

Springfield CBC Commuter Parking Garage Study

Final Report

April 18, 2014



Fairfax County Department of Transportation



Prepared by The Lukmire Partnership, Inc.



Springfield CBC Commuter Parking Garage Study

Errata Page

Since the study's completion, further discussion with Fairfax County Zoning officials indicate that the project can use by right the zoning requirements in the Springfield Commercial Revitalization District. This will reduce the front yard setback to 20' and will increase the maximum building height from 40 ft to 50ft.

The study makes continuing references to the 40 ft. height restriction. During the final design phase of work, the following alternatives, taking advantage of the height increase. should be studied:

- Increase floor-to-floor height to improve flexibility in designing the structural frame.
- Add rooftop recreation level w/out need to apply for Zoning exception. This would make the total facility 5 stories tall, provided toilets, storage, etc. for the recreation level were located on the 5th parking level below.
- Increase number of parking levels to six = 5 story structure.
- Replace basement parking with an additional parking level = 5 story structure..

Fairfax County Public Facilities Manual calls for buildings greater than 5 stories or 50 ft. to be provided with fire truck access to front and rear. This is discussed in on Page 34. In the case of the recreation level, the toilet and storage facilities could not go on the roof without triggering the fire truck access discussion.

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Project Team

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Jeff C. McKay, Lee District Supervisor	Fairfax County Board of Supervisors
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I. Executive Summary

The Springfield Parking Study was commissioned by Fairfax County Department of Transportation to analyze various site options for a proposed intermodal transit facility in Springfield, Virginia. The transit facility is to include bus transfer station, long-term parking and car pool pickup functions. The site is located within the Springfield Central Business Center (CBC); the project is part of the County's efforts to stimulate revitalization of the Springfield Central Business Center. Five initial site configurations were studied to determine the best possible site for the facility. Also analyzed were options to provide recreational facilities as means to maximize use of the site and assist in revitalizing this area of Springfield.

Recommended Options

Two recommended options evolved from the study, Options 1 and 3, which are discussed here. The evolution of all four options is discussed in subsequent sections of the Study. As there is virtually no difference in access, traffic impacts or long term function to any of the four sites studied, Option 1 becomes the preferred scheme, being the least complicated (therefore fastest) to develop.

While the larger land area of Option 2 would have more layout flexibility, as discussed later the Option 1 site meets the County's program without the additional complications of land acquisition and joint use development. Option 1 also leaves the adjacent sites open for future commercial development, which is precluded in Option 2. Option 3, originally evaluated as a standalone alternative site, evolved to become a logical future expansion of Option 1, should the two properties to the east of the County's property not be developed in the meantime. Option 4, the last of the four site options studied, created the least attractive site for use as a parking structure given its offset shape, and was dropped from consideration.

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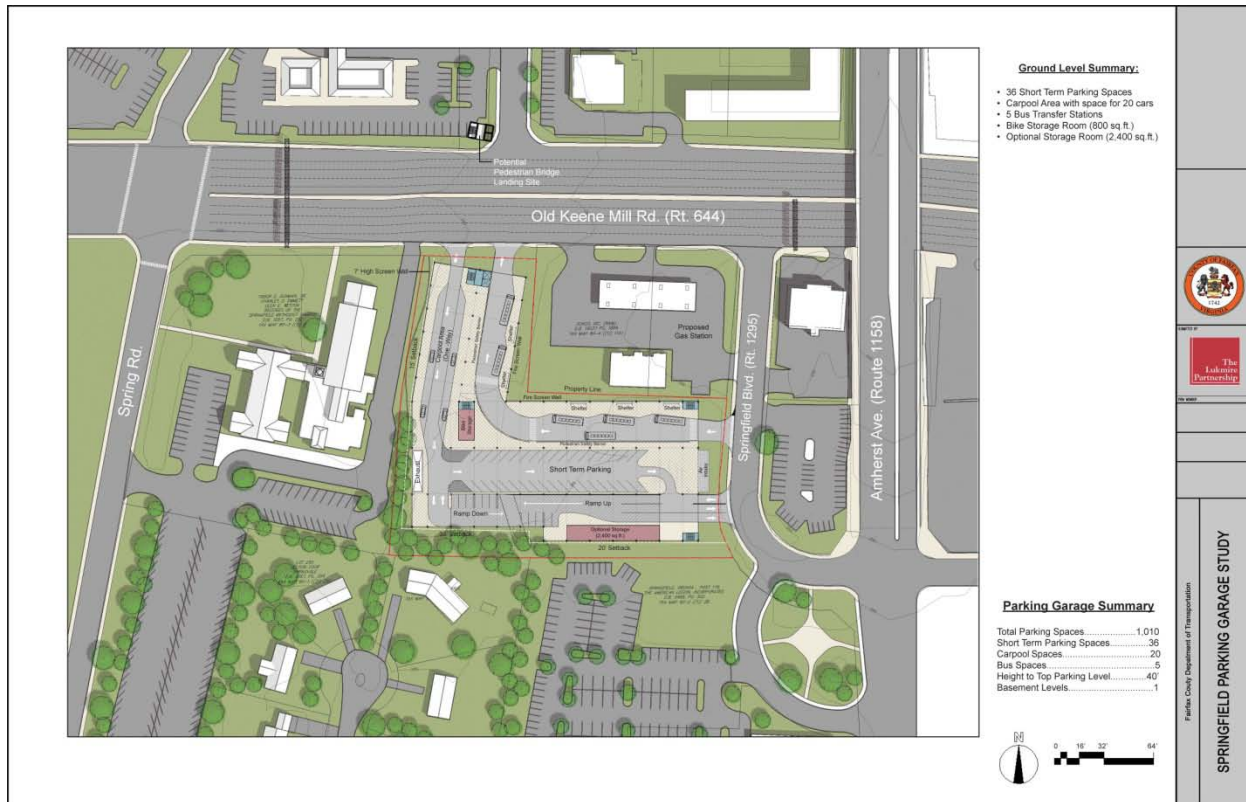


Figure 1 - Option 1 Site Plan (as presented at May 8 '13 Public Meeting)

Key Features of Option 1

- The County program is achieved on the Option 1 site.
- This site is currently owned by the County.
- No land takes are required; therefore the acquisition process, with uncertainties of cost and time, is avoided.
- This site is already zoned for this use.
- Initial discussions w/ Fairfax County Department of Planning & Zoning confirm that the County's program can be met on the Option 1 site.
- Option 1 has least visual impact on Old Keene Mill Road, with the bulk of the facility set back from the road.
- Option 1 does not prohibit redevelopment of key frontage along Old Keene Mill Road now or in the future.
- Expansion of this option can be achieved with the acquisition of additional property described in Option 3.
- This option is capable of adding a recreational level over the parking levels, with a Zoning variance from the 40 foot height limit.

Program Elements- Ground level facilities include up to 5 bus bays in the bus transfer station and associated shelter amenities; 20 carpool (aka 'slug') spaces with 4 'slug' queue positions and associated

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shelter amenities; short-term / drop off for 36 vehicles; bicycle storage room, community storage facility, and access to long-term parking. Pedestrian barriers with controlled crossings of the bus lanes direct pedestrian traffic from the drop off areas to the bus transfer station.

Option 1 requires 1 basement level to provide 1,010 long-term parking spaces, and keep within the 40 ft. zoning height limit.

Should a rooftop recreational level be included in the final design, a Zoning height exception would need to be sought. Also, as discussed in [Preliminary Building Code Analysis](#) to follow, fire truck access is required for structures exceeding 5 stories or 50 ft.

Access - Eastbound bus access from Old Keene Mill Rd is via Springfield Boulevard. Westbound bus access is from Amherst Ave via Springfield Boulevard. Bus circulation is one way, with all buses exiting onto eastbound Old Keene Mill Road. Timing of the existing signal at Spring Road immediately west of the site should be studied to insure sufficient time for exiting buses.

Vehicle access for carpool 'slug' pickup and short-term parking is from eastbound Old Keene Mill Road, with traffic exiting the facility via Springfield Boulevard merging with the exiting long-term parking users. Long-term commuter parking access is via Springfield Boulevard. Access to the long-term basement parking is limited, coming only from eastbound Old Keene Mill Road. Due to concern by VDOT, the short-term and long-term commuter vehicles are merged inside the garage before exiting onto Springfield Boulevard. This minimizes the number of entrances and their concurrent street congestion; however the limited access points may prove an awkward arrangement inside the garage. This joint carpool/short term/long term exit could also complicate a future conversion to a paid parking system.

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Figure 2 Option 1 Ground Level

Option 1 – Ground Level: Arriving buses are segregated from vehicular traffic within the facility. Bus bays are located adjacent to pedestrian zones with pedestrians arriving from both streets and the pedestrian bridge spanning Old Keene Mill Road. Pedestrian barriers provide controlled crossing points from the vehicular drop offs to the bus area.

Immediately adjacent to the bus transfer area are the carpool pickup 'slug' queues and short term parking areas. This plan above illustrates one of several possible pickup and short term parking alternatives. The carpool pickup shows four pickup queues with 4-5 vehicle spaces in each queue. This area is completely under cover of the structure and would be a significant improvement over the current situation. The illustrated short term parking area would be used for carpool and bus patrons alike.

Alternatively, placing the short term parking area ahead of the carpool pickup points should be evaluated during final design, as should employing a Kiss & Ride configuration for short term parking. One such alternative layout is shown in Figure 3. During the public meeting, concern was expressed that entering traffic from Old Keene Mill Road during heavy rush hour conditions could require additional 'back up' space than is shown in Figure 2. By reversing the relationship with the short term drop off, this back up space is provided.

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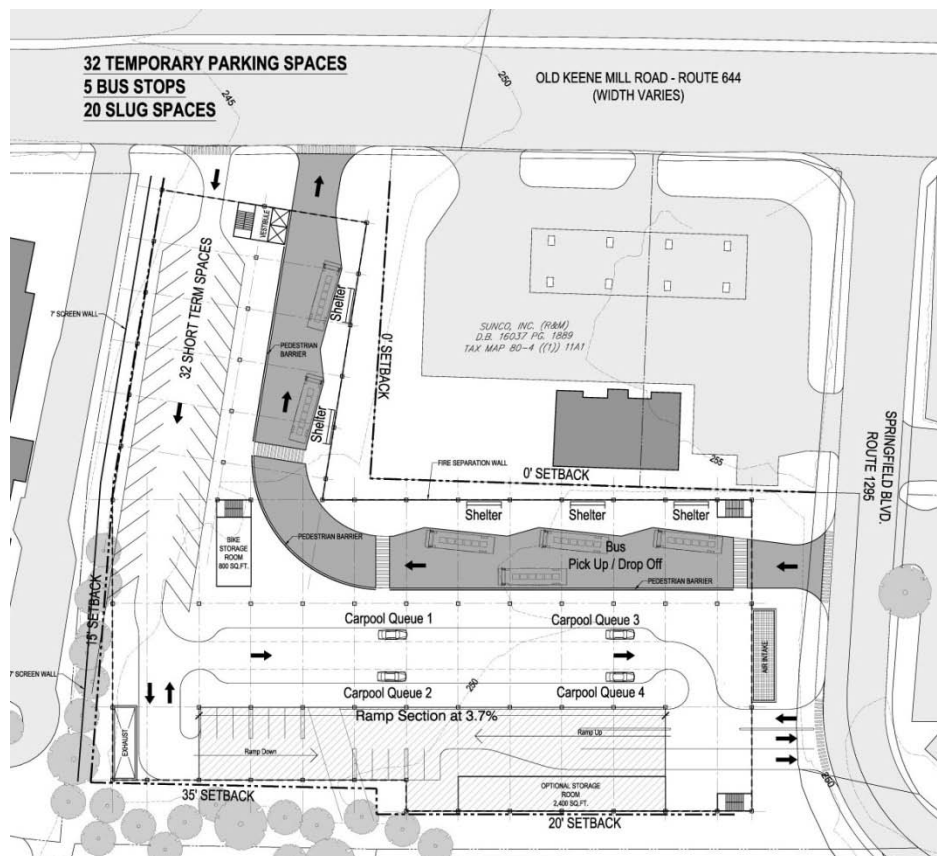


Figure 3 - Option 1 alternative carpool drop off & short term parking

Long term parking is divided into two separate areas within the facility, basement and upper levels. The basement level can be reached only from Old Keene Mill Road and the upper levels only from Springfield Boulevard. Due to the multiple functions occurring at ground level and one-way traffic through the carpool / short term parking areas, it is not possible to link the basement and upper levels, however this limitation is not what it might be if this were a commercial facility, since the facility will be familiar to most commuter patrons.

The parking ramp at 270' is at 3.7% slope. The ramp is located at the southernmost bay to allow the carpool / short term parking areas to be adjacent to the bus bays for best pedestrian circulation between these functions.

The basement level illustrated does not extend into the NW area shown for the upper levels. If the parking total can be met without building the basement level under the NW area, the project will save the expense of that construction.

The Second Level is a partial level as well, allowing the bus bays to be double height. Third through Fifth Levels build out the entire footprint, as does the rooftop recreational facility.

Option 1 locates the potential pedestrian bridge as shown in Figure 5. See Page 27 for bridge discussion.

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Option 1 Plans



Figure 4 -Option 1 Basement Parking Level



Figure 5 - Option 1 Second Parking Level

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Figure 6 - Option 1 Parking Levels 3 through 5

Traffic Study

It is recommended that an updated traffic study be performed prior to final design of the facility to determine:

- Projected carpool pickup demand.
- Projected short term parking demand.
- Projected pedestrian traffic arriving from Old Keene Mill Rd and from Springfield.
- Projected traffic on Old Keene Mill Rd and Springfield Boulevard and impacts of the garage on traffic in the surrounding area.
- Projected AM and PM parking peaks, including maneuverability of vehicles at the facility's entrances, and projected queues within the garage for exiting traffic.
- Bus routes to be accommodated by the transit facility, projected volume and maneuverability to entering and exiting the garage.
- Traffic volumes for an expanded garage per Option 3.

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Rooftop Recreation Facility

The selected site of Option 1 provides potential rooftop recreational facilities. Initial discussions with Fairfax County Park Authority did not get to a defined program during the Study; however the following observations can be made:

- The Option 1 site is too narrow for full size field sports such as soccer, baseball or football. This remains true for Option 3 as well.
- Fairfax County Park Authority would like to see a running track at the perimeter around 'mini' multipurpose sports fields such as shown below.
- Given the location atop the transit facility, adults are the most likely users of this recreational facility. As such, the potential impacts (noise levels and nighttime lighting) need to be carefully studied.
- With the height restrictions imposed by Zoning, toilet facilities should be located to the 5th parking level, with an attendant loss of spaces. Office / storage space should also be located on the 5th parking level.



Figure 7 - Option 1 Rooftop Recreational Level

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Option 1 Elevations

North Elevation illustrates what is seen from Old Keene Mill Road and includes the pedestrian bridge in the foreground at right. This is the primary elevation and should be sufficiently well identified to distinguish the facility, and promote the revitalization of the Springfield CBC. The illustrations include the rooftop recreation facility, with graphic screen walls proposed to add visual appeal to the facility and advertise the recreational facility.

