sample Size





LANE CONFIGURATION



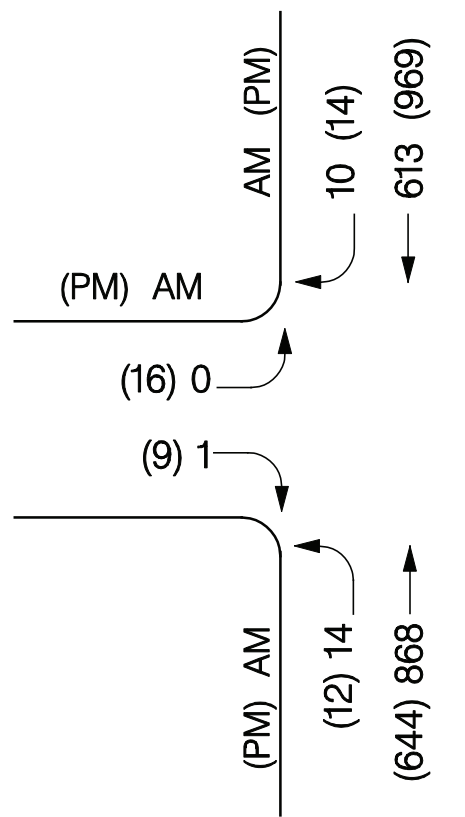
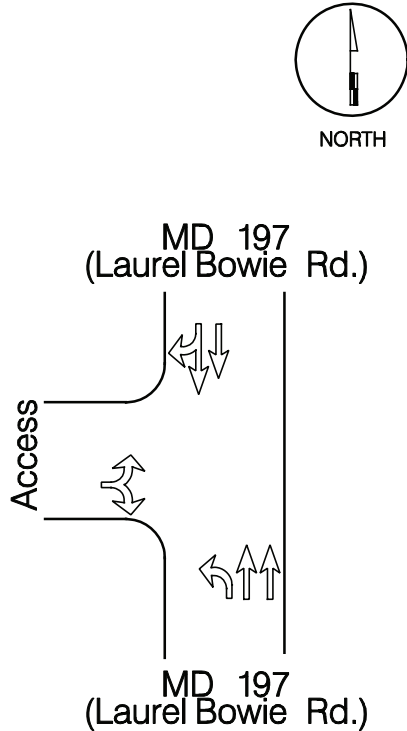
		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =				CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	868	*	0.55	=	477*	
	SB	(613 + 10)	*	0.55	+ 14 * 1 =	357	
	EB	(1 + 0)	*	1	=	1*	A 478
	WB	—				—	
PM	NB	644	*	0.55	=	354	
	SB	(969 + 0)	*	0.55	+ 2 * 1 =	535*	
	EB	(3 + 6)	*	1	=	9*	A 544
	WB	—				—	

CRITICAL LANE ANALYSIS

Prepared By: B. SCHMID Condition: EXISTING



LANE CONFIGURATION

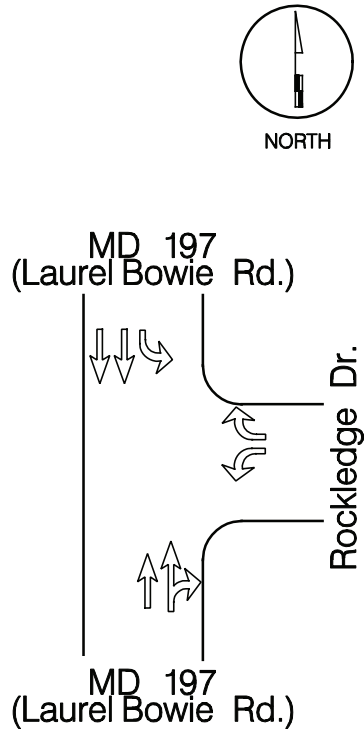


		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =				CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	868	*	0.55	=	477*	
	SB	(613 + 10)	*	0.55	+ 14 * 1 =	357	
	EB	(1 + 0)	*	1	=	1*	A 478
	WB	—				—	
PM	NB	644	*	0.55	=	354	
	SB	(969 + 14)	*	0.55	+ 12 * 1 =	553*	
	EB	(9 + 16)	*	1	=	25*	A 578
	WB	—				—	

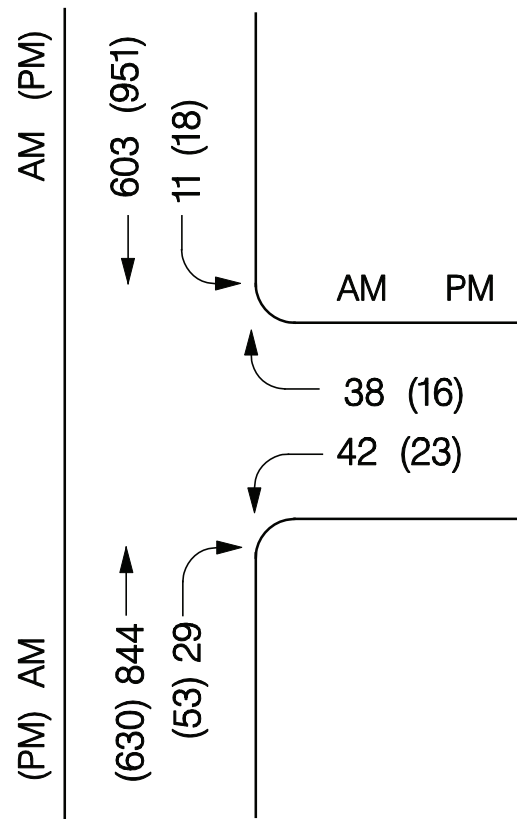
CRITICAL LANE ANALYSIS

Prepared By: B. SCHMID Condition: FUTURE

LANE CONFIGURATION



TRAFFIC VOLUMES

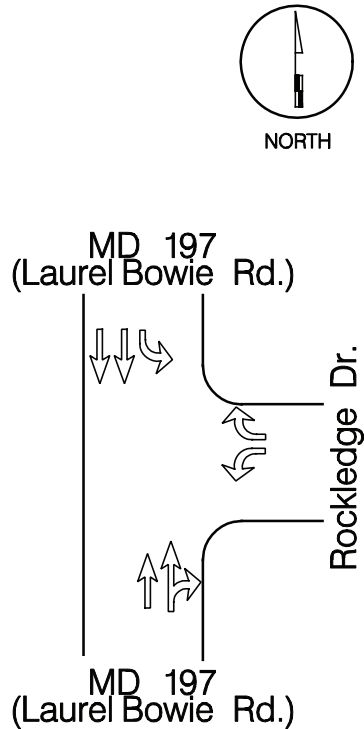


		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =							CRITICAL LANE VOLUME	LEVEL OF SERVICE	
AM	NB	(844 + 29)	*	0.55	+	11	*	1	=	491*	
	SB	603	*	0.55					=	332	
	EB	—							—	A 533	
	WB	42	*	1				=	42*		
PM	NB	(630 + 53)	*	0.55	+	18	*	1	=	394	
	SB	951	*	0.55					=	523*	
	EB	—							—	A 546	
	WB	23	*	1				=	23*		