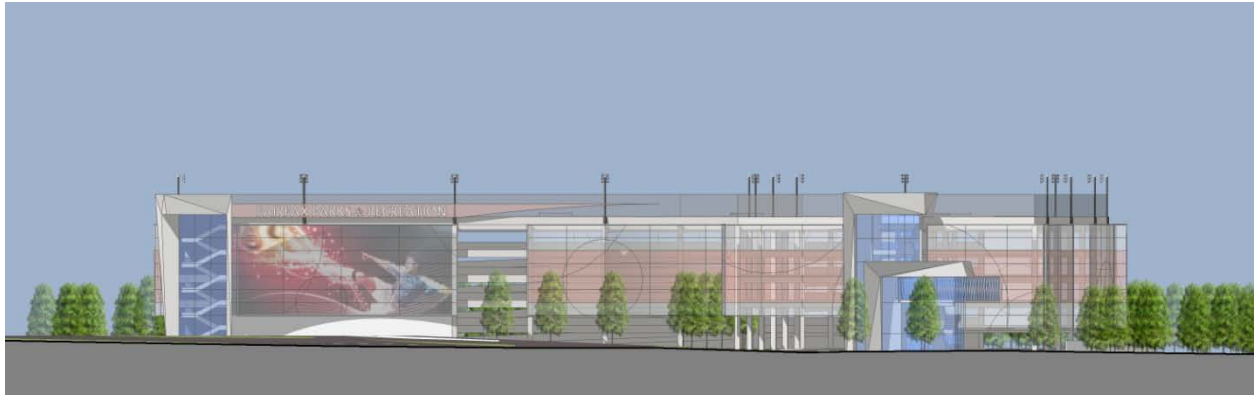


Figure 8 - Option One North Elevation

South Elevation This elevation what is primarily seen from the American Legion property and several adjacent residential properties to the southwest of the site. Grade is illustrative and may require retaining walls to meet existing grades. Because the parking ramp is against this side of the facility, pedestrian access to the facility will be via the sidewalk included in streetscape along Springfield Boulevard.

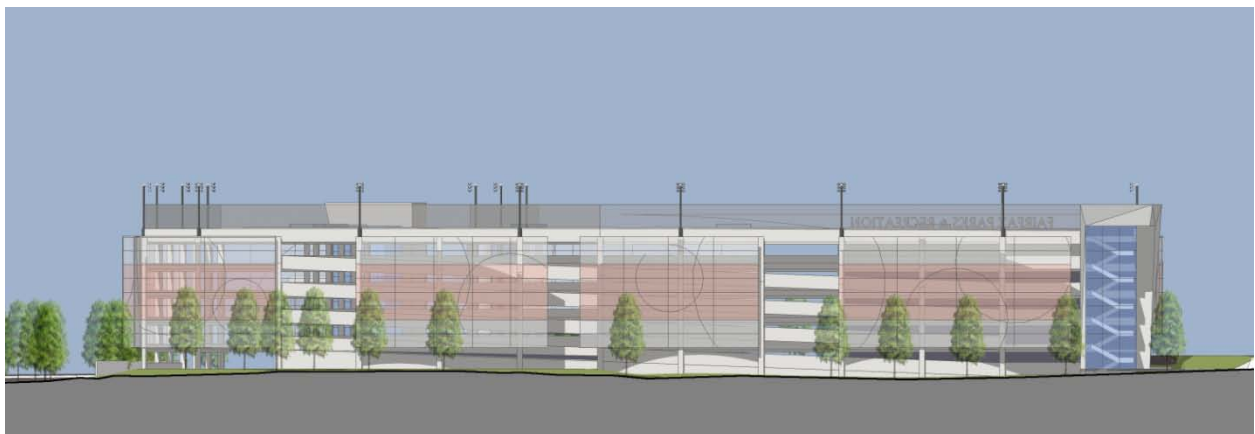


Figure 9 - Option 1 South Elevation

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East Elevation This illustrates what is seen from Springfield Boulevard and the American Legion Bridge to the east of the site. Entrances and exits for long term and short term parking are shown in the first bay at the left, and the bus exit is shown at the third bay from the left.

Beyond, and to the right of the facility is the optional pedestrian bridge over Old Keene Mill Road. The bridge is illustrated as an open, story-high box truss structure with glass wind screens and roof. Elevator and stair access to grade is provided for both ends of the bridge. Should the County chose to build this program element, the opportunity to make this an exciting gateway should not be missed.



Figure 10 - Option 1 East Elevation

West Elevation This illustrates what is seen from the adjacent church property. To the north of the facility (left in elevation) is the optional pedestrian bridge over Old Keene Mill Road. At the base of the facility, the 7 ft. screen wall discussed in the Zoning Analysis is illustrated. Grade and the height of this wall are important design considerations that need to be addressed in the final design to ameliorate the impact of the taller facility against the church property.



Figure 11 Option 1 West Elevation

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Pedestrian Bridge

Given Old Keene Mill Road's nine lanes of heavy traffic passing in front of the site, a pedestrian bridge is recommended to provide a safe, convenient route for pedestrians coming from north of the road to the facility. With increased pedestrian volumes anticipated, relying solely on the signal at Spring Road to provide safe passage from the north would likely require increasing the walk time. The pedestrian bridge would also allow flexibility in scheduling westbound buses on Old Keene Mill Road, allowing local routes to avoid circling through Springfield to arrive at the facility. It would also allow the County to continue leasing parking spaces in Springfield Plaza, augmenting the commuter program should that prove necessary.

The study looked at several landing points at Springfield Plaza on the north side of Old Keene Mill Road for the bridge. The best location, considering the Option 1 site, is located at the western corner of Bland Street and Old Keene Mill Road. The elevator and stair structure (visible in the 3-5 parking level plans) would be fitted into the corner of the existing parking lot for Wachovia Bank, with minimum loss of parking spaces.

Given the width of Old Keene Mill Road, the bridge structure will require long span trusses in the range of 10-12 ft. deep to span the entire road, and sidewalks. The bridge would land at the 3rd Level of the facility (+/- 20 ft. above grade), allowing for proper clearance over the road. As this will be a very visible structure, attention to making it a visually exciting one is important. As important is ensuring pedestrian safety and comfort to encourage its use.

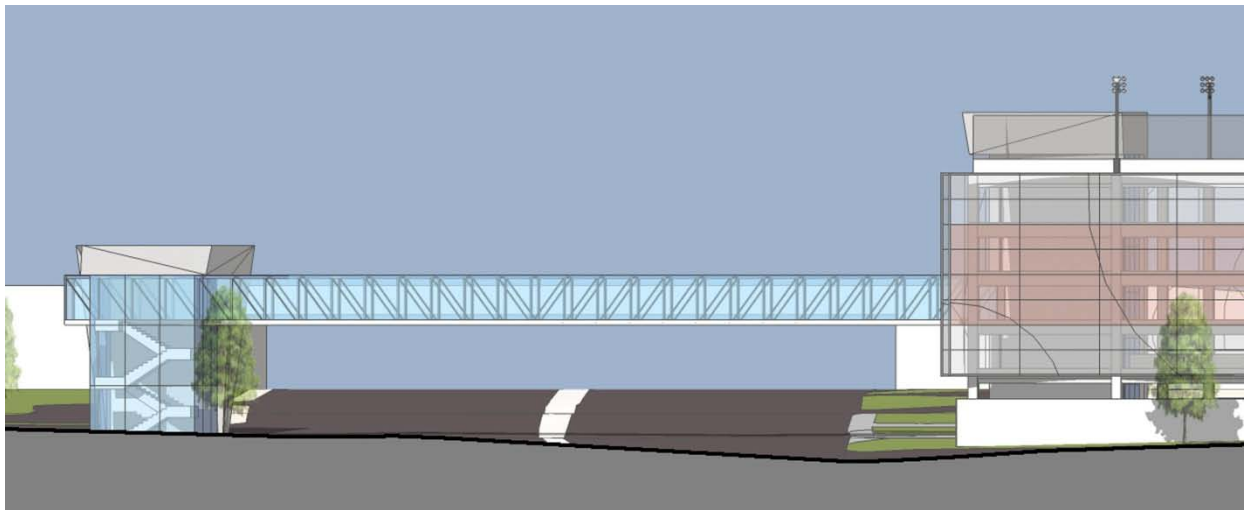


Figure 12 Optional Pedestrian Bridge

Option 3 (Future Expansion)

Option 3 offers the best means to expand the facility, should the County decide to pursue future land acquisitions.

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- This option offers a realistic way to expand the County’s facility at a future date, and allow for redevelopment of the underused property facing Old Keene Mill Road.
- The expanded facility of Option 3 has the least visual impact on Old Keene Mill Road.
- The expanded facility of Option 3 avoids restricting redevelopment of the Old Keene Mill Road street frontage.
- This option provides for a much increased parking count.
- This option provides for much larger recreational area.
- This option provides for landscaped bus entrance from Old Keene Mill Road.
- This option addressed how the internal circulation could help offset a lack of entry/exit lanes at the street edge.

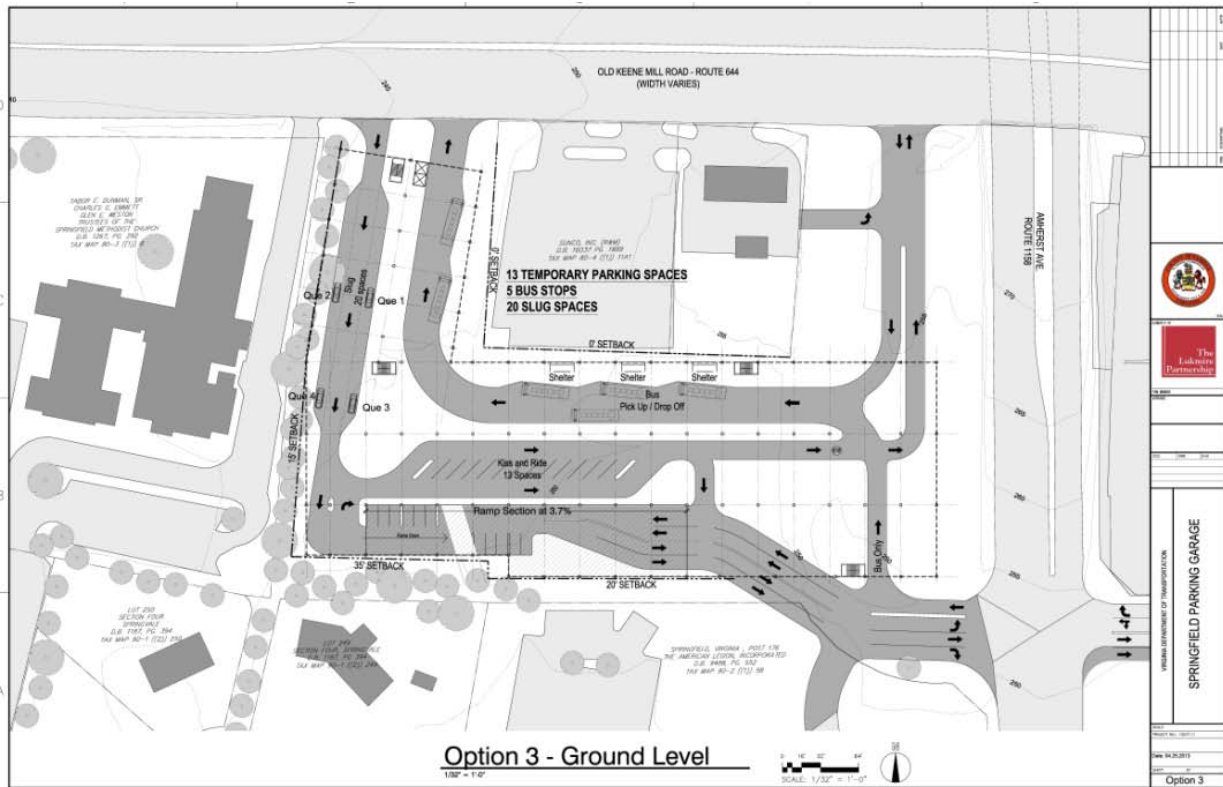


Figure 13 - Option 3 Ground Level

Option 3 Program Elements – This plan represents how the initial site might be further developed with the acquisition of the two parcels on the east side of Springfield Boulevard. In this scheme, Springfield Blvd is closed as a public street, replaced by the bus drive into the facility and the garage is extended eastward.

Ground level facilities include 5 bus bays in the bus transfer station and associated shelter amenities; short-term / drop off for 13 vehicles in a Kiss & Ride arrangement; 20 carpool (aka ‘slug’) spaces with 4 ‘slug’ queue positions and associated shelter amenities; bicycle storage room, community storage

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facility, and access to long-term parking. Pedestrian barriers with controlled crossings of the bus lanes direct pedestrian traffic from the drop off areas to the bus transfer station.

The basement built in Opt 1 can either remain as in Option 1, or be extended if additional spaces are required. As shown in Option 3, a total of 1,277 long-term parking spaces are available. This expansion remains within the 40 ft. zoning height limit.

Discussion regarding Zoning exception for a rooftop recreation facility as in Option 1 also applies to this option. See Option 1 Program Elements.

Option 3 Access Eastbound bus access from Old Keene Mill Rd is via new entrance drive replacing Springfield Boulevard. Bus access road shall also provide means for tanker trucks to exit the adjacent Sunoco gas station site. Westbound bus access is from Amherst Ave via Springfield Boulevard. Bus circulation is one way, with all buses exiting onto eastbound Old Keene Mill Road. Timing of the existing signal at Spring Road should be studied to insure sufficient time for exiting buses.

Eastbound vehicle access (for carpool 'slug' pickup and short-term parking) is from Old Keene Mill Road, with traffic exiting the facility via Amherst Avenue, merging with exiting long-term parking users; alternatively, the carpool / short term parking can exit with the buses back onto eastbound Old Keene Mill Road. Limited access to long-term parking is also available from eastbound Old Keene Mill Road. Long-term commuter parking access is via Amherst Avenue.

The combined vehicular entrance/exit shows multiple lanes which are likely to require a minor land take from the American Legion, adjustment to their entrance, and a possible road widening at the Springfield Blvd intersection with Amherst Avenue. Given the increased size of the garage, this entrance should be carefully studied during design of an expanded facility. Recommendations for an expansion to Option 3 should be included in the traffic study recommended at the start of final design.

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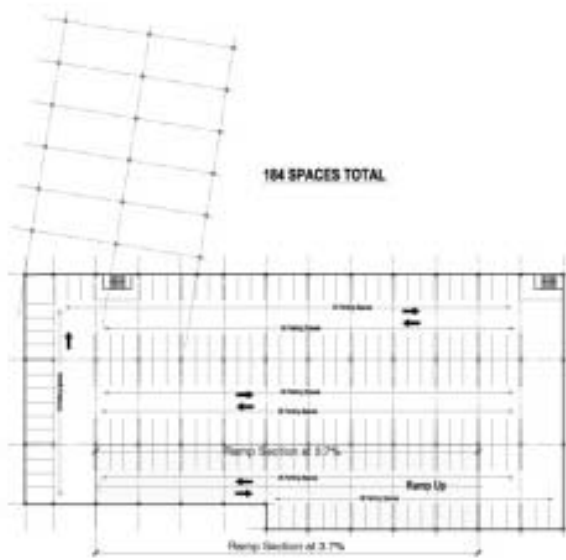


Figure 14 - Option 3 Basement Level

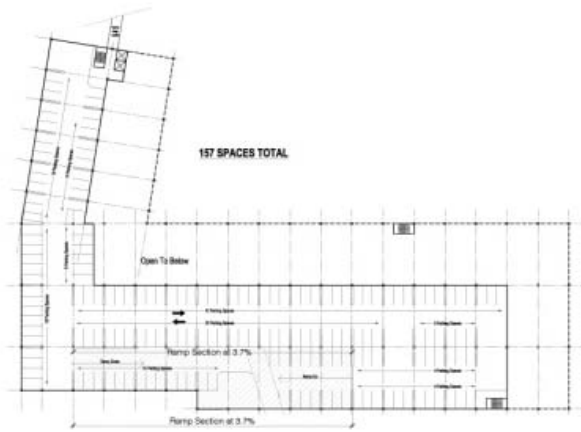


Figure 15 Option 3 Second Level

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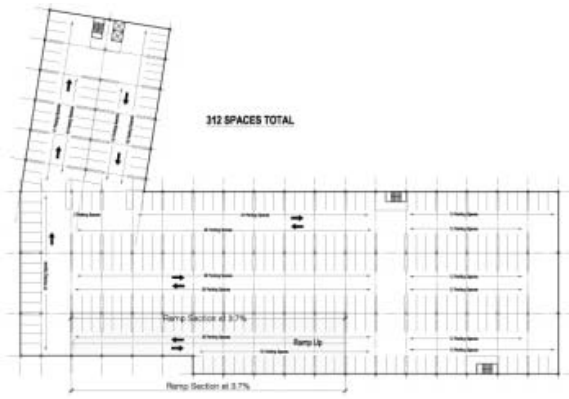


Figure 16 – Option 3 - Levels 3 through 5

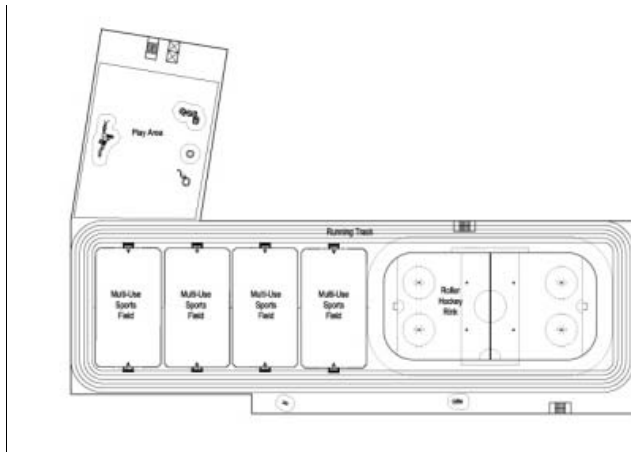


Figure 17 - Option 3 Rooftop Recreation Facility

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II. Project Parameters

Background

The existing site is bounded by Old Keene Mill Road and a Sunoco gas station to the north. It is bounded by Springfield Blvd to the east, to the south by the American Legion site and a residential cul-de-sac, and to the west by the Springfield United Methodist Church property. The Sunoco property is currently being redeveloped, continuing its use as a retail gas / convenience store facility.

The former site of a Circuit City retail store, the existing site was purchased and redeveloped by the County as a surface commuter lot, also incorporating an informal carpool “slug line” operation. The existing commuter lot has 278 spaces. Commuter parking is augmented by the County through leasing 261 spaces at adjacent parking lots at the American Legion, Springfield United Methodist Church and the several shopping centers north of Old Keene Mill Road

The long standing carpool ‘slug’ pickup operation evolved to augment under-sized carpools wanting to use the I-395 HOV lanes. Originally located directly beside Old Keene Mill Road, as traffic grew, safety concerns also grew for cars slowing to pick up passengers. The pickup point increasingly became a safety hazard as well as contributed to the congestion itself. When the present site came on the market, the decision was made to remove the slug operation from roadside and bring it into the commuter lot. Initial resistance has led in time to a well organized system.

Presently the slug line is self organized with three standing pick up points for passengers traveling to destinations in the Washington, DC. Car pools presently pick up riders from the slug line to use the HOV lanes on I-95 commuting to and from Washington, DC. The “slug line” operates uniquely in that cars arrive in queue to pick up random riders from specific three carpool pickup points. This is the opposite of what occurs at most commuter lots where carpools are formed by persons known to each other, meeting to use the HOV lanes. The slug operation might be likened to an ‘odd lot’ outlet store for commuter carpools.

The study team visually observed typical morning rush hour conditions, and traffic counts were taken April 25, ‘13. By 8:45 AM the commuter lot appeared to be full. By 9:30 AM, the carpool function was mostly complete. The three ‘slug’ queue positions handled 3 to 4 vehicles in each stack before clearing. Traffic exiting back onto eastbound Springfield Blvd did not appear to have a difficult time doing so; the light at Spring Road holds traffic long enough to allow the exiting traffic to clear the parking lot.

Proximity to the Springfield Interchange The single more significant condition affecting the site’s use is its immediate proximity to the Springfield Interchange; this is both its attraction for an intermodal transportation facility and its largest complication. Traffic patterns in the immediate vicinity of the existing site were altered significantly with the Veterans Bridge project in conjunction with a number of street re-routings in an effort to untangle the local congestion. Further redevelopment of the road patterns occurred with the redesigned Springfield Interchange completed in 2007. The resulting road network has created unique circulation patterns, particularly for the buses serving the area. The site can be accessed directly from Old Keene Mill Road only in the eastbound direction. Eastbound Old Keene

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Mill Road directly connects to the Springfield Interchange (including the I-395 HOV lanes to Washington DC) so morning rush hour traffic is significant.

The site can also be accessed from Amherst Avenue in the northbound and southbound directions. Westbound traffic on Old Keene Mill Road must continue past the site to the light at Spring Road and do a u-turn, making westbound movements to the facility less than ideal.

Existing Site Easements From the record plat, there are several easements on the existing site. Plat research to determine if any are active will be needed; those not in use will need to be vacated prior to redevelopment. The easements include: VEPCO (Dominion Power), Fairfax County Water Authority (FCWA), Chesapeake And Potomac Telephone Company, and various storm water easements.

Project Goals

The following general points are made to assist in the final design of the facility.

1. Improve regional traffic congestion by redeveloping the existing surface parking lot as a key link in the transportation system.
2. Support the redevelopment of the Springfield Central Business Center (CBC) by leaving street frontage along Old Keene Mill Road for commercial redevelopment to the greatest extent possible.
3. Encourage use of public transportation and car pooling.
4. Provide superior transit station facilities for existing Fairfax Connector and Metro bus routes.
5. Provide superior facility for the existing commuter carpool "slug" pickup operation.
6. Provide increased long-term commuter parking.
7. Provide short-term parking for bus and commuter carpool drop off.
8. Minimize traffic conflicts, particularly along Old Keene Mill Road
9. Provide for future expansion of the long term parking structure.
10. Provide option for a pedestrian bridge across Old Keene Mill Road

Building Program

1. Approximate 1,100 long-term commuter parking spaces with potential for future growth to 1,300 spaces.
2. Short-term parking / drop off for carpool and buses.
3. Minimum 3-bay bus transfer station, and adjacent small store for ticket purchase.
4. Minimum 3 queue positions with space for 4-5 cars each to replace existing carpool drop off and pickup. Space to create additional queue positions is desirable.
5. Sheltered bus station waiting area with windscreens.
6. Sheltered carpool waiting area with windscreens.
7. Weatherproof bicycle storage facility.
8. Capability for adding recreational facilities above parking levels.
9. Optional pedestrian bridge across Old Keene Mill Road.
10. ADA accessibility to all public functions.
11. Free commuter parking capable of being converted to paid-for parking should the County move to that in the future.

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Intermodal Transit Facility Design Criteria

The following criteria should govern the final design of the facility. Additional discussion of parking specifics can be found in Appendix E – Carl Walker Draft Review. Note however that this report discusses preliminary Options 1 & 3, but does not address the Final Options.

Design principles A freestanding parking structure requires thoughtful detailing to offset its utilitarian program. By its nature, the physical structure largely dictates a parking structure's aesthetics, however secondary detailing and the introduction of well-lit pedestrian zones (such as for the bus area, and waiting areas) will contribute much to the look of the facility. The design criteria recommend the use of glass where appropriate at the vertical circulation elements (stairs and elevator cores) to maximize views to and from these important pedestrian areas. This is recommended for aesthetics, to assist in orienting people to the facility's primary areas, and to provide clear, unobstructed views throughout the facility for security purposes.

Criteria for Prioritizing Traffic - The following priority ranking in descending order should be used in planning the facility:

- Pedestrian movement both inside the facility, as well as coming to and from site.
- ADA access should be seamlessly integrated into the overall pedestrian circulation.
- Bicycle commuter traffic, particularly as it approaches and comes onto the site.
- Bus traffic should be given priority over all other vehicular modes.
- Short term commuter traffic.
- Long term commuter parking.

Bus Criteria WMATA's sawtooth bus bay has become a regional standard and is recommended for this facility. The basic bay length is 65 ft. x 8 ft depth, with 25 ft. passing lane. Minimum pedestrian zone should include sufficient room for ADA bus access (8 ft. min.) in addition to movement space for patrons to move between buses and wind shelters. The entire bus transfer area should be located under cover, with wind screens for weather protection for waiting patrons, however air flow is important, so continuous walls should not be employed.

One-way bus traffic is required, preferably with no merge conditions except at the public streets. Given the limited area being considered, it isn't realistic to require that buses can be turned around so that they can exit in the same direction.

Controlled pedestrian crossing within the facility and at the public right of way should be provided. Bus maneuvering must be given high priority when considering the structural bays in this area of the facility, including direction of span, and proximity to obstacles inhibiting driver's vision, as well as obscuring pedestrian vision of the buses.

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Carpool ('slug') Pickup Criteria The current pickup occurs within a surface parking area employing one-way drive aisles. The pickup points are well spaced apart, however a backup at one backs up all three. Moreover, because this occurs within a parking lot, by default anyone accessing the parking spaces is prevented from doing so by backups in the queues.

Based on observed operation of the existing Old Keene Mill Road facility, airport-style drop off lanes located both sides of a central through-lane represents the closest to existing situation. Dedicated queue positions for waiting passengers should be clearly signed. A minimum of 4-5 vehicle spaces per queue should be provided to minimize traffic backing up. Distance from the public way to the first drop off space should be a minimum of 60-75 ft. It is recommended by VDOT that an eastbound turn lane be considered for Old Keene Mill Rd to minimize disruption to the traffic flow. Pickup spaces should be planned at 8 ft. x 25 ft. and the passing lane should be min. 16-20 ft. wide to allow for maneuvering vehicles. The overall planning module should therefore be 32-36 ft wide by 25 ft. long. One way traffic should be maintained through the pickup queues; merge conditions where needed should occur beyond the area of the queues and provided with good sight lines and clear traffic signage.

Pickup employing 45° angle spaces offers an alternative method of carpool 'slug' pickup. Each pickup point would be assigned (and signed) 4-5 spaces, allowing more than one vehicle at a time to pick up commuters from the same queue. Spaces in the range of 13 ft. wide (8 ft. stall plus 5 ft. striped pedestrian zone) would provide additional space for pedestrians to move between vehicles.

Short Term Parking Criteria The 45° angle short term parking scheme illustrated in Figures 2 and 3 can accommodate a larger number of cars than the airport style drop off, while allowing reasonably fast maneuvering. However its chief deficiency is the potential for stalled traffic due to cars backing out of the spaces. In the event, one way traffic in the short term parking area is necessary to help control traffic flow.

Kiss & Ride Criteria The traditional Kiss & Ride layout (shown in Figures 27 and 37) is used by WMATA throughout the region, and is familiar to commuters. It is proposed as means of providing drop off / pick up function for carpools as well as bus commuters. Short term parking spaces at 45 degree angle are located between two one-way lanes. Thus cars do not need to back up into oncoming traffic, speeding up the operation and making it safer for maneuvering. If possible, locating a Kiss & Ride area ahead of the Slug area should help prevent backups onto Old Keene Mill Dr. Design of this area should allow for future reconfiguration as a possible extension of the 'slug' operation. As such, use of raised curbs that restrict reconfiguration (and complicate ADA access) should be held to a minimum.

Parking Structure Criteria - Basic design principles for planning parking structures include the following. These must be weighed against the constraints of site, zoning and budget.

Parking Structure and Bay Size - Establishing the basic parking structure should be based on:

- Structural system (CIP concrete vs. precast concrete vs. steel frame). The most common structural system for parking structures in this region is precast. It is normally the most cost effective vs. cast-in-place (CIP) concrete. Both systems provide good long term life with proper maintenance. However, CIP concrete while being slightly more costly in initial costs does have

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lower life cycle costs. Steel frame systems are normally not used for free standing parking structures. CIP concrete and precast are used together in instances where basement levels require CIP foundation walls.

- For increased longevity of the deck surfaces, the top (weather) deck, and the bus area should have topping slabs. If the budget allows, use of topping slabs throughout may be considered to extend the service life of these surfaces, provided the additional floor to floor height can be accommodated.
- Parking Bay Size - The planning bay used in this study is 30 ft x 60 ft. Floor to floor height used for this study is 10 ft. w/ an assumed 3 ft. structural depth. It is recommended that during final design, several bay sizes be tested against the site constraints. These will vary dependent upon the structural system. Final bay size should consider:
 - parking space size - 9' x 18' is recommended. 8'-6" x 18' is min. per FC PFM and may be considered.
 - drive aisles - 24' wide, with sufficient clearance for turning at end aisles and entrances. (FC PFM min. width = 23').
 - wherever feasible, end bay parking provides best efficiency of layout.
 - clear height for parking areas is 7 ft. minimum, with higher clearances where Metro access and ADA van spaces are designated ((8'-2" minimum). For this reason, ADA van spaces should be located at the Ground Level closest to the bus and commuter pickup points.
- Wider bays (e.g. 36') require either wider or deeper double-T's and main beams for a precast system. Structural depth is should be studied against the 40 ft. zoning height restriction.
- Taller bay height may be considered, however this implies either burying the 'ground' level to the same degree which may not be possible.

Basement Structure –Consideration for the heavier bus traffic load must be taken into consideration, either by decreasing the structural bay spans or deepening the structure and increasing the structural capacity of the deck adding reinforcement or post tensioning the structure to minimize the floor-to-floor height.

One method that should be studied is to build the basement using cast-in-place concrete, with post-tensioned structure, to help keep the floor-to-floor height similar to above. For the parking bay beneath the bus area, reducing the parking to one side of the drive aisle would reduce the structural span from 60 ft. to 42-44 ft. However, to offset the loss in parking, use of the full L-shaped footprint of the Ground Fl above may be necessary.

Vertical Circulation - Egress stairs should be located to encourage their use instead of elevators. As such they should be strategically located to bring people to the pedestrian zones at the ground level at the

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short term parking and bus areas. Ease of circulation should be given priority. Six in twelve riser heights are preferred for this reason. Stairs should be a minimum of 48 to 60 inches wide for comfortable circulation. Protection from weather using glass facades is also recommended. Elevators should be minimum sized at 4,000-4,500 lb. capacity. Machine-less room (MLR) traction elevators should be provided, being the most energy efficient elevators for mid-rise use on the market. Cab interiors, doors and frames should be stainless steel for best life. Cab flooring should be durable and easily cleaned.