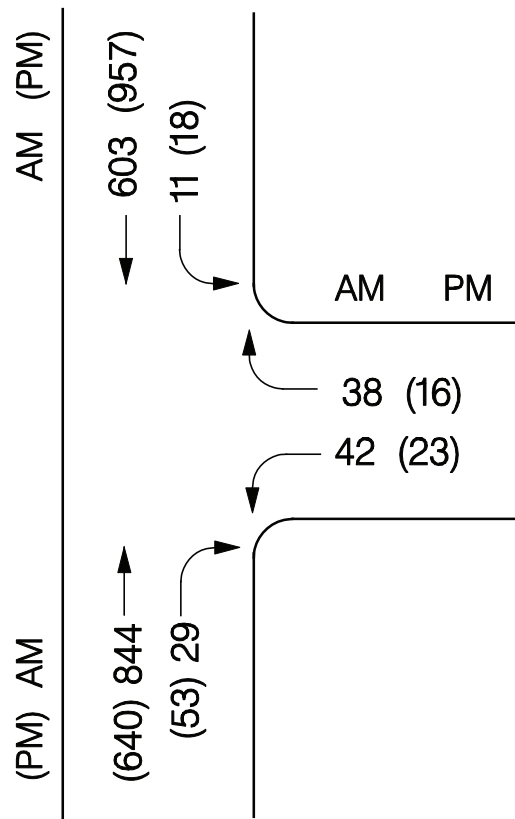
CRITICAL LANE ANALYSIS

Prepared By: B. SCHMID Condition: EXISTING

LANE CONFIGURATION



TRAFFIC VOLUMES



		TOTAL VOLUME * LUF + OPPOSING LEFTS * LUF =				CRITICAL LANE VOLUME	LEVEL OF SERVICE
AM	NB	(844 + 29) * 0.55	+	11 * 1	=	491*	
	SB	603 * 0.55			=	332	
	EB	—				—	A 533
	WB	42 * 1			=	42*	
PM	NB	(640 + 53) * 0.55	+	18 * 1	=	399	
	SB	957 * 0.55			=	526*	
	EB	—				—	A 549
	WB	23 * 1			=	23*	

CRITICAL LANE ANALYSIS

Prepared By: B. SCHMID Condition: FUTURE

HCS7 Two-Way Stop-Control Report

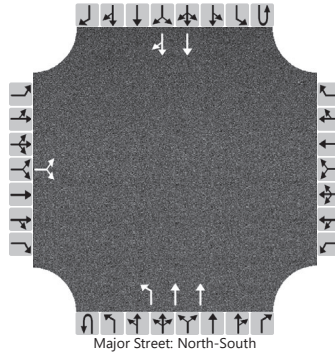
General Information

Analyst	B. Schmid
Agency/Co.	Traffic Concepts, Inc.
Date Performed	3/16/2022
Analysis Year	2022
Time Analyzed	Existing AM
Intersection Orientation	North-South
Project Description	3543

Site Information

Intersection	MD 197 at Access
Jurisdiction	City of Bowie
East/West Street	Access
North/South Street	MD 197
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	1	2	0	0	0	2	0
Configuration			LR							L	T				T	TR
Volume (veh/h)		0		1					0	14	868				613	10
Percent Heavy Vehicles (%)		2		2					2	2						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9						4.1						
Critical Headway (sec)		6.84		6.94						4.14						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			1							16						
Capacity, c (veh/h)			650							899						
v/c Ratio			0.00							0.02						
95% Queue Length, Q ₉₅ (veh)			0.0							0.1						
Control Delay (s/veh)			10.5							9.1						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	10.5								0.1							
Approach LOS	B															

HCS7 Two-Way Stop-Control Report

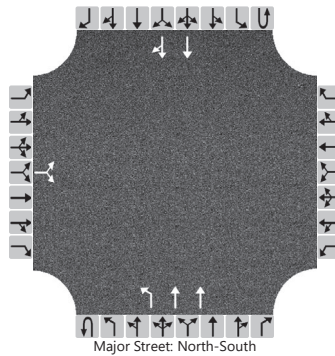
General Information

Analyst	B. Schmid
Agency/Co.	Traffic Concepts, Inc.
Date Performed	3/16/2022
Analysis Year	2022
Time Analyzed	Existing PM
Intersection Orientation	North-South
Project Description	3543

Site Information

Intersection	MD 197 at Access
Jurisdiction	City of Bowie
East/West Street	Access
North/South Street	MD 197
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	1	2	0	0	0	2	0
Configuration			LR							L	T				T	TR
Volume (veh/h)		6		3					0	2	644				969	0
Percent Heavy Vehicles (%)		2		2					2	2						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9						4.1						
Critical Headway (sec)		6.84		6.94						4.14						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			9							2						
Capacity, c (veh/h)			304							689						
v/c Ratio			0.03							0.00						
95% Queue Length, Q ₉₅ (veh)			0.1							0.0						
Control Delay (s/veh)			17.2							10.2						
Level of Service (LOS)			C							B						
Approach Delay (s/veh)	17.2								0.0							
Approach LOS	C															

HCS7 Two-Way Stop-Control Report

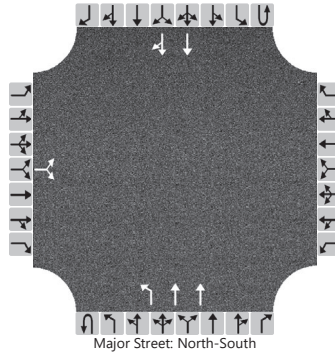
General Information

Analyst	B. Schmid
Agency/Co.	Traffic Concepts, Inc.
Date Performed	3/16/2022
Analysis Year	2022
Time Analyzed	Future PM
Intersection Orientation	North-South
Project Description	3543

Site Information

Intersection	MD 197 at Access
Jurisdiction	City of Bowie
East/West Street	Access
North/South Street	MD 197
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	1	2	0	0	0	2	0
Configuration			LR							L	T				T	TR
Volume (veh/h)		16		9					0	12	644				969	14
Percent Heavy Vehicles (%)		2		2					2	2						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9						4.1						
Critical Headway (sec)		6.84		6.94						4.14						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			26							12						
Capacity, c (veh/h)			303							680						
v/c Ratio			0.09							0.02						
95% Queue Length, Q ₉₅ (veh)			0.3							0.1						
Control Delay (s/veh)			18.0							10.4						
Level of Service (LOS)			C							B						
Approach Delay (s/veh)	18.0								0.2							
Approach LOS	C															

HCS7 Two-Way Stop-Control Report

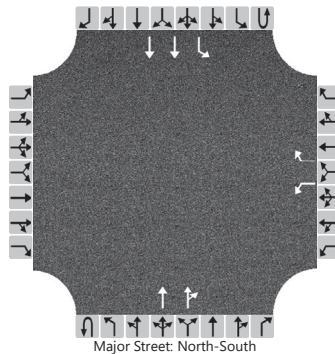
General Information

Analyst	B. Schmid
Agency/Co.	Traffic Concepts, Inc.
Date Performed	3/16/2022
Analysis Year	2022
Time Analyzed	Existing AM
Intersection Orientation	North-South
Project Description	3543

Site Information

Intersection	MD 197 at Rockledge Drive
Jurisdiction	City of Bowie
East/West Street	Rockledge Drive
North/South Street	MD 197
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	2	0	0	1	2	0
Configuration						L		R			T	TR		L	T	
Volume (veh/h)						42		38			844	29	0	11	603	
Percent Heavy Vehicles (%)						2		2					2	2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					No											
Median Type Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)						7.5		6.9						4.1		
Critical Headway (sec)						6.84		6.94						4.14		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						47		42						12		
Capacity, c (veh/h)						260		528						706		
v/c Ratio						0.18		0.08						0.02		
95% Queue Length, Q ₉₅ (veh)						0.6		0.3						0.1		
Control Delay (s/veh)						21.8		12.4						10.2		
Level of Service (LOS)						C		B						B		
Approach Delay (s/veh)					17.4								0.2			
Approach LOS					C											