The pedestrian bridge 'landing' at the facility should serve as a primary circulation point for the facility itself. At the ground level, the 'landing' stairs and elevators should deliver people to the carpool / short term parking and bus bay areas. Pedestrian crossings of the bus bays should be clearly marked.

Given the linear configuration of the garage, it is recommended that a second elevator bank be located more central to the garage and to the carpool pickup / bus bay area. In addition to the second elevator bank, convenience stairs should be collocated there. If the pedestrian bridge is dropped from the program, relocating that elevator bank may better serve the entire garage.

Should the County decide to develop a rooftop recreational facility, freight elevator access to that level should be included in the building program.

Facility Security Criteria - To the greatest extent possible, all public areas of the facility should be open and visible. Solid walls contributing to compartmentalization of the facility should be avoided. Stairs and elevators should have sufficient degree of glass to be visible from inside and out. Security systems should be compatible with Fairfax County standards.

Facility Lighting Criteria - Absent other input, WMATA's lighting criteria should be met, at an average 10 foot candles in parking areas. Pedestrian areas should have a minimum of 20 foot candles. A minimum of 30 foot candles at the entry/exit drive lanes during daytime hours should be provided to compensate for transition from bright daylight. All lighting should avoid night sky contamination. Lighting should minimize glare, and preferably be in the color range of natural light. To the greatest extent possible, natural light should be achieved.

Pay To Park Recommendations – The current Fairfax County policy for commuter parking facilities is to offer free parking to encourage carpooling and mass transit use. As currently planned, the facility will be operated with no gates; however it should be designed to allow it to be changed to a pay-to-park facility for the long term parking. As an encouragement for carpooling and bus ridership, the carpool 'slug' pickup and short term parking areas should remain free. Therefore placement of parking gates needs to take the multi use aspects of the facility into consideration.

Pay to park systems could be operated as a gated or un-gated operation. A gated operation can create traffic backups during peak entry periods. Thus, adequate vehicle queuing must be provided within the site. With a gated operation, monthly users could access the facility with a pass card and transient daily parkers would take a ticket and pay on exit for parking at centralized pay-on-foot stations. An un-gated operation would require the use of signage, multi-space parking meters and permits to control assignment and distribution of parking. Use of central multi-space pay & display systems (servicing 20-30 spaces) is commonly available today.

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Parking control systems vary depending on the size and mix of transit use (bus and private vehicles) and, whether there is capability to purchase a combined parking & transit monthly pass. There are many systems available with a variety of features: Assuming the County wants to plan for future installation, more specifics about the system's proposed operation would be required.

The use of clear signage is particularly important for parking control operations if patrons are to find the facility easy to navigate.

Key Site Constraints -

- 40 ft. Zoning average height at building perimeter.
- North-to-south width of existing site.
- Required Zoning setback/transitional screening requirements.
- 5 ft grade drop from proposed entrance on Old Keene Mill Road to entrances on Springfield Boulevard.
- Grade change to adjacent Church property.
- Adjacent Church and residential properties will impose constraints on nighttime lighting of facility (and recreational facility should it be part of the program).
- Limited area outside the facility footprint to provide surface storm water management.

Staff Work Sessions

The Study team met with County staff during the study, working through a series of alternative layouts for each of the four sites under consideration. Milestone submissions are discussed in subsequent sections, **Initial Options**, **Mar '13 Revised Options** and **April '13 Revised Options**

In several working sessions with Springfield District Supervisor and staff, the initial options were narrowed to Options 1 and 3 based on:

- County's current ownership of the Option 1 site.
- Relative shortest time to design and build Option 1.
- Best fit to County's program at least cost is Option 1.
- Capability for future expansion with acquisition of adjacent property is Option 3.

Public Meeting

A public meeting presenting the results of the site investigation was held May 8, '13 with elected official and County staff in attendance. The following comments were made:

- Project funding will be by Fairfax County, Virginia and the Federal government.
- Project completion is targeted for 2017.
- Public concern was expressed regarding the hours of operation, noise and night lighting, particularly for rooftop recreation facility.
- Suggestion was made that an alternative to recreational facilities might be a green roof.

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- Concern for the drop in grade, and potential drainage issues affecting the adjacent church property was expressed. (Site stormwater will be directed to on-site storage facilities. Uncontrolled runoff shouldn't be a problem.)
- Exiting carpool / short term traffic crossing incoming long term traffic was seen as a concern.
- It was asked whether the adjacent property to the east of the site might be a better site for a separate bus operation.
- A traffic study was requested.
- Question of parking fees was asked. County's current policy is for free commuter parking facilities. The structure should allow for future paid parking arrangement.
- Security for the structure will include security cameras, open, unobstructed view of all public space. Fairfax County's security service will patrol the site; Fairfax County police may also patrol the site as needed.
- The existing carpool / commuter lot will of necessity be closed for the one year construction period.
- The design of the facility will be in keeping with the present efforts at revitalization of the Springfield CBC.
- It was stated that the County intended to keep the commuter parking and carpool 'slug' operation at this location and noted that along with the improved bus operations, the facility will be a benefit to the community.

Zoning Analysis

The following illustration shows current zoning in the area of the proposed parking garage. The County's existing site is C-6. The potential future sites discussed in Option 3 are zoned C-5 and C-6 respectively, with the later being used for the expanded parking structure.



Figure 18 - Current Zoning

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Option 1 Site Setbacks and Transitional Screening – For the frontage along Old Keene Mill Road and Springfield Boulevard, the current zoning setback is 40 ft., however in initial discussions with Fairfax County Department of Planning and Zoning, this setback may be reduced in keeping with the desired urban streetscape proposed for Springfield’s revitalization area. In Option 3, with the closing of Springfield Boulevard, a 40’ setback from Amherst Avenue is likely to govern at the eastern property edge, though the setback isn’t likely to have an effect on the garage layout, given the required turning radii for buses entering from southbound Amherst Avenue.

For the church property west of the County’s site, a 35 ft. transitional screening is required; however this may be reduced by inclusion of a 7 ft. high screen wall. The study recommends use of the screen wall and reducing the transitional screening from 35 ft. to 15 ft. Zoning Ordinance 13-304 allows that *“The transitional screening yard width and planting requirements may be reduced as much as two-thirds (2/3) where the developer chooses to construct a seven (7) foot brick or architectural block wall instead of the lesser barrier indicated by the matrix. This wall may be reduced to a height of six (6) feet where the Director deems such a height will satisfy the purpose and intent of this Part.”*

For the residential properties south of the County’s site, a 35 ft. transitional screening is required; however this may be reduced by inclusion of a 7 ft. high screen wall. The study does not recommend reducing the transitional screening on this side of the site.

For the American Legion property south of the County’s site, a 20’ setback is required. The proposed garage is aligned on the site to allow for future expansion described in Option 3, and as such is not parallel to the site’s south property line. Minimum 20 ft. rear yard setback is maintained along the length of the site adjacent to the American Legion property. There is no transitional screening yard requirement against the American Legion property line.

Floor Area Ratio (FAR) should not be a concern because parking garages are explicitly excluded in the Zoning Ordinance definition of floor area.

Site Height Limitation – On this site, a 40 ft. height limit restricts the facility to 5 level structure (parking cars on the roof level). In several of the options, included Option 1 as finally selected, this height restriction requires basement level(s) to meeting the County’s program for long term parking (1,100 spaces). Thus inclusion of a rooftop recreation facility will require a Zoning exception to the 40 ft. height limitation.

Stormwater Management (SWM)

The stormwater facilities should meet both water quality and water quantity requirements by means of underground structures. Due to the limited space outside of the parking structure, the facilities should be planned (and budgeted for) as being integral to the parking structure. Given that the site sits on a drainage divide, it is anticipated that two separate facilities will be required, one for each of two stormwater outfalls. It should also be noted that new SWM regulations are scheduled to be adopted by Fairfax County in January ’14, which are likely to impose more stringent stormwater requirements than

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exist at present. The County seeks to encourage innovative techniques and Low Impact Development features in the final design of the facility to the extent allowed by site constraints and budget.

Cost Summary

Preliminary cost estimates were prepared April 25, 2013 by Downey Scott based on the plans as they were developed. The costs are summarized here.

Option 1:	Base structure	471,434 GSF	461 SF & \$34,006 / space	\$34,753,941
	Roof structure & playfields	86,365 GSF		\$9,026,106
Option 3:	Base structure	541,500 GSF	441 SF & \$34,489 / space	\$42,317,412
	Roof structure & playfields	113,540 GSF		\$11,664,761

Cost and square foot per parking space statistics for this facility are significantly higher than typical parking structures for several reasons, the main one being the bus terminal and short term parking/drop off functions which occupy most of the ground level, as well as the higher assumed cost for the basement level to meet the required County program size for Option 1.

Preliminary Building Code Analysis

In order to develop criteria for evaluating the site options studied, a preliminary building code analysis was done based on IBC 2012 ed. with no amendments. (This code is anticipated to be the governing code adopted by Virginia by the time of Final Design.) The County's project designers will determine how to meet the building code. Requirements for firewalls and setbacks were included in the Study to alert the County to impacts on the project layout and cost, but all building code requirements will be the responsibility of the final designers.

From **TABLE 406.5.4** - Type IIA or Type IIB appear to accommodate the programmed size of the garage. Type IIB is least restrictive for cost of structure and has the following setback requirements:

- $5' \leq X < 10'$ = 1 hr fire rating (requiring fire shutters on openings)
- $10'' \leq X < 30'$ = 0 hr fire rating

TABLE 406.5.4 - OPEN PARKING GARAGES AREA AND HEIGHT

TYPE OF CONSTRUCTION	AREA PER TIER (square feet)	HEIGHT (in tiers)		
		Ramp access	Mechanical access	
			Automatic sprinkler system	
			No	Yes
IA	Unlimited	Unlimited	Unlimited	Unlimited

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IB	Unlimited	12 tiers	12 tiers	18 tiers
IIA	50,000	10 tiers	10 tiers	15 tiers
IIB	50,000	8 tiers	8 tiers	12 tiers
IV	50,000	4 tiers	4 tiers	4 tiers

406.5.5 Area and height increases are allowed for garages as follows:

- Garages with sides open on 3/4 of perimeter are increased by 25% and one level in height.
50,000x1.25 = 62,500 SF
- Garages with sides open on 100% of perimeter are increased by 50% and one level in height.
50,000 x 1.5 = 75,000 SF
- For a side to be considered open under the above provisions the total area of openings along the side shall not be less than 50 percent of the interior area of the side at each tier and such openings shall be equally distributed along the length of the tier.

Open parking garages of Type II construction, with all sides open, shall be unlimited in allowable area where the building height does not exceed 75 feet (22 860 mm).

Fire separation distance. Exterior walls and openings in exterior walls shall comply with Tables [601](#) and [602](#). The distance to an adjacent lot line shall be determined in accordance with Table [602](#) and Section [705](#).

TABLE 601 - FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A ^d	B	A ^d	B	HT	A ^d	B
Primary structural frame ^g (see Section 202)	3 ^a	2 ^a	1	0	1	0	HT	1	0
Bearing walls Exterior ^{f, g}	3	2	1	0	2	2	2	1	0
Interior	3 ^a	2 ^a	1	0	1	0	1/HT	1	0
Nonbearing walls and partitions Exterior	See Table 602								
Nonbearing walls and partitions Interior ^e	0	0	0	0	0	0	See Section 602.4.6	0	0
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0

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Roof construction and associated secondary members (see Section 202)	1 ^{1/2} ^b	1 ^{b,c}	1 ^{b,c}	0 ^c	1 ^{b,c}	0	HT	1 ^{b,c}	0
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TABLE 602 - FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE^{a, e, h}

FIRE SEPARATION DISTANCE = X (feet)	TYPE OF CONSTRUCTION	OCCUPANCY GROUP H^f	OCCUPANCY GROUP F-1, M, S-1^g	OCCUPANCY GROUP A, B, E, F-2, I, R, S-2^g, U^b
X < 5^c	All	3	2	1
5 ≤ X < 10	IA	3	2	1
	Others	2	1	1
10 ≤ X < 30	IA, IB	2	1	1 ^d
	IIB, VB	1	0	0
	Others	1	1	1^d
X ≥ 30	All	0	0	0

705.8.1 Allowable area of openings. The maximum area of unprotected and protected openings permitted in an exterior wall in any story of a building shall not exceed the percentages specified in Table [705.8](#).

TABLE 705.8 - MAXIMUM AREA OF EXTERIOR WALL OPENINGS BASED ON FIRE SEPARATION DISTANCE AND DEGREE OF OPENING PROTECTION

FIRE SEPARATION DISTANCE (feet)	DEGREE OF OPENING PROTECTION	ALLOWABLE AREA^a
0 to less than 3 ^{b, c}	Unprotected, Nonsprinklered (UP, NS)	Not Permitted
	Unprotected, Sprinklered (UP, S) ⁱ	Not Permitted
	Protected (P)	Not Permitted
3 to less than 5 ^{d, e}	Unprotected, Nonsprinklered (UP, NS)	Not Permitted
	Unprotected, Sprinklered (UP, S) ⁱ	15%

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	Protected (P)	15%
5 to less than 10 ^{e, f, j}	Unprotected, Nonsprinklered (UP, NS)	10% ^h
	Unprotected, Sprinklered (UP, S) ⁱ	25%
	Protected (P)	25%
10 to less than 15 ^{e, f, g}	Unprotected, Nonsprinklered (UP, NS)	15% ^h
	Unprotected, Sprinklered (UP, S) ⁱ	45%
	Protected (P)	45%
15 to less than 20 ^{f, g}	Unprotected, Nonsprinklered (UP, NS)	25%
	Unprotected, Sprinklered (UP, S) ⁱ	75%
	Protected (P)	75%
20 to less than 25 ^{f, g}	Unprotected, Nonsprinklered (UP, NS)	45%
	Unprotected, Sprinklered (UP, S) ⁱ	No Limit
	Protected (P)	No Limit
25 to less than 30 ^{f, g}	Unprotected, Nonsprinklered (UP, NS)	70%
	Unprotected, Sprinklered (UP, S) ⁱ	No Limit
	Protected (P)	No Limit
30 or greater	Unprotected, Nonsprinklered (UP, NS)	No Limit
	Unprotected, Sprinklered (UP, S) ⁱ	Not Required
	Protected (P)	Not Required

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Fire Truck Access

Fairfax County Public Facilities Manual includes the following:

“9-0202.2.J(2) When buildings are more than five stories or 50 feet in height, ladder truck access shall be provided to both the front and rear of the building.”

“9-0202.2J(3) The access to the rear may be provided by either a street, parking lot, or fire lane.”

Under the recommended Option 1 scheme, the parking structure does not exceed 50 ft. unless the recreational facility is added. Assuming the roof deck recreational facility can be funded as part of the project, during final design this issue should be investigated early in the project with Fairfax Fire Marshal's office to determine whether access from the adjacent properties or other alternative means (including use of sprinklers) can satisfy this requirement. The site's east-west dimension is such that the loss of a parking bay to create this fire lane would make use of a parking ramp impossible. Unless relief from the restriction could be agreed to, this Study does not recommend exceeding the 5 story / 50 ft. height limit.

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III. Initial Options

The Study focused on 5 site-based scenarios (or options). Various alternative layouts were studied for each of the site scenarios, developing the building program by further defining how each element is intended to function on the site. At the end of this section, a matrix comparison of the initial options is included. The layouts were based on initial zoning assumptions as shown below. The final zoning setback assumptions are described in **Zoning Analysis**.



Figure 19 - Initial Zoning Assumptions

Option 1 - Existing County Site



Figure 20 – Image by Google Earth

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Three initial layouts were studied for the County's existing site. The ground level plans are included here for reference, and the full layouts are included in Appendix B.

Option 1 (presented 2/15/13) establishes a basic linear garage with the parking ramp running east-west on the site. This provides 2+ parking bays sufficient for an parking ramp system. A secondary part of the garage runs parallel to the property line at the NW corner of the site, and is at a skew to the main part of the garage. The secondary part is 2 bays wide, and is turned so that the long span is perpendicular to the direction of traffic at ground floor, allowing the greatest flexibility in layout.

The ground level layout consists of: 3 bus bays, 8 carpool 'slug' pickup spaces, and the entrance level for the long term parking spaces. Buses enter from Springfield Blvd and exit onto eastbound Old Keene Mill Road. Reversing the direction of bus movements would restrict access to eastbound Old Keene Mill Road, and is not recommended. Carpool pickup traffic enters and exits from eastbound Old Keene Mill Road; it also exits onto Springfield Blvd via the long term parking area. Long term parking enters and exits from both Old Keene Mill Road and Springfield Boulevard. Exiting slug traffic must merge with the exiting buses inside the garage in order to reach Old Keene Mill Road

The carpool 'slug' pickup operation employs an airport-style drop off both sides of a center drive aisle, which is closest to the current pickup operation. Each drop off zone can accommodate 4 vehicles at a time, which anecdotally is less than the current 3 drop off zones available. Upper long term parking levels are accessed via parking ramp. Speed ramps are not possible given the constricted land area without significantly reducing the total number of spaces available within the current site's zoning envelope. A total of 1,150 long term spaces on 6 levels is shown. A similar number can be achieved within the 40 ft. height limit if a basement level is added.

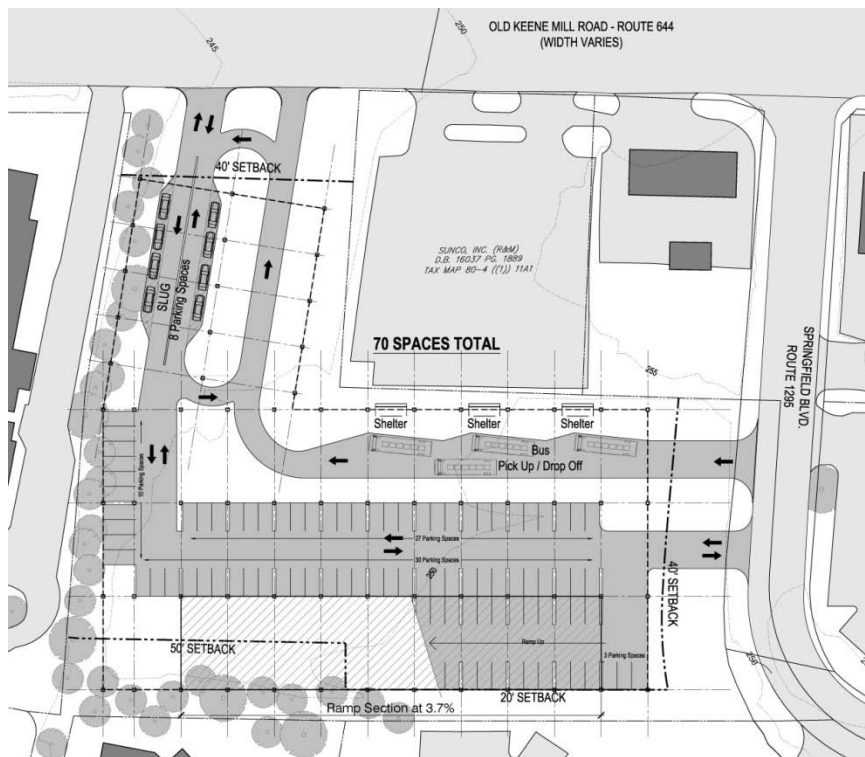


Figure 21 - Initial Option 1

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Option 1a (presented 2/15/13) changes the basic orientation of the garage by employing a completely orthogonal geometry. The same linear garage with the ramps running east-west is used, but the secondary area is kept at ninety degrees to the basic area.

The ground level layout consists of: 3 bus bays, 24 carpool 'slug' pickup spaces, and the entrance level for the long term parking. Buses enter from Springfield Boulevard and exit onto eastbound Old Keene Mill Road. Carpool pickup traffic enters and exits from eastbound Old Keene Mill Road; it also exits onto Springfield Blvd via the long term parking area. Exiting slug traffic is kept separate from the exiting bus traffic. Long term parking enters and exits via Springfield Boulevard and secondarily to and from eastbound Old Keene Mill Road.

The short term parking layout employs a combination layout of drop off and short term parking. While the layout offers improved short term parking, questions were raised as to whether its use for the established carpool pickup operation was ideal. The carpool pickup operation is further discussed in Recommended Options.

Upper long term parking levels are accessed via parking ramp similar to Option 1. A total of 1,113 long term spaces on 6 levels is shown. A similar number can be achieved within the 40 ft. height limit provided a basement level is added.

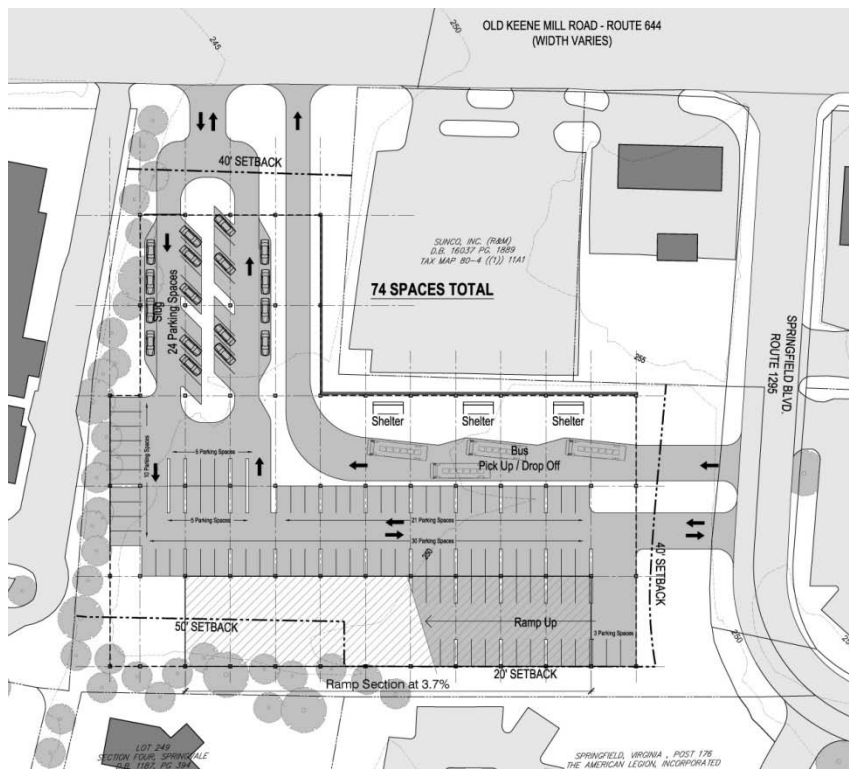


Figure 22 Initial Option 1a

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Option 1b (presented 2/15/13) is similar to Option 1a, except that a 50 ft. setback is observed from the adjacent residential property to the SW of the site. The ground level configuration matches Option 1a with the exception that fewer long term spaces are possible with the bite taken for the zoning setback. The short term parking area extends partially beyond the cover of the parking structure.

Upper long term parking levels are accessed via parking ramp similar to Option 1 above. A total of 1,137 long term spaces on 7 levels is shown. A similar number can be achieved within the 40 ft. height limit provided 2 basement levels are added.



Figure 23 - Initial Option 1b

Conclusions - Option 1 was later refined to a single layout by dropping the angled section of garage, and adjusting to 35 ft. transitional screening to the residential property. The Option 1a ground level layout was favored, as concern for merging buses and cars inside the garage was expressed.

Bus Access to the Site

Bus access is complicated by the street circulation patterns in this area of Springfield. Once arriving at the site, the physical maneuverability of the vehicles makes direct access from Old Keene Mill Road difficult (read expensive due to the required turning radii). It also limits bus access from one direction (namely eastbound Old Keene Mill Rd) whereas entering from Springfield Blvd provides access from multiple directions. Buses entering from Old Keene Mill Road also complicate the short term parking entrance, and may create too much congestion on an already congested arterial. It would also put the exiting bus traffic adjacent to the exiting long term parking. Ultimately VDOT weighed in by recommending consolidating entry/exit points to the greatest extent possible.

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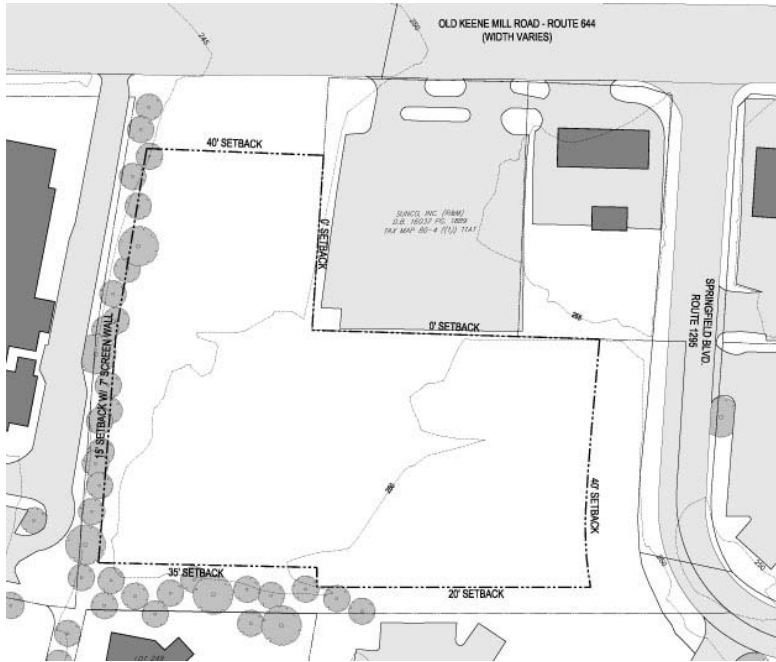


Figure 24 - Revised Zoning Assumptions

Option 2

Existing County site plus existing Sunoco gas station site. For this site option, three initial layouts were studied including the option to incorporate a commercial gas station which became Option 5. Option 2 was later refined, with both ground floor layouts being carried forward during the study. The ground level plans are included here for reference, and the full layouts are included in Appendix A.



Figure 25 - Image by Google Earth

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Option 2 (presented 2/15/13) - expands the basic linear garage to five full parking bays, with the ramps running east-west on the site. This option allows for more than one internal parking ramp.

The ground level layout consists of: 3 bus bays, 20 carpool 'slug' pickup spaces, and the entrance level for the long term parking spaces. Buses enter from Springfield Blvd and exit onto eastbound Old Keene Mill Road. Carpool pickup traffic enters and exits from eastbound Old Keene Mill Road and Springfield Boulevard. Long term parking enters and exits from both Old Keene Mill Road and Springfield Boulevard

Carpool pickup parking employs an airport-style drop off both sides of a center drive aisle; this layout has two-way traffic in the short term parking area. The 4 pickup queues can accommodate 5 vehicles in each queue, which exceeds the current 3 pickup queues available.

Upper long term parking levels are accessed via parking ramp. Speed ramps are not recommended given the constricted land area. Given the longer ramp length, cross aisles for circulation at the mid points of the ramps are shown. A total of 1,183 long term spaces on 5 levels can be achieved within the 40 ft. height limit.

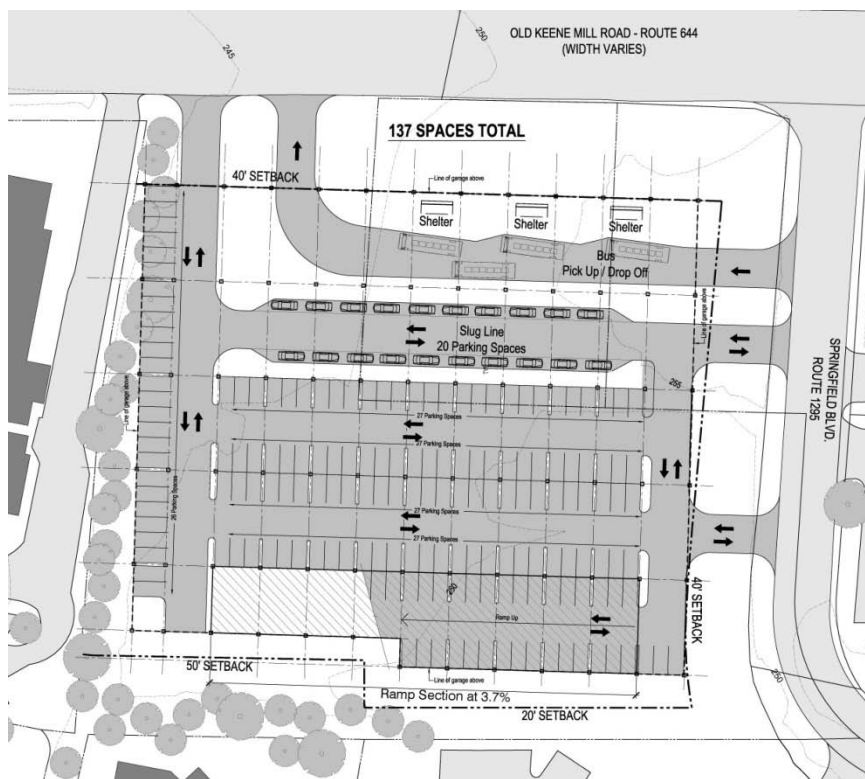


Figure 26 - Initial Option 2

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Option 2a (presented 2/15/13) – also employs five full parking bays, with the ramps running east-west on the site. This option includes two internal parking ramps to improve internal circulation on the long term parking levels.

The ground level layout consists of: 6 bus bays, 18 carpool ‘slug’ pickup spaces, and the entrance level for the long term parking spaces. Buses enter and exit from eastbound Old Keene Mill Road as well as Springfield Blvd in a two-way configuration. Carpool pickup traffic enters and exits from eastbound Old Keene Mill Road and Springfield Boulevard. Long term parking enters and exits from both Old Keene Mill Road and Springfield Boulevard.

Short term parking employs a Metro-style kiss & ride layout with an extended pickup area which can accommodate the current 3 pickup queues. The pickup area is adjacent to the pedestrian island for the buses.