HCS7 Two-Way Stop-Control Report

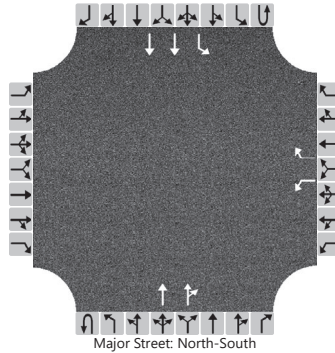
General Information

Analyst	B. Schmid
Agency/Co.	Traffic Concepts, Inc.
Date Performed	3/16/2022
Analysis Year	2022
Time Analyzed	Existing PM
Intersection Orientation	North-South
Project Description	3543

Site Information

Intersection	MD 197 at Rockledge Drive
Jurisdiction	City of Bowie
East/West Street	Rockledge Drive
North/South Street	MD 197
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	2	0	0	1	2	0
Configuration						L		R			T	TR		L	T	
Volume (veh/h)						23		16			630	53	0	18	951	
Percent Heavy Vehicles (%)						2		2					2	2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					No											
Median Type Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)						7.5		6.9						4.1		
Critical Headway (sec)						6.84		6.94						4.14		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						24		16						19		
Capacity, c (veh/h)						308		644						890		
v/c Ratio						0.08		0.03						0.02		
95% Queue Length, Q ₉₅ (veh)						0.2		0.1						0.1		
Control Delay (s/veh)						17.7		10.7						9.1		
Level of Service (LOS)						C		B						A		
Approach Delay (s/veh)					14.8								0.2			
Approach LOS					B											

HCS7 Two-Way Stop-Control Report

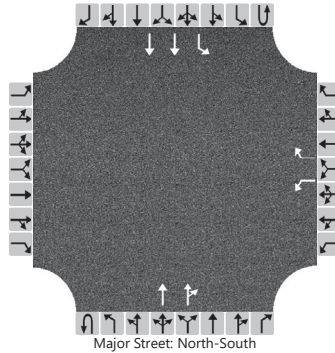
General Information

Analyst	B. Schmid
Agency/Co.	Traffic Concepts, Inc.
Date Performed	3/16/2022
Analysis Year	2022
Time Analyzed	Future PM
Intersection Orientation	North-South
Project Description	3543

Site Information

Intersection	MD 197 at Rockledge Drive
Jurisdiction	City of Bowie
East/West Street	Rockledge Drive
North/South Street	MD 197
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	2	0	0	1	2	0
Configuration						L		R			T	TR		L	T	
Volume (veh/h)						23		16			640	53	0	18	957	
Percent Heavy Vehicles (%)						2		2					2	2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					No											
Median Type Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)						7.5		6.9						4.1		
Critical Headway (sec)						6.84		6.94						4.14		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						24		16						19		
Capacity, c (veh/h)						304		639						882		
v/c Ratio						0.08		0.03						0.02		
95% Queue Length, Q ₉₅ (veh)						0.3		0.1						0.1		
Control Delay (s/veh)						17.8		10.8						9.2		
Level of Service (LOS)						C		B						A		
Approach Delay (s/veh)					14.9								0.2			
Approach LOS					B											

PEAK HOUR TURNING MOVEMENT COUNT

INTERSECTION: MD 197 @ ROCKLEDGE DR

JURISDICTION: CITY OF BOWIE

COUNT BY: CAMERA

DATE: MARCH 8, 2022

WEATHER: CLEAR

DAY: TUESDAY

TIME	MD 197 NORTHBOUND			MD 197 SOUTHBOUND			EASTBOUND			ROCKLEDGE DR WESTBOUND			TOTAL
	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
AM													
7:00-7:15		186	0	2	85					6		7	286
7:15-7:30		177	3	1	141					10		4	336
7:30-7:45		201	5	4	125					8		8	351
7:45-8:00		238	7	2	149					13		12	421
8:00-8:15		228	14	4	188					11		14	459
8:15-8:30		156	4	2	129					8		5	304
8:30-8:45		138	4	2	138					8		4	294
8:45-9:00		154	4	2	141					6		3	310
PEAK HR 7:15-8:15 TOTALS		844	29	11	603					42		38	PHF 0.85
PM													
4:00-4:15		128	10	2	196					8		1	345
4:15-4:30		133	14	4	217					4		2	374
4:30-4:45		132	7	6	226					7		1	379
4:45-5:00		175	11	4	230					6		4	430
5:00-5:15		137	19	1	237					5		8	407
5:15-5:30		153	13	5	240					5		2	418
5:30-5:45		165	10	8	244					7		2	436
5:45-6:00		156	9	6	209					9		7	396
PEAK HR 4:45-5:45 TOTALS		630	53	18	951					23		16	PHF 0.97

TRAFFIC CONCEPTS, INC.
 7525 CONNELLEY DRIVE, SUITE B
 HANOVER, MARYLAND 21076
 410-760-2911 FAX 410-760-2915
 E-MAIL TRAFFIC@TRAFFIC-CONCEPTS.COM

M:\3543

PEAK HOUR TURNING MOVEMENT COUNT

INTERSECTION: MD 197 @ GOLF CLUB ACCESS

COUNTY: ANNE ARUNDEL

COUNT BY: CAMERA (B.SMITH)

DATE: MARCH 8, 2022

WEATHER: OVERCAST / CLEAR

DAY: TUESDAY

CAM													
TIME	MD 197 NORTHBOUND			MD 197 SOUTHBOUND			GOLF CLUB EASTBOUND			WESTBOUND			TOTAL
	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
AM													
7:00-7:15	0	193			87	0	0		0				280
7:15-7:30	1	180			142	3	0		0				326
7:30-7:45	4	205			128	0	0		1				338
7:45-8:00	3	247			151	1	0		0				402
8:00-8:15	6	236			192	6	0		0				440
8:15-8:30	3	158			131	2	0		0				294
8:30-8:45	0	142			140	1	0		0				283
8:45-9:00	0	157			143	0	0		0				300
PEAK HR 7:15-8:15 TOTALS	14	868			613	10	0		1				PHF 0.86
PM													
4:00-4:15	3	126			198	0	0		4				331
4:15-4:30	1	134			221	0	1		9				366
4:30-4:45	0	133			232	1	1		3				370
4:45-5:00	0	179			234	0	4		1				418
5:00-5:15	0	145			238	0	0		0				383
5:15-5:30	2	153			245	0	2		1				403
5:30-5:45	0	167			252	0	0		1				420
5:45-6:00	0	163			215	0	0		4				382
PEAK HR 4:45-5:45 TOTALS	2	644			969	0	6		3				PHF 0.97

TRAFFIC CONCEPTS, INC.
 7525 CONNELLEY DRIVE, SUITE B
 HANOVER, MARYLAND 21076
 410 760 2911 (FAX) 410 760 2915
 E-MAIL TRAFFIC@TRAFFIC-CONCEPTS.COM

M:\3543

Cost Estimate

The following cost estimate was provided by RJM Construction a construction firm that specializes in ice arena construction. 292 Design Group worked with RJM Construction to establish the quality and scope of the ice arena project. The following budget includes both construction costs and owner costs (soft costs) to develop an overall project budget. It also includes contingencies and an escalation factor given today's supply chain and inflation pressures on the construction market.



March 15, 2022

Tom Betti
Partner
292 Design Group
3533 E Lake Street
Minneapolis, MN 55406

Re: Bowie Ice Arena

Dear Tom,

RJM Construction is pleased to present a preliminary estimate for the Bowie Ice Arena project located in Bowie, Maryland. Together with the City of Bowie and 292 Design Group, we can work as a team to deliver the project goals of cost, schedule and quality. Our estimate is based upon schematic drawings dated March 9, 2021.