Upper long term parking levels are accessed via two internal parking ramps for better garage circulation. Speed ramps are not recommended given the constricted land area. Given the longer ramp length, cross aisles for circulation at the mid points of the ramps are shown. A total of 1,173 long term spaces on 5 levels can be achieved within the 40 ft. height limit.



Figure 27 - Initial Option 2a

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Option 2b (presented 2/15/13) – also employs five full parking bays, with the ramps running east-west on the site. This option allows for more than one internal parking ramp.

The ground level layout consists of: 4 bus bays, 36 carpool ‘slug’ pickup spaces, and the entrance level for the long term parking spaces. Buses enter from Springfield Blvd and exit onto eastbound Old Keene Mill Road, merging with exiting short term and long term parking. Slug traffic enters and exits from eastbound Old Keene Mill Road and Springfield Boulevard. Long term parking enters and exits from both Old Keene Mill Road and Springfield Boulevard.

The first full bay of the structure is reserved for a gas station / convenience store operation, replacing the existing Sunoco station. The station has two-way traffic and is accessible from both Old Keene Mill Rd and Springfield Boulevard

The short term parking area employs a 2-way 45° angled parking layout with a pickup area which can accommodate the current 3 pickup queues. The pickup area is adjacent to the pedestrian island for the buses.

Upper long term parking levels are accessed via parking ramp. Speed ramps are not recommended given the constricted land area. Given the longer ramp length, cross aisles for circulation at the mid points of the ramps are shown. A total of 1,051 long term spaces on 5 levels can be achieved within the 40 ft. height limit.

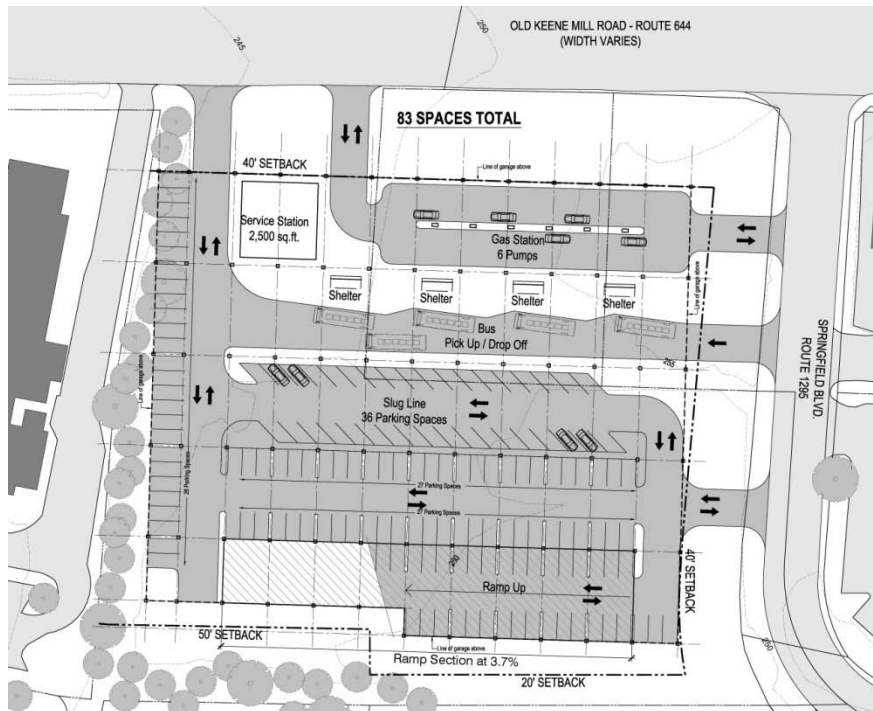


Figure 28 - Initial Option 2b

Springfield CBC Commuter Parking Garage Study

Option 2 Conclusions – This option offers the least restrictive site area of all options studied, however given that the Sunoco facility is actively being redeveloped by Sunoco, it was deemed least likely to be obtained by the County. Of the three options shown, Option 2 and Option 2a were modified in regard to the short term parking and bus areas; Option 2b became Option 5.

Option 3

Existing County site plus two sites on east side of Springfield Boulevard. For this site option, two initial layouts were studied, occupying the entirety of the adjacent properties. The ground level plans are included here for reference, and the full layouts are included in Appendix A. The initial layouts were later refined to improve the garage layout by removing the northern site from the garage, but employing it for an access road from Old Keene Mill Road



Figure 29 - Image by Google Earth

Option 3 (presented 2/15/13) employs a basic linear garage with the ramps running east-west on the site. This provides 2+ parking bays sufficient for an internal parking ramp system. Two secondary areas of the garage occupy the NW and SE ends of the site, both extending to Old Keene Mill Road. The structural bays for these secondary areas are oriented in the same direction as the main area in this option.

The ground level layout consists of: 4 bus bays, 24 carpool 'slug' pickup spaces, and the entrance level for the long term parking spaces. Buses enter and exit from eastbound Old Keene Mill Road and Springfield Boulevard. Carpool pickup traffic enters and exits from eastbound Old Keene Mill Road; it also exits onto Springfield Blvd via the long term parking area. Long term parking enters and exits from both Old Keene Mill Road and Springfield Boulevard. Exiting carpool pickup traffic does not merge with the exiting buses.

The short term parking layout (similar to that in Option 1a) employs a combination layout of drop off and short term parking. While the layout offers better short term parking, questions were raised as to whether its use for the established slug operation was ideal. The carpool 'slug' operation is further discussed in Recommended Options.

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Upper long term parking levels are accessed via parking ramp. Speed ramps are not possible given the constricted land area without significantly reducing the total number of spaces available within the current site's zoning envelope. A total of 1,404 long term spaces on 5 levels can be achieved within the 40 ft. height limit, greatly exceeding the County's program and subsequently costing more. Given the grade change against the Veterans (Amherst Street) Bridge, a retaining wall along the east elevation for the first several stories would likely be required.



Figure 30 - Initial Option 3

Option 3a (presented 2/15/13) is similar in most respects to Option 3. The principal difference is that Option 3a studies the effect of the 50 ft. setback from the residential property at the SW corner of the site. A total of 1,244 long term spaces on 5 levels can be achieved within the assumed Zoning setbacks.

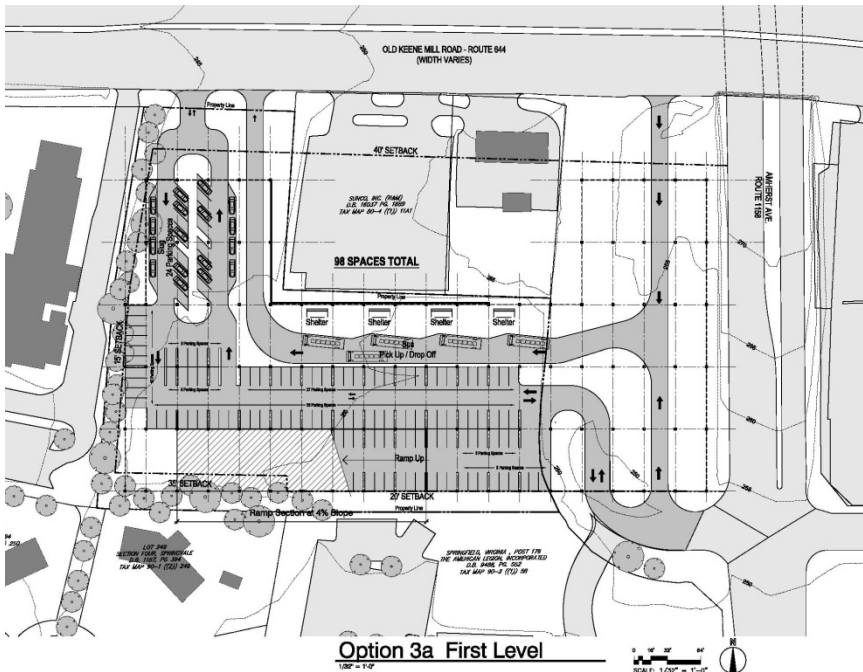


Figure 31 - Initial Option 3a - 3rd - 5th Fls.

Springfield CBC Commuter Parking Garage Study

Option 3 Conclusions – The northern most part of the adjacent property facing Old Keene Mill Road does not seem to benefit the overall layout and can only be laid out inefficiently. As such it is left undeveloped in later versions.

Because the increased site area exceeds the County's program for long term parking, logically it costs more. The land acquisition to the east of the County's site offers increased length to the parking ramp, but otherwise is difficult to use effectively at the ground level, given the requirement for maneuvering buses and segregating bus and car traffic.

Option 4

Existing County site plus majority of the existing American Legion parking lot. For this site option, one initial layout was studied. This is included in Appendix A. From an internal garage circulation standpoint this option scored poorly. It also was one of the least efficient layouts, including difficult entry / exit function.



Figure 32 - Image by Google Earth

Option 4 (presented 2/15/13) employs a basic linear garage with the ramps running east-west on the site. This provides 2+ parking bays sufficient for an internal parking ramp system. Two secondary areas of the garage occupy the NW and SE ends of the site. The structural bays for these secondary areas are oriented in the same direction as the main area in this option. Parking ramp is located internal to the garage, allowing for circulation to the SE area of the garage.

The ground level layout consists of: 3 bus bays, 28 carpool 'slug' pickup spaces, and the entrance level for the long term parking spaces. Buses enter from Springfield Boulevard and exit to eastbound Old Keene Mill Road. Carpool pickup traffic enters and exits from eastbound Old Keene Mill Road; given the ramp location the short term and the long term parking areas are not interconnected. Long term parking users enter and exit from Springfield Boulevard. Exiting slug traffic does not merge with the exiting buses.

Springfield CBC Commuter Parking Garage Study

The short term parking layout (similar to that in Option 1a) employs a combination layout of drop off and short term parking. While the layout offers better short term parking, questions were raised as to whether its use for the established slug operation was ideal. The carpool pickup operation is further discussed in Recommended Options.

Upper long term parking levels are accessed via a parking ramp. Speed ramps are not possible given the constricted land area without significantly reducing the total number of spaces available within the current site's zoning envelope. A total of 1,124 long term spaces on 7 levels is shown. A similar number can be achieved within the 40 ft. height limit if a basement level is added.

Option 4 does allow for a 50 ft. setback from the residential property at the SW corner of the site. It is the 'bite' taken from the layout that makes this layout inefficient.

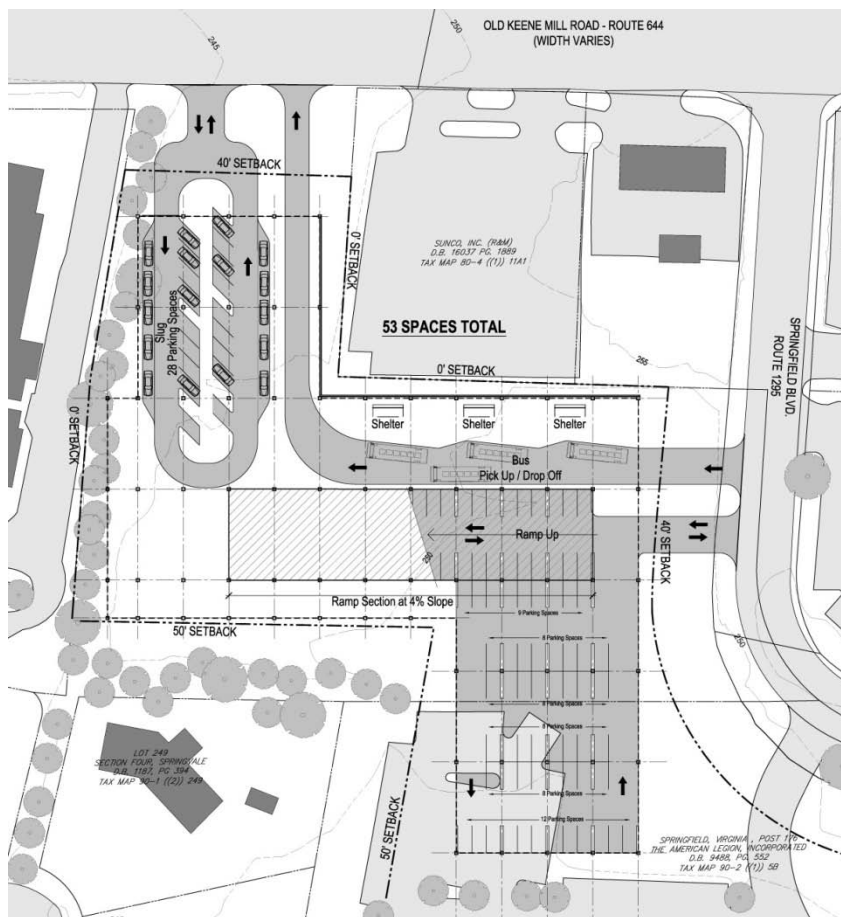


Figure 33 - Initial Opt. 4

Option 4 Conclusions – The acquisition of a portion of the American Legion property does not greatly benefit the project. There is insufficient distance to turn the basic ramp direction, and moreover the bus function works best in the direction shown, however as configured, the two 'wings' are inefficient and difficult to navigate. Basement levels are required, and overall the long term parking layout is inefficient.

IV. March, '13 Revised Options



Figure 34 - Revised Zoning Setbacks

From the initial Zoning analysis, further study revealed key changes that were used to improve the site options. Along the west side adjacent to the church property, it is proposed that 15 ft. setback and 7 ft. tall screen wall be employed; without the screen wall, the full 2 bays would need to be reduced, making this part of the garage much more inefficient, and the ground level nearly impossible to work. For the residential property at the SW corner, a 35 ft. landscape screen is minimum required.

Revised Option 1

Option 1 (presented 3/8/13) included the following changes:

- Option 1 lengthens the carpool 'slug' pickup operation and improves the merge with exiting buses.
- Bus bays are increased to 5 total.

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- Layout adjusts the overall placement of the facility to account for the 15 ft setback from the church (w/ 7 ft. screen wall) at the west side and 35 ft setback from the residential property at the SW corner of the site.
- Long term parking entrances from Springfield Blvd are studied to increase number of entry/exit lanes.
- Two partial basement levels are added to lower the height above grade to 40 ft.
- Elevator core is located at NW corner to receive optional pedestrian bridge (at 3rd Level) across Old Keene Mill Road
- 3-D model showing facility w/out recreation level is created in preparation for public meeting(s).
- A total of 1,154 long term spaces on 5 above-grade levels + 2 basement levels are shown.

Option 1a and Option 1b were dropped from discussion.