Preliminary Estimate Total: \$18,064,643

CLARIFICATIONS:

- No. 1: This estimate assumes that all work will be done during regular business hours.
- No. 2: We do not include removing, storing or re-installing any systems furniture (*see owner costs*).
- No. 3: Phone, data, AV and security are all excluded (*see owner costs*).
- No. 4: Architectural and engineering fees are not included (*see owner costs*).
- No. 5: Our estimate does not include any SAC and WAC fees (*see owner costs*).

Thank you for the opportunity to provide this estimate. Our team is experienced and competent in your market; this applied knowledge will assist the team in obtaining the best possible project value. Please feel free to contact RJM if you have any questions or need additional information.

Sincerely,

A handwritten signature in blue ink that reads 'Bobby McCulloch'.

Bobby McCulloch
Senior Estimator

ESTIMATE DATE: March 15, 2022
PROJECT: Bowie Ice Arena
ARCHITECT: 292 Design Group
DRAWING DATE: March 9, 2022

DESCRIPTION	System Qty	Unit	\$/System SF	Base Estimate	\$/gsf 42,300
Construction Costs					
Footings and Foundations	42,300	SF	\$12.59	\$532,550	\$12.59
Structure - Joist/Deck	38,600	SF	\$30.00	\$1,158,000	\$27.38
Structure - Precast Plank (BOH Area)	3,700	SF	\$28.50	\$105,450	\$2.49
Precast Enclosure - Lobby Box - 18 Tall'	8,280	SF	\$60.40	\$500,140	\$11.82
Precast Enclosure - Rink Box - 28 Tall'	19,600	SF	\$36.38	\$713,000	\$16.86
Precast Enclosure - BOH Box - 18 Tall'	3,420	SF	\$45.70	\$156,300	\$3.70
Roofing	42,300	SF	\$28.00	\$1,184,400	\$28.00
Finishes and Buildout - Lobby/RR/Pro Shop	8,100	SF	\$85.00	\$688,500	\$16.28
Finishes and Buildout - Team Rooms	5,500	SF	\$60.00	\$330,000	\$7.80
Finishes and Buildout - Ice Arena	25,000	SF	\$19.00	\$475,000	\$11.23
Finishes and Buildout - BOH	3,700	SF	\$15.00	\$55,500	\$1.31
Lockers, Benches and Shelving	1	LS	\$75,000.00	\$75,000	\$1.77
Ice Rink System & Dasher Boards	1	LS	\$1,500,000.00	\$1,500,000	\$35.46
Bleachers	1	LS	\$150,000.00	\$150,000	\$3.55
Fire Protection	42,300	SF	\$3.00	\$126,900	\$3.00
Plumbing & HVAC	42,300	SF	\$35.37	\$1,496,000	\$35.37
Electrical	42,300	SF	\$25.73	\$1,088,290	\$25.73
Earthwork	121,000	SF	\$4.00	\$484,000	\$11.44
Site Utilities	121,000	SF	\$2.25	\$272,250	\$6.44
Underground Retention System	1	LS	\$150,000.00	\$150,000	\$3.55
Site Paving	8,849	SY	\$35.00	\$309,701	\$7.32
Site Concrete	42,300	SF	\$2.27	\$96,110	\$2.27
Retaining Walls	4,708	SF	\$34.00	\$160,072	\$3.78
Landscaping Allowance	1	LS	\$100,000.00	\$100,000	\$2.36
LEED Silver Certification	1	LS	\$2,750,000.00	\$2,750,000	\$65.01
General Conditions	46	WK	\$16,500.00	\$759,000	\$17.94
General Requirements	46	WK	\$6,000.00	\$276,000	\$6.52
General Liability Insurance	1	LS		\$127,954	\$3.02
Builders Risk Insurance	1	LS		\$35,457	\$0.84
Building Permit	1	LS		\$287,818	\$6.80
Sub Default Insurance	1	LS		\$138,395	\$3.27
Subtotal Construction Costs				\$16,281,787	\$384.91
Escalation	2.00%			\$325,636	\$7.70
Design Contingency	3.00%			\$488,454	\$11.55
Construction Contingency	3.00%			\$488,454	\$11.55
Contractor's Fee	2.95%			\$480,313	\$11.35
Total Construction Estimate				\$18,064,643	\$427.06

ESTIMATE DATE: March 15, 2022
PROJECT: Bowie Ice Arena
ARCHITECT: 292 Design Group
DRAWING DATE: March 9, 2022

Owner Costs Allowances			
SAC/WAC Fees	0.5%	\$90,323	\$2.14
Special Testing and Inspections		\$75,000	\$1.77
Construction Staking, Surveying, As-Builts		\$25,000	\$0.59
Owner Legal/Miscellaneous		\$40,000	\$0.95
Owner Furniture		\$35,000	\$0.83
Owner Equipment	Does Not Include Ice Resurfacer	\$50,000	\$1.18
Concession Equipment		\$100,000	\$2.36
Owner Artwork and Signage		\$30,000	\$0.71
Low Voltage (AV, Phone/Data, Security)	Includes Scoreboards	\$150,000	\$3.55
Subtotal Owner Costs Allowances		\$595,323	\$14.07
Design Fees			
Architectural & Engineering Fees		\$1,354,848	\$32.03
Subtotal Design Fees		\$1,354,848	\$32.03
Contingency			
Owner Contingency	3.00%	\$541,939	\$12.81
Subtotal Contingency		\$541,939	\$12.81
Total Project Estimate		\$20,556,754	\$485.98

Bowie Ice Arena Site Study

April 4, 2022

292 Design Group + Frederick Ward Associates + RJM Construction

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B32° + Nelson-Rudie & Associates

Big Picture Summary

2021: Previously studied renovation to existing ice arena

- Required improvements are extensive
- Cost of improvements high
- One of options included construction of a new arena on a new site

2022: Explored development of new building on new site

- Proposed site can accommodate single sheet arena & future expansion
- New arena elements comparable to existing



Team Member Expertise

292 Design Group

- Nationally-recognized ice design expertise

Frederick Ward Associates

- Local civil engineering expertise
- Subcontracted with Specialized Engineering for geotechnical evaluation
- Subcontracted with Traffic Concepts for traffic impact

RJM Construction

- National leader in community ice arena construction

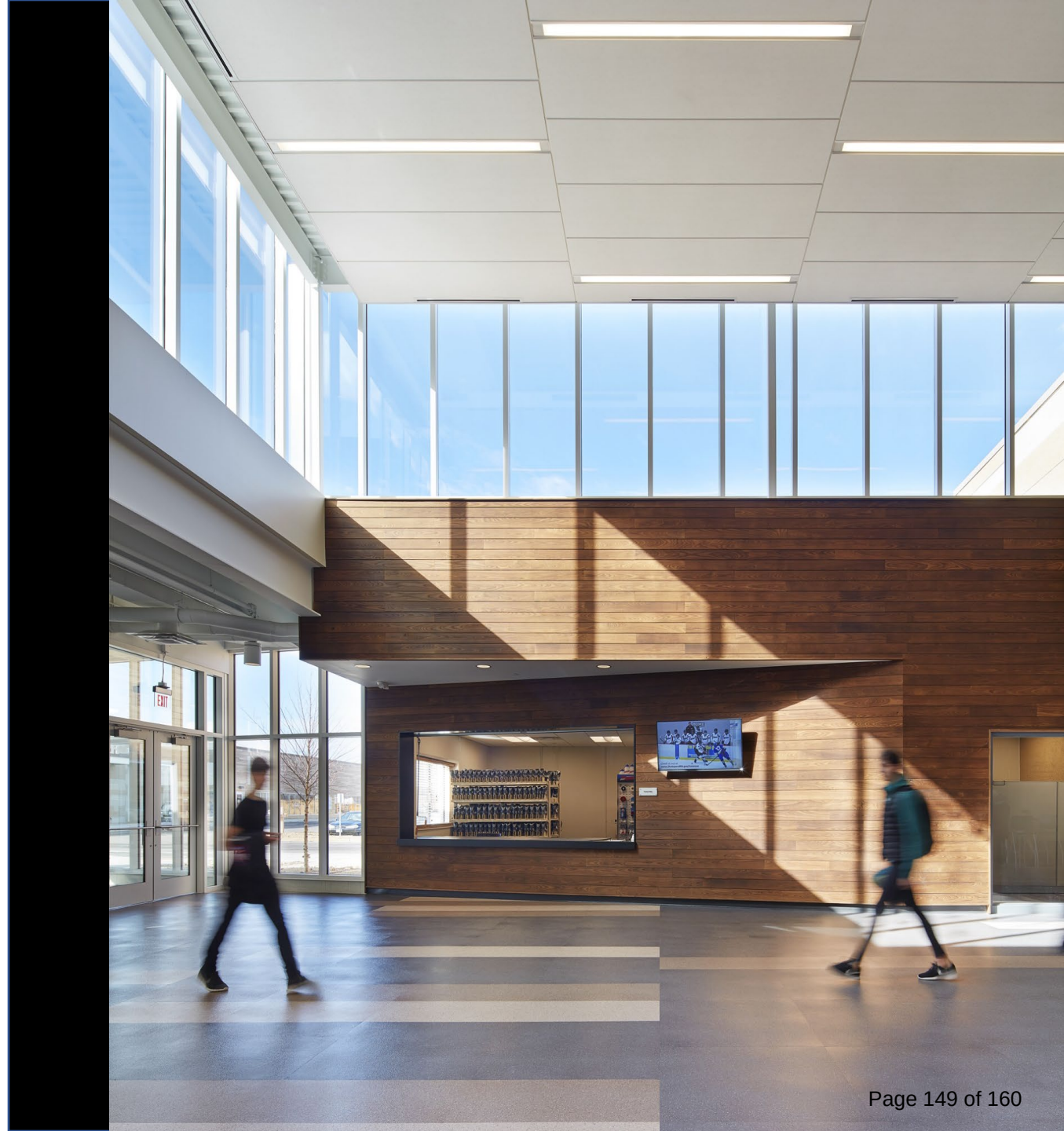
B32°

- Premiere refrigeration engineering firm
- Over 250 ice rink projects

Nelson-Rudie & Associates

- Structural, mechanical & electrical expertise
- Industry recognized ice arena HVAC expertise

Together, the 292 team has completed more than 40 ice arena studies, evaluations and constructed arenas—from community to NHL facilities.



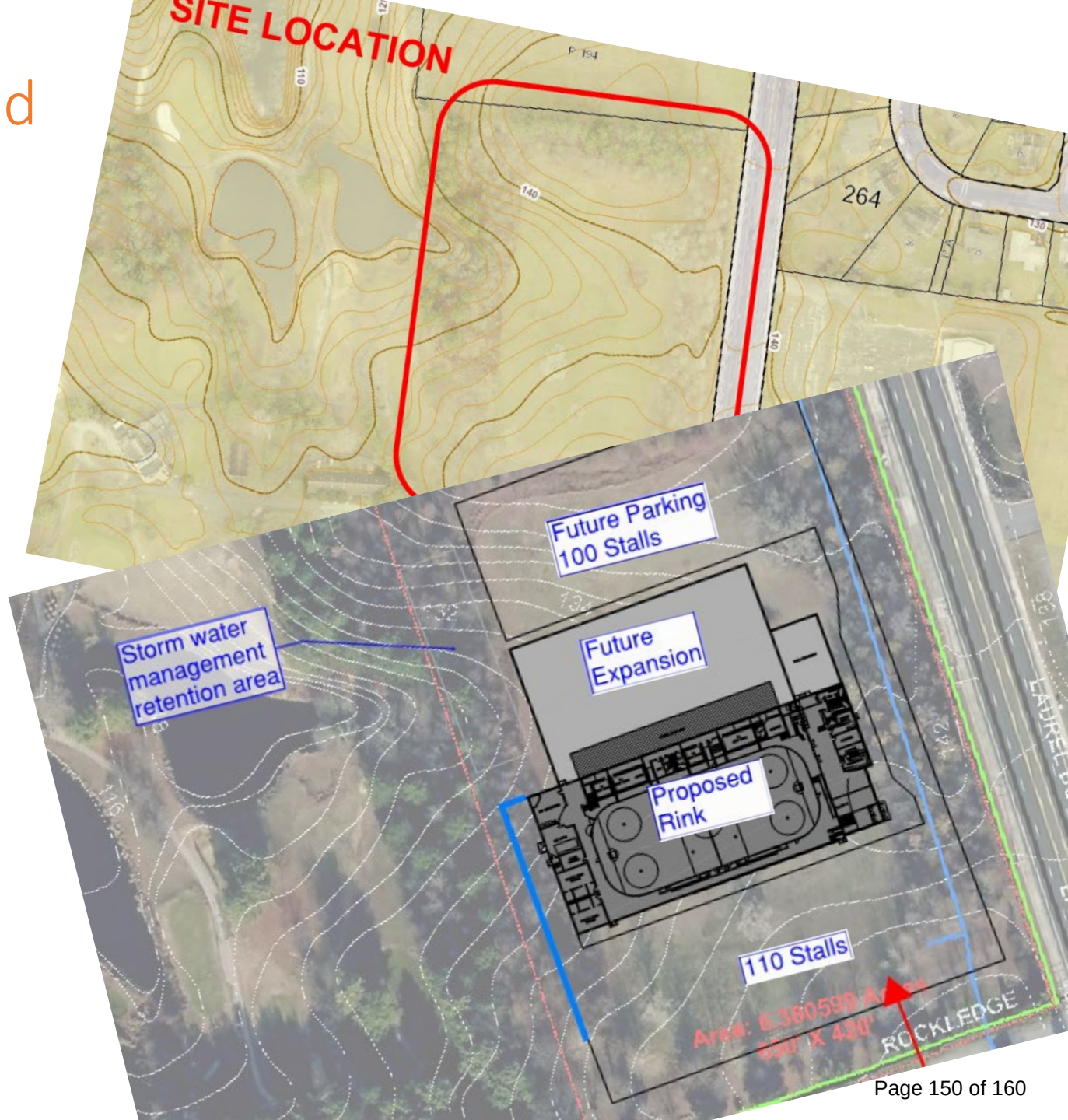
Study Process & Aspects Analyzed

3-Phase Approach

- Geotechnical evaluation & traffic study
- Programming & concept planning
- Budget estimate