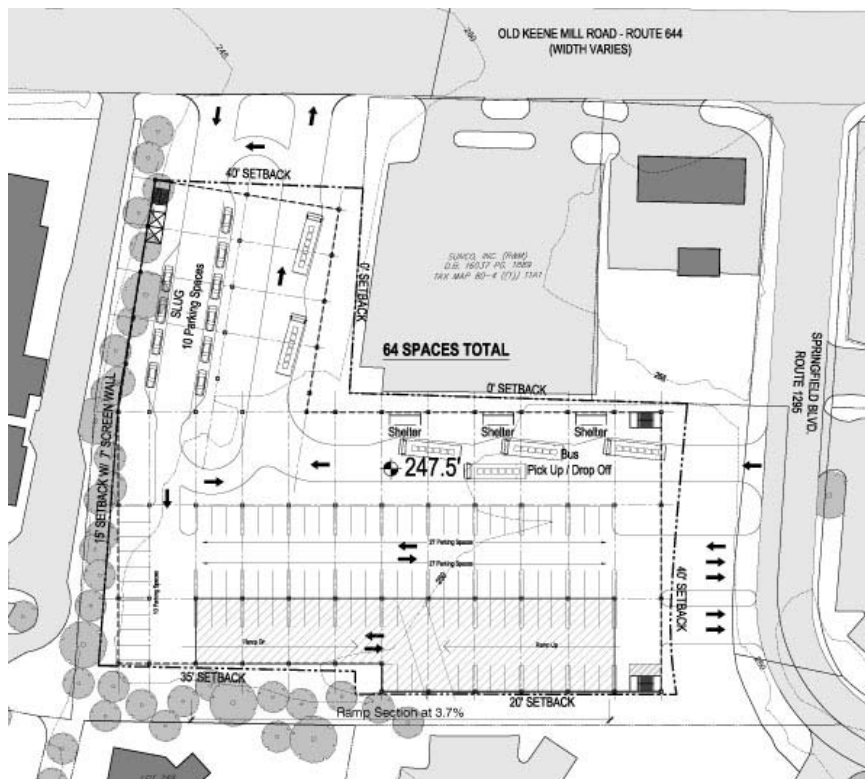


Figure 35 - Revised Option 1

Revised Option 2

Option 2 (Presented 3/8/13) included the following changes:

- The layout adjusts the overall placement of the facility to account for the 15 ft setback from the church at the west side and 35 ft setback from the residential property at the SW corner of the site. Note: notch in garage at SW corner is eliminated.
- Carpool 'slug' pickup / bus exit to Old Keene Mill Road is combined on site; exiting cars stop for buses.
- Entrances from Springfield Blvd are studied to increase number of entry/exit lanes.

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- Elevator core is located at front of facility facing Old Keene Mill Road to receive optional pedestrian bridge (at 3rd Level) across Old Keene Mill Road
- 3-D model showing facility w/out recreation level is created in preparation for public meeting(s).
- A total of 1,153 long term spaces on 5 above-grade levels are shown.

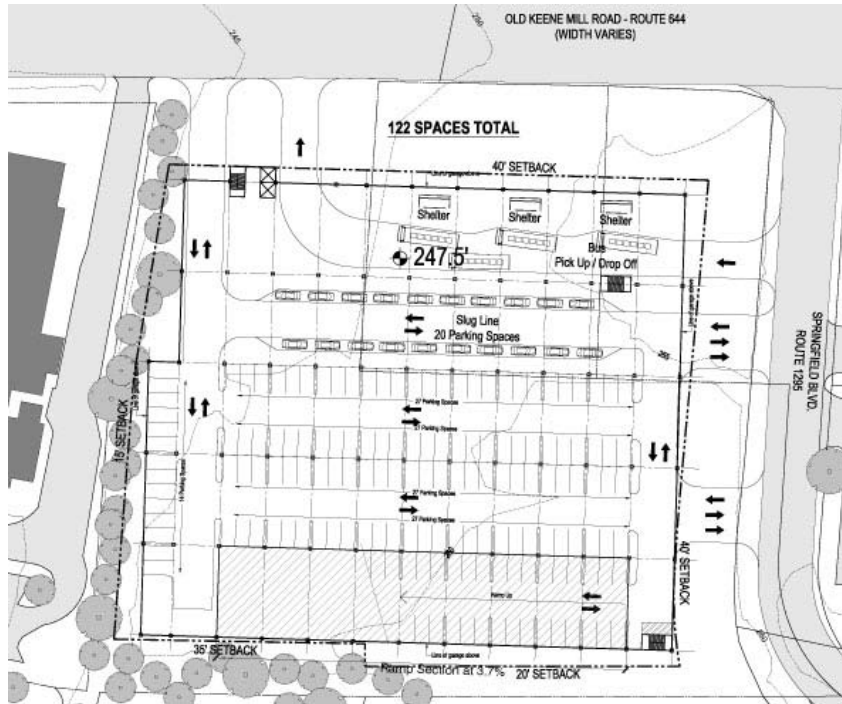


Figure 36 - Revised Option 2

Option 2a (Presented 3/8/13) included the following changes:

- The layout adjusts the overall placement of the facility to account for the 15 ft setback from the church at the west side and 35 ft setback from the residential property at the SW corner of the site. Note: notch in garage at SW corner is eliminated.
- Two-way bus traffic is eliminated; 4 bus bays are provided (down from 6).
- Short term and long term entrances from Springfield Blvd is studied to increase number of entry/exit lanes.
- Elevator core is located in NW section of garage to receive optional pedestrian bridge (at 3rd Level) across Old Keene Mill Road
- Exit from long term parking to Old Keene Mill Road is eliminated.
- 3-D model showing facility w/out recreation level is created in preparation for public meeting(s).
- A total of 1,153 long term spaces on 5 above-grade levels are shown.

Springfield CBC Commuter Parking Garage Study

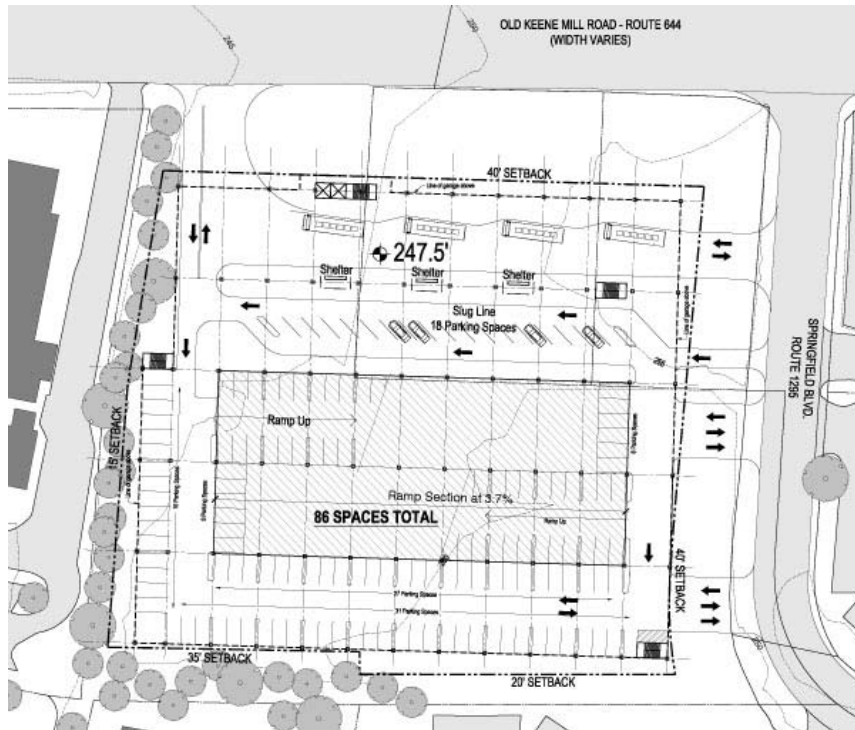


Figure 37 - Revised Option 2a

Option 2b This site option has same land area as in Option 2 and studies incorporating a commercial gas station facing Old Keene Mill Road. Initially developed as Option 2b, it was later renamed to Option 5 for clarity. See comments to follow re. Option 5.

Revised Option 3

Option 3 (Presented 3/8/13) included the following changes:

- The layout adjusts the overall placement of the facility to account for the 15 ft setback from the church at the west side and 35 ft setback from the residential property at the SW corner of the site. Note: notch in SW corner improved by use of angled parking in this area.
- Structure is pulled back out of the northern-most adjacent site to improve layout efficiency. Bus entrance drive from Old Keene Mill Road is kept as in previous iteration.
- Short term and long term entrances from Springfield Blvd studied to increase number of entry/exit lanes.
- Elevator core is located in NW section of garage to receive optional pedestrian bridge (at 3rd Level) across Old Keene Mill Road
- Parking ramps are moved to interior bay to allow access to full garage from Old Keene Mill Road
- 3-D model showing facility w/out recreation level is created in preparation for public meeting(s).
- A total of 1,227 long term spaces on 5 above-grade levels are shown.

Springfield CBC Commuter Parking Garage Study

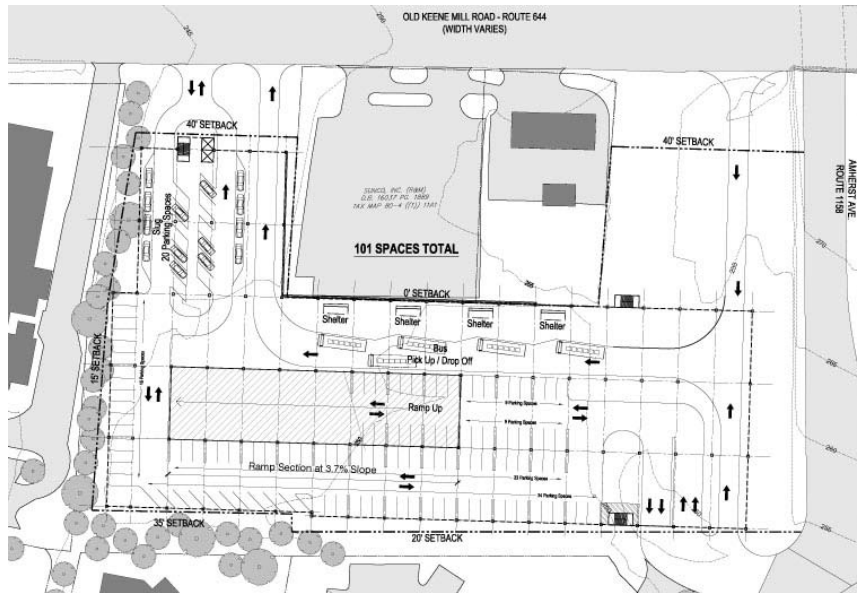


Figure 38 - Revised Option 3

Option 3a was dropped from further consideration.

Revised Option 4

Option 4 (Presented 3/8/13) included the following changes:

- The layout adjusts the overall placement of the facility to account for the 15 ft setback from the church at the west side and 35 ft setback from the residential property at the SW corner of the site. Note: the SE area was increased by 1 bay as a result, and the main area was improved by use of angled parking in the area of the SW 'notch'.
- Second entrance to long term parking area from Springfield Blvd increases number of entry/exit lanes.
- Elevator core is located in NW section of garage to receive optional pedestrian bridge (at 3rd Level) across Old Keene Mill Road
- 3-D model showing facility w/out recreation level created in preparation for public meeting(s).
- A total of 1,253 long term spaces on 5 above-grade levels plus 1 basement level are shown.

Option 4 Conclusions - This option was dropped due to its awkward offset shape, creating a difficult layout for a parking structure. Long term value of the American Legion property would be reduced (and likewise its redevelopment potential). The land take would leave the property with reduced area, a less desirable entrance and require use of the County's parking structure for large events.

Springfield CBC Commuter Parking Garage Study

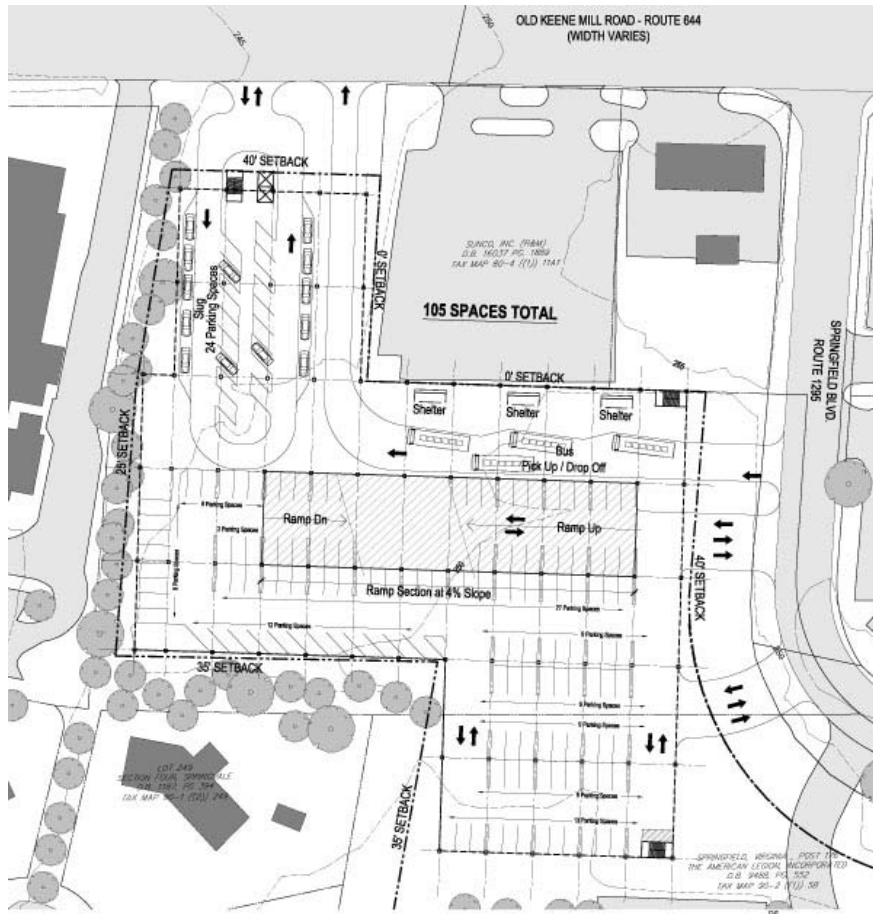


Figure 39 - Revised Option 4

Option 5 (previous Option 2b)

Option 5 (Presented 3/8/13)

This site option has same land area as in Option 2 and studies incorporating a commercial gas station facing Old Keene Mill Road. Initially developed as Option 2b, it was later renamed to Option 5 for clarity. The ground level plans are included here for reference, and the full layouts are included in Appendix A.

Changes included since Option 2b include:

- The layout adjusts the overall placement of the facility to account for the 15 ft setback from the church at the west side and 35 ft setback from the residential property at the SW corner of the site.
- Commercial gas station circulation changes from 2-way to 1-way, entering from Springfield Boulevard and exiting onto eastbound Old Keene Mill Road
- Second entrance to long term parking area from Springfield Blvd increases number of entry/exit lanes. Parking ramp aligns with the second entrance.
- Elevator core is located at front of facility facing Old Keene Mill Road to receive optional pedestrian bridge (at 3rd Level) across Old Keene Mill Road

Springfield CBC Commuter Parking Garage Study

- 3-D model showing facility w/out recreation level created in preparation for public meeting(s).
- A total of 1,408 long term spaces on 5 above-grade levels are shown.

Option 5 Conclusions - This option was dropped due to cost, relative complexities of a joint development, and the disinterest of Sunoco to sell the property. Since the existing site can achieve the County's program requirements, the cost and added time involved in obtaining this site was deemed unnecessary to the success of the project.