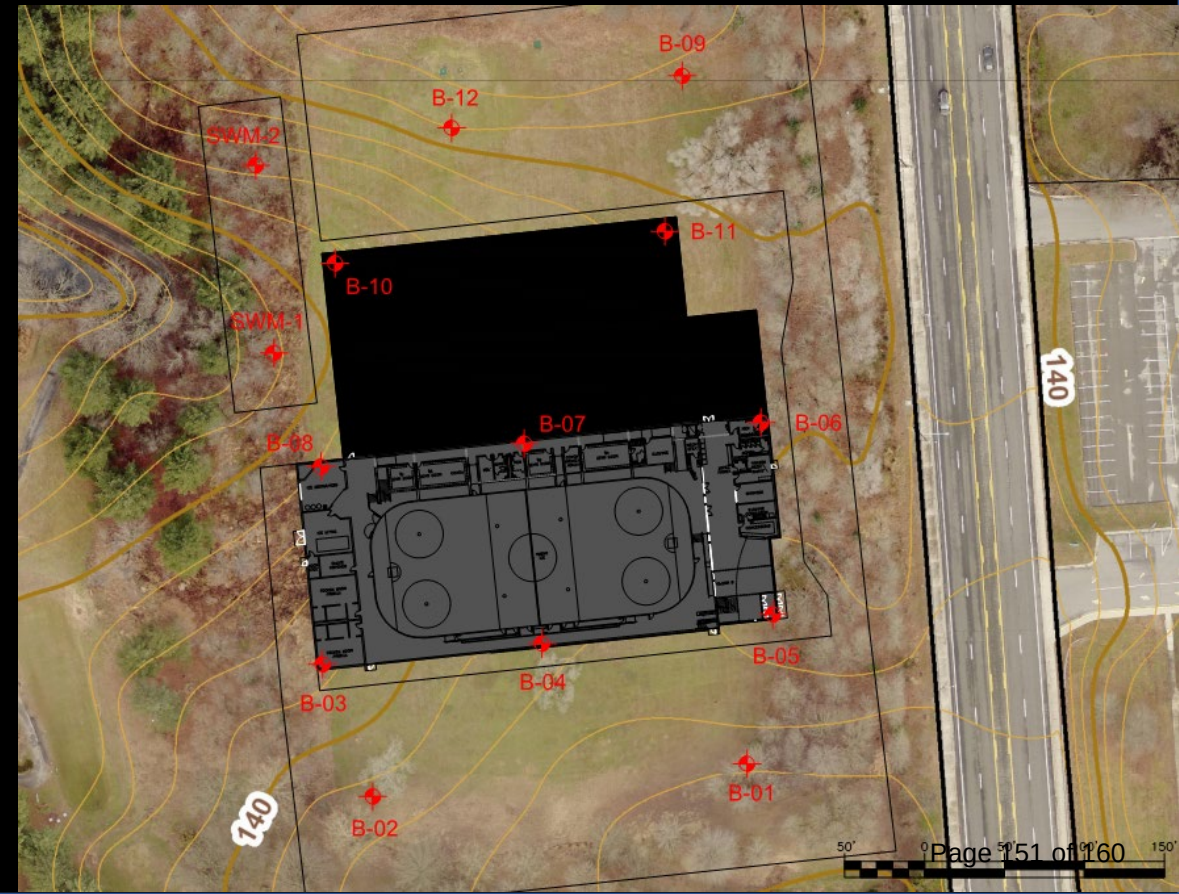
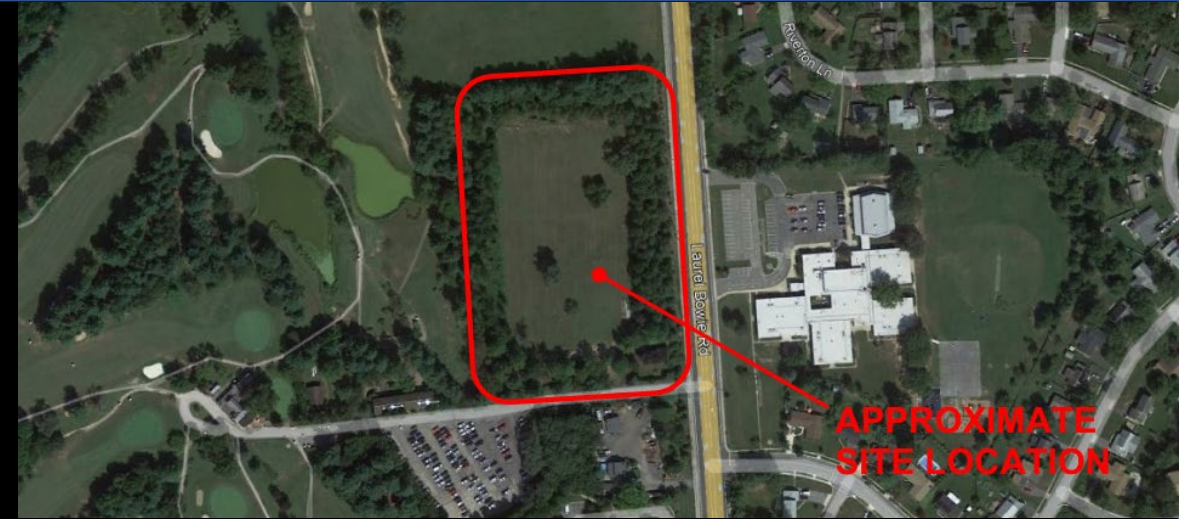
Study Components

- Soil conditions
- Ice arena program
- Concept site plan
- Concept floor plan
- Traffic analysis
- Estimate of probable cost



Geotechnical Evaluation

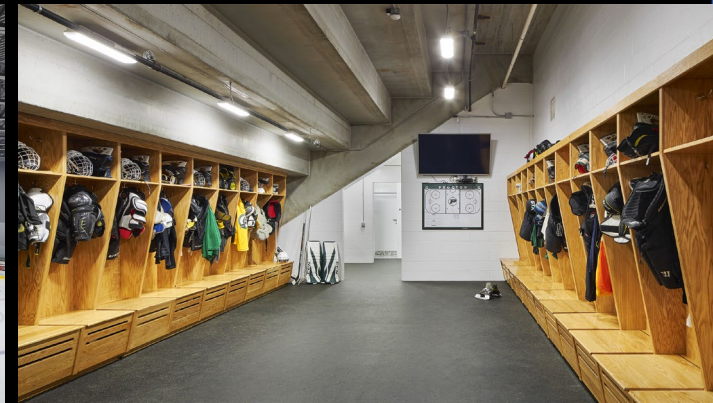
- 14 soil test borings
- Subsoil & groundwater conditions are adaptable
- Shallow foundations are adequate
- Potential alternate foundation system needed depending upon loading values
- Stormwater management BMP's utilizing infiltration are suitable



New Arena Features

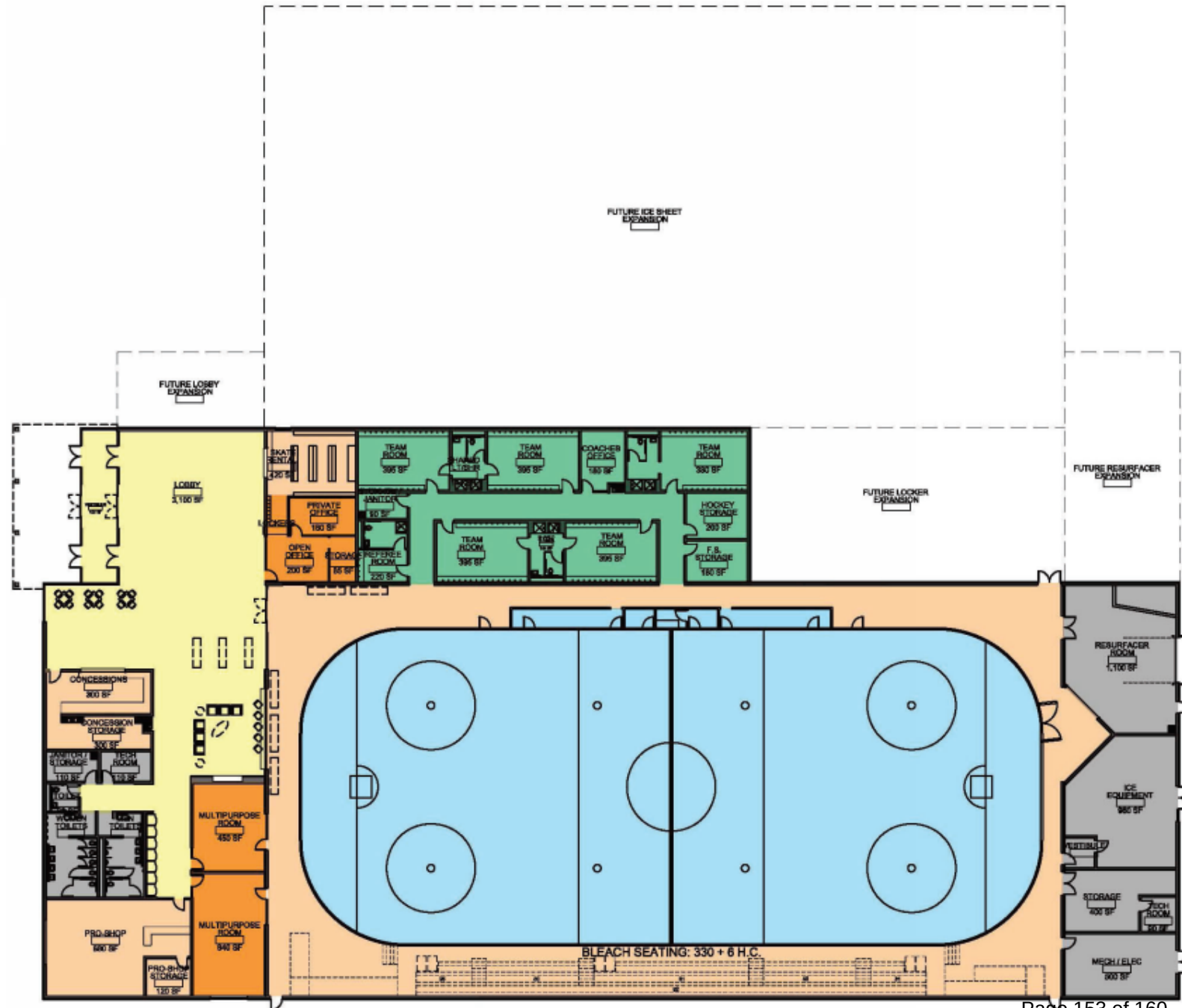
Based on amenities of existing arena

- NHL-size ice sheet
- Management office
- Lobby
- Seating for 330 spectators
- Concessions
- Meeting rooms
- Public toilets
- Pro-shop
- 5 team rooms
- Referee room
- Storage
- Ice resurfer room
- Refrigeration room
- Necessary support space



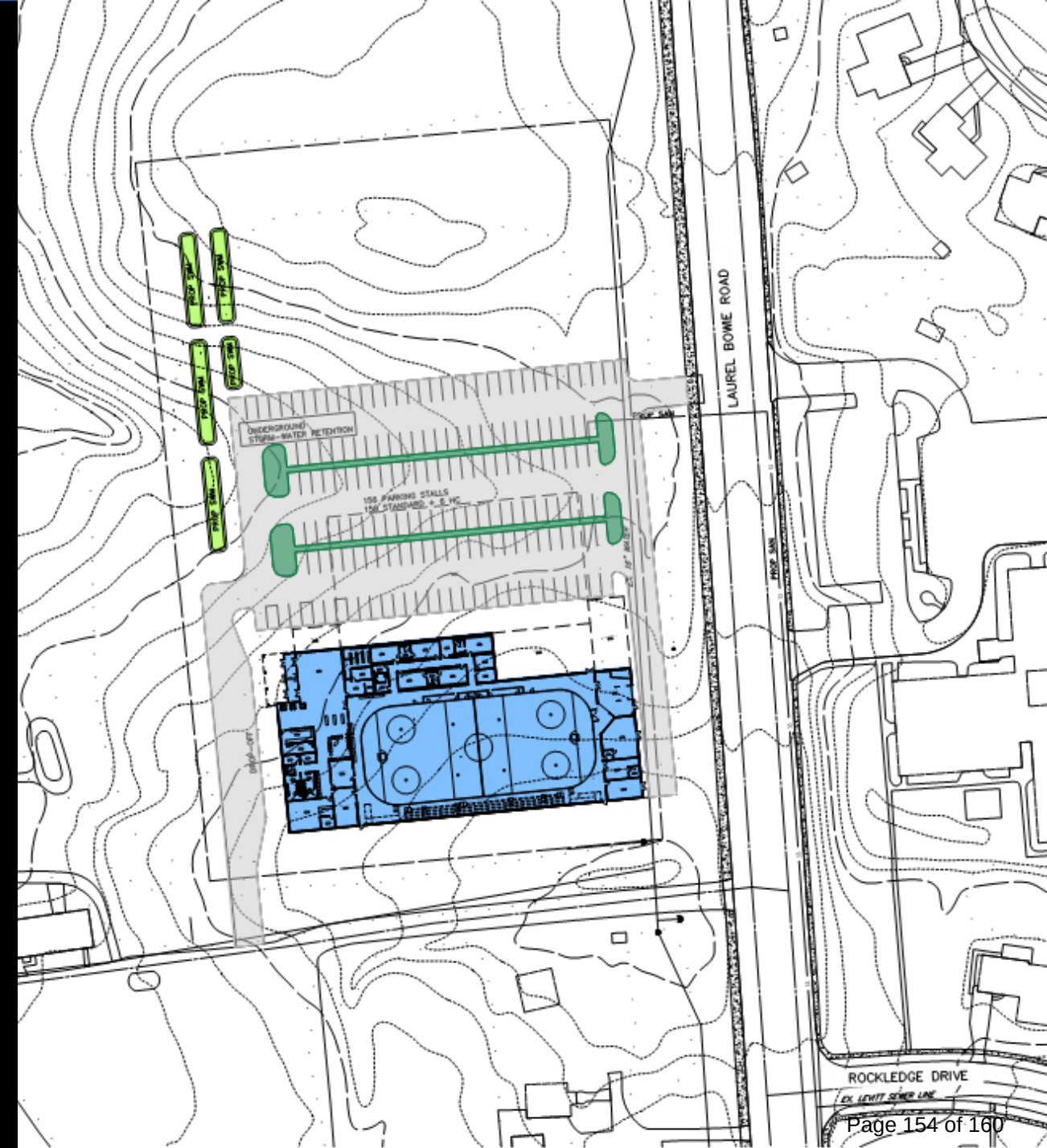
Concept Planning

- Lobby with access to offices, multipurpose, pro-shop and skate rental—visual monitoring by staff
- Offices & skate rental connection reduces staff
- Views from lobby into arena
- ADA restrooms sized to occupancy load
- Spectators and players separated
- Mechanical rooms separated from spectators and players