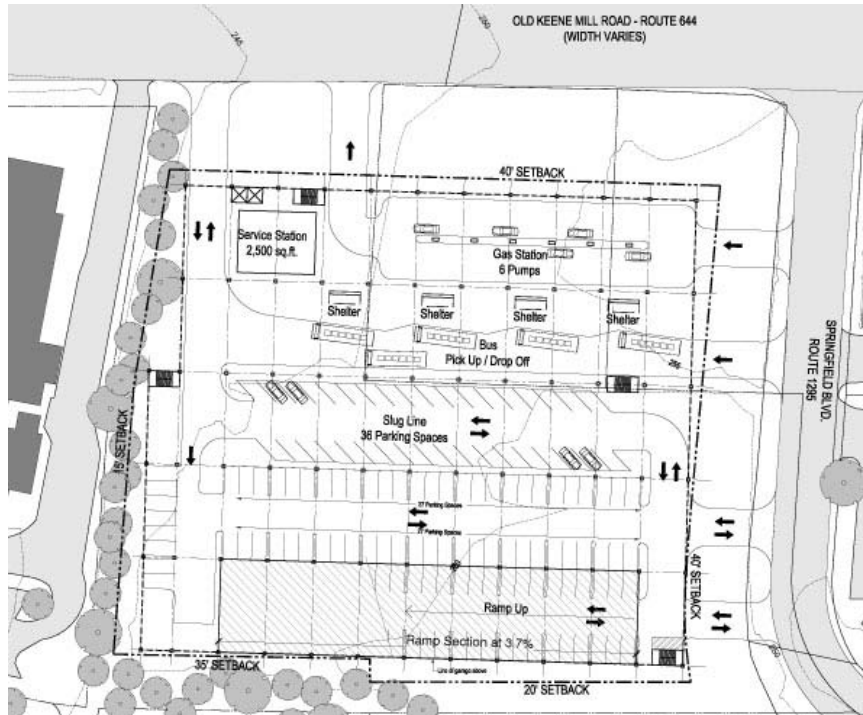


Figure 40 - Revised Option 5

Evaluation Criteria

The following criteria were used to evaluate the initial options:

- Meets program for long-term parking spaces?
- Number of bus bays?
- Number of slug transfer spaces?
- Good carpool (slug) pickup operation?
- Requires basement to stay w/in 40 ft. zoning height?
- Requires 7 ft. screen wall against Church property?
- Separate bus entrance provided?
- Buses are required to exit w/ slug traffic?
- Bridge over Old Keene Mill is feasible?
- Efficient / self-directed parking garage circulation?
- Requires firewall against Sunoco gas station property?
- ADA parking spaces on 2nd Fl. w/out requiring additional elevator?
- Closes Springfield Boulevard?
- Potential for rooftop recreation field?
- 12 pump gas station & 2,500 SF store on ground level.
- Requires 2-hr. firewall between gas station and rest of facility?

Springfield CBC Commuter Parking Garage Study

The following matrix analyzes the initial options. Options 2, 2a and 5 were dropped when it was determined by the County that Sunoco Inc., the property Owner was not interested in selling the gas station property. Option 4 was dropped as having a less desirable layout. Option 1 and Option 3 were carried forward, studying ways to improve the “slug” operation, as well as entrances/exits to the facility.

Springfield Parking Garage Study Initial Options Comparison

Characteristics	Option 1	Option 2	Option 3	Option 4	Option 5
# of Parking Spaces	1,154	1,153	1,227	1,253	1,214
# of Bus Bays	5	4	4	3	5
# of Slug transfer spaces	10	18	20	24	36
Building SF (not including playing level)	461,175 SF	470,195 SF	467,605 SF	506,752 SF	497,463 SF
Construction Cost - garage only	\$34,995,425	\$26,462,135	\$26,560,405	\$34,290,501	\$29,284,960
Construction Cost - playing fields	\$9,706,250	\$12,735,625	\$13,620,625	\$11,936,250	\$12,819,500
Additional Land Acquisition Costs	None	\$5.0 M	\$3.7 M	TBD	TBD
TBD = To be determined					
Slug transfer operation	Slow	Best	Good	Good	Good
Requires basement to stay w/in 40 ft. zoning height?	1-2 basement levels	No	No	Small basement level	Small basement level
Separate bus entrance?	Yes	Yes	Yes	Yes	Yes
Buses exit w/ slug vehicles?	Yes	Yes	No	No	Yes
Bridge over Old Keene Mill at 3rd level?	Yes	Yes	Yes	Yes	Yes
Good parking garage layout?	acceptable	best	good	poor	best
Good parking entry/exit operations?	difficult	best	acceptable?	difficult	acceptable
Requires 1-2 hr. firewall against gas station property lines	Yes	No	Yes	Yes	No
Closes Springfield Blvd?	No	No	Yes	No	No
Potential for playing field on roof	120'x350' *	300'x350'	120'x530' *	120'x350' **	300'x350'
* with 120'x120' side section	tennis /		tennis /	tennis /	
** with 120'x120' and 120'x150' side sections	basketball courts	3/4 size soccer & track	basketball courts	basketball courts	3/4 size soccer & track
12 pump gas station & 2,500 SF store on ground level	No	No	No	No	Yes
Requires 2-hr. fire wall between gas station	No	No	No	No	Yes

Springfield CBC Commuter Parking Garage Study

V. April, '13 Revised Options

Revised Option 1

Option 1 (presented 4/25/13) included the following changes:

- Exiting bus traffic separated from short term parking.
- Short term parking entrance remains from eastbound Old Keene Mill Rd; secondary exit from short term is combined with long term parking to Springfield Boulevard
- Carpool 'slug' pickup area is reconfigured to combine airport-style drop off area (20 spaces) with secondary Kiss & Ride style drop off (18 spaces). Carpool pickup and short term parking area is extended to wrap around the bus bays. This reduces long term parking count for the Ground Level.
- The 40 ft. setback from Old Keene Mill Road and from Springfield Boulevard called for by the County's Comprehensive Plan is superseded by Springfield CBC redevelopment plans bringing buildings to street edge to create an urban street edge. NW area of structure is brought to street edge at Old Keene Mill Road and main garage length is increased by a 30 ft. bay to take advantage of this.
- Elevator core is shifted to middle of NW area facing Old Keene Mill Road
- Basement level long term parking access is provided through the short term parking area, however it cannot be reached from Springfield Boulevard given the one-way short term parking layout.
- Based on VDOT review of the initial plans, Old Keene Mill Rd entrances were changed to single entrance / exit and at Springfield Boulevard exits were reduced to two locations.
- 3-D model is updated to reflect revisions, and additional perspectives are provided.
- A total of 1,022 long term spaces on 5 above-grade levels + 1 basement level are shown.
- Optional recreational area is shown for rooftop.

Springfield CBC Commuter Parking Garage Study

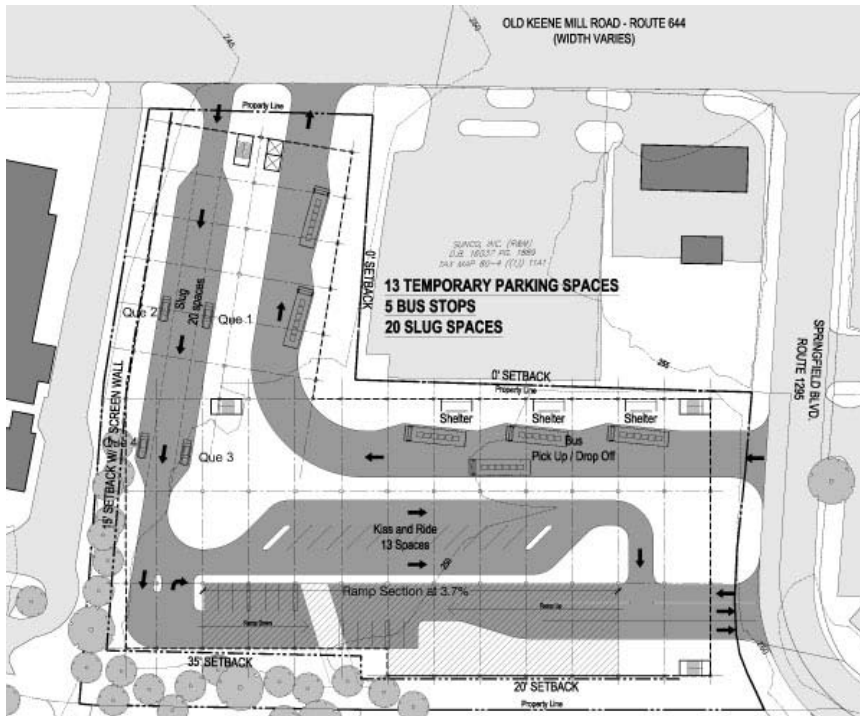


Figure 41 - Revised Option 1

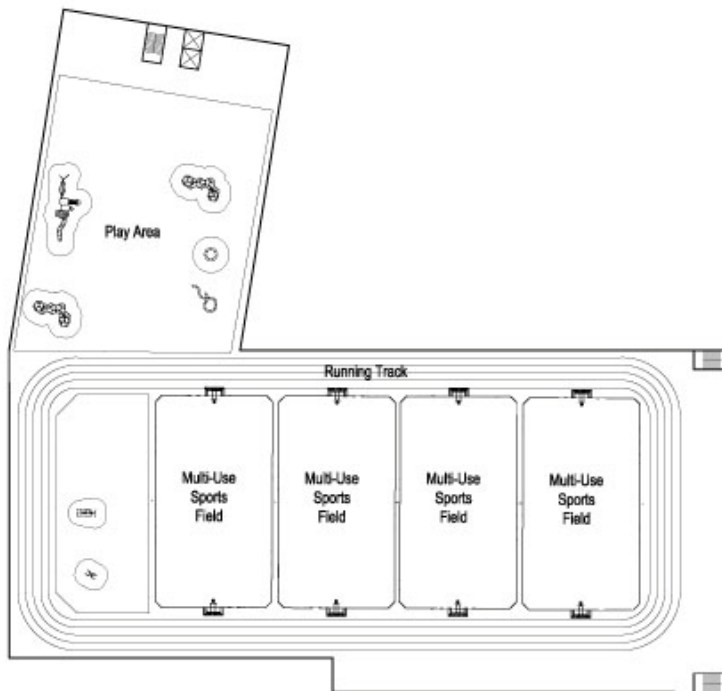


Figure 42 - Revised Option 1 Rooftop

Springfield CBC Commuter Parking Garage Study

Revised Option 3

Option 3 (presented 4/25/13) included the following changes:

- Garage orientation is realigned to match Option 1, creating ability to use Option 3 as a future development, with Option 1 being the first phase work.
- Leg of Springfield Boulevard is replaced by bus access drive from Old Keene Mill Rd. Access drive shall also provide means for tanker trucks to exit the adjacent Sunoco gas station site.
- Carpool 'slug' pickup area adopts the Option 1 layout, using combine airport-style drop off area (20 spaces) with secondary Kiss & Ride style drop off (13 spaces).
- Carpool 'slug' pickup area is provided an exit merging w/ buses to eastbound Old Keene Mill Road
- Entry / exit to long term parking is aligned with Springfield Ave / Amherst Ave intersection.
- Long term parking entrance is reconfigured to provide multiple entry/exit lanes to offset limitation of a single entrance point.
- The 40 ft. setback from Old Keene Mill Road and from Springfield Boulevard called for by the County's Comprehensive Plan is superseded by Springfield CBC redevelopment plans bringing buildings to street edge to create an urban street edge. NW area of structure is brought to street edge at Old Keene Mill Road and main garage length is increased by a 30 ft. bay to take advantage of this.
- Elevator core is shifted to middle of NW area facing Old Keene Mill Road.
- Basement level long term parking access is provided through the short term parking area, however it cannot be reached from Springfield Boulevard given the one-way short term parking layout. Exit from basement is via Kiss & Ride area to Springfield Boulevard and eastbound Old Keene Mill Road.
- Based on VDOT review of the initial plans, Old Keene Mill Rd entrances were changed to single entrance / exit and at Springfield Boulevard exits were reduced to two locations.
- As a result of the increased lanes to and from Springfield Boulevard a minor land take and reconfiguration of the adjacent American Legion entrance is recommended.
- 3-D model is updated to reflect revisions, and additional perspectives are provided.
- Basement level for long term parking is held at Option 1 length, however if needed, this basement can be expanded matching the Option 3 footprint.
- A total of 1,277 long term spaces on 5 above-grade levels + 1 basement level are shown.
- Optional rooftop recreational area is shown.

Springfield CBC Commuter Parking Garage Study

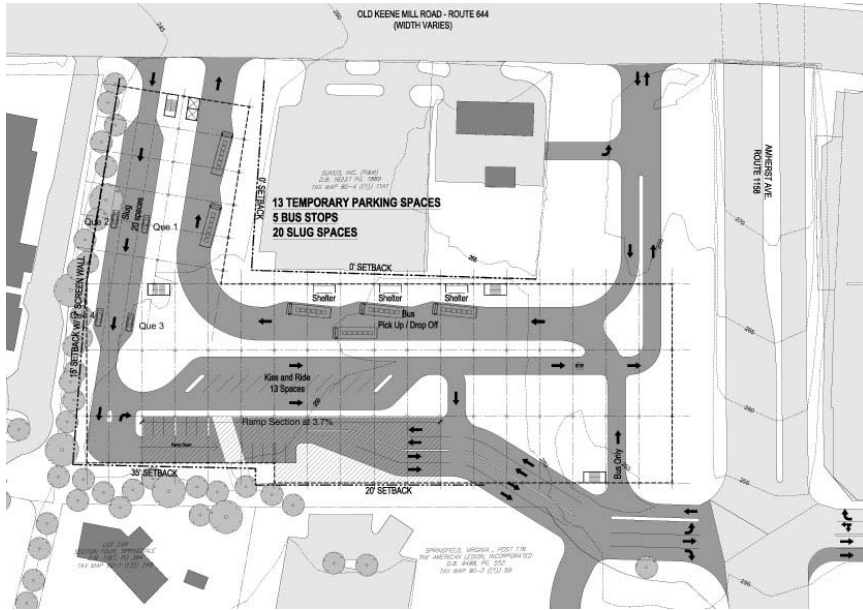


Figure 43 - Revised Option 3

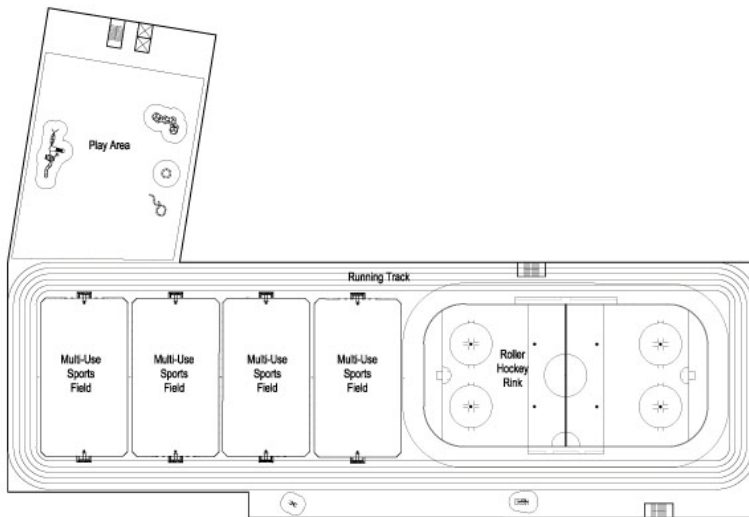