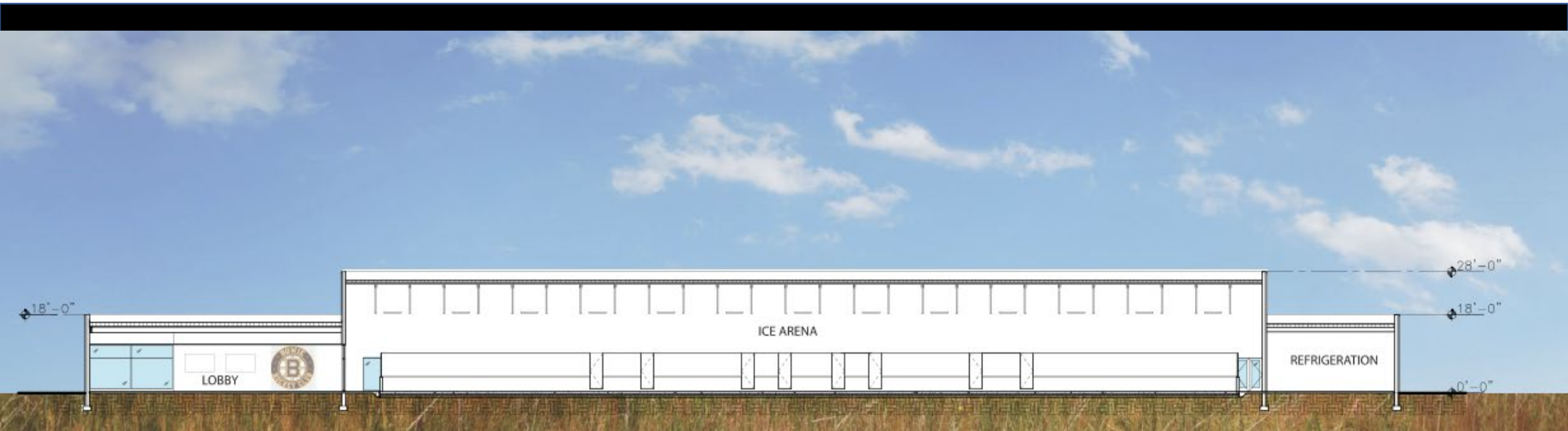
Concept Planning

- 292 in conjunction with City of Bowie design team members and FWA analyzed the site looking at a variety of factors
 - Building approach from the street
 - Parking
 - Stormwater drainage
 - Future expansion



Concept Planning – Building Section

- Important exploration for an ice arena
- 22' clear height
- “Heavy” mechanical systems – ensure proper clearances
- Relationship of spaces



Construction Systems

Architectural/Structural

- Insulated precast wall panels
- Long-span steel joists
- Perforated metal decking

Refrigeration

- Industrial grade with heat recovery for sub-soil heating
- State-of-the-art dasher boards

Mechanical

- Dehumidification
- Rooftop HVAC

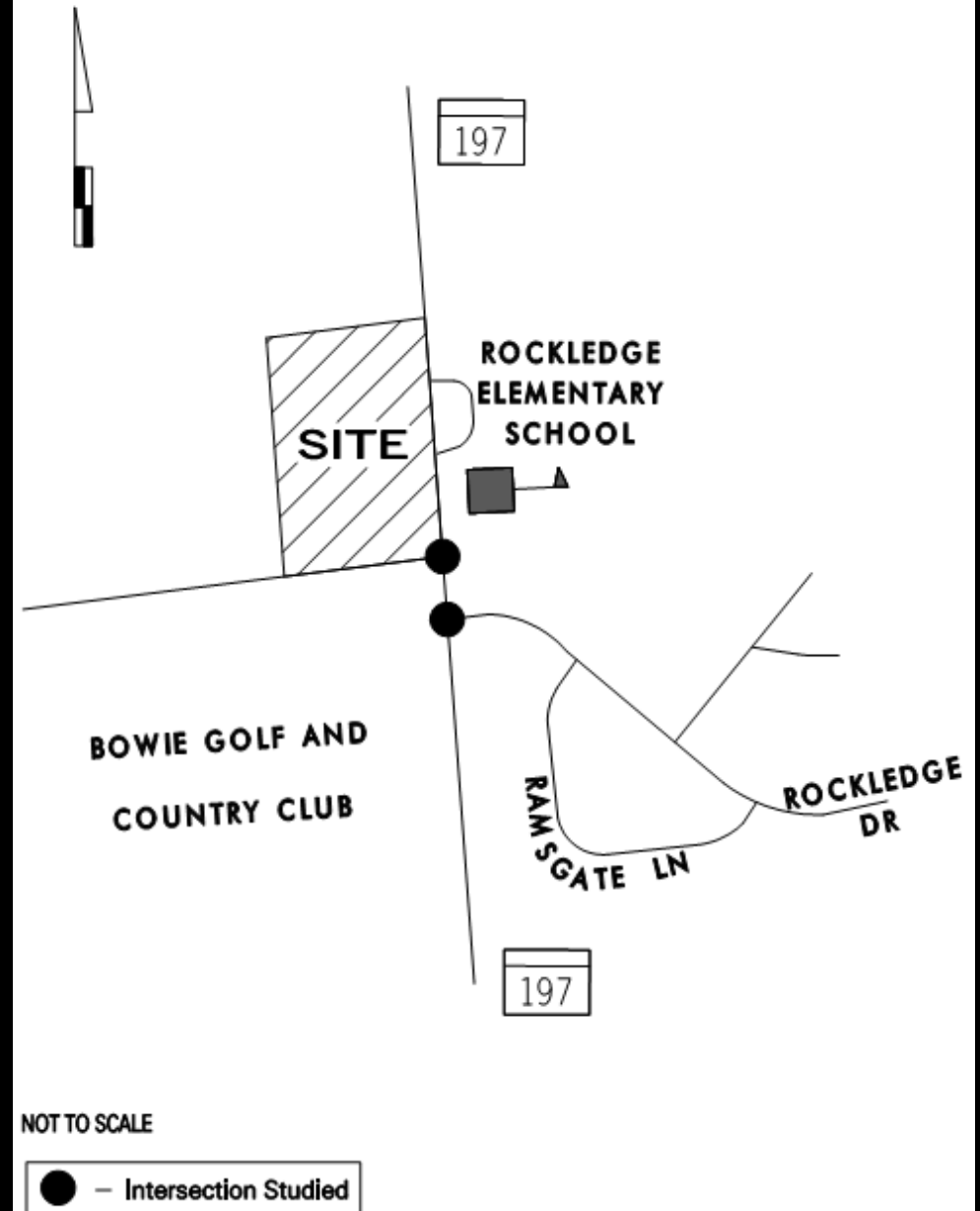
Electrical

- LED lighting



Traffic Study

- Weekday peak hour trip generation analysis
- Based on peak trip calculations, no full traffic impact study required
- Site access intersection would continue to operate at acceptable or better levels



Budget Estimate: Renovation

SYSTEM	\$ TOTAL ESTIMATED COST
Architectural	7,621,108.00
Ice System	1,500,000.00
Plumbing/Fire Protection/HVAC	1,622,900.00
Electrical	1,088,290.00
Site Work	1,572,133.00
LEED Silver	2,750,000.00
Escalation/Contingency/Contractor Fee	2,050,089.00
CONSTRUCTION ESTIMATE TOTAL	18,204,520.00
PROJECT ESTIMATE TOTAL	20,712,017.00

Next Steps:

Ice Arena Construction Delivery Process

- Traditional Design/Bid/Build
- Design Build
- CM Agency
- CM at Risk

Most Utilized Delivery Method

- CM at Risk (CMaR)
- 80% of ice arena's 292 Design Group has designed utilize this delivery process.
- Ice Arena's are unique projects with specialized systems.
- Integrates the CM (Contractor) early in the design process. CM can keep an eye on the market regarding supply chain and market conditions that may impact the project.
- CMaR maintains open public bid process.



Questions?

292 Design Group + Frederick Ward Associates + RJM Construction

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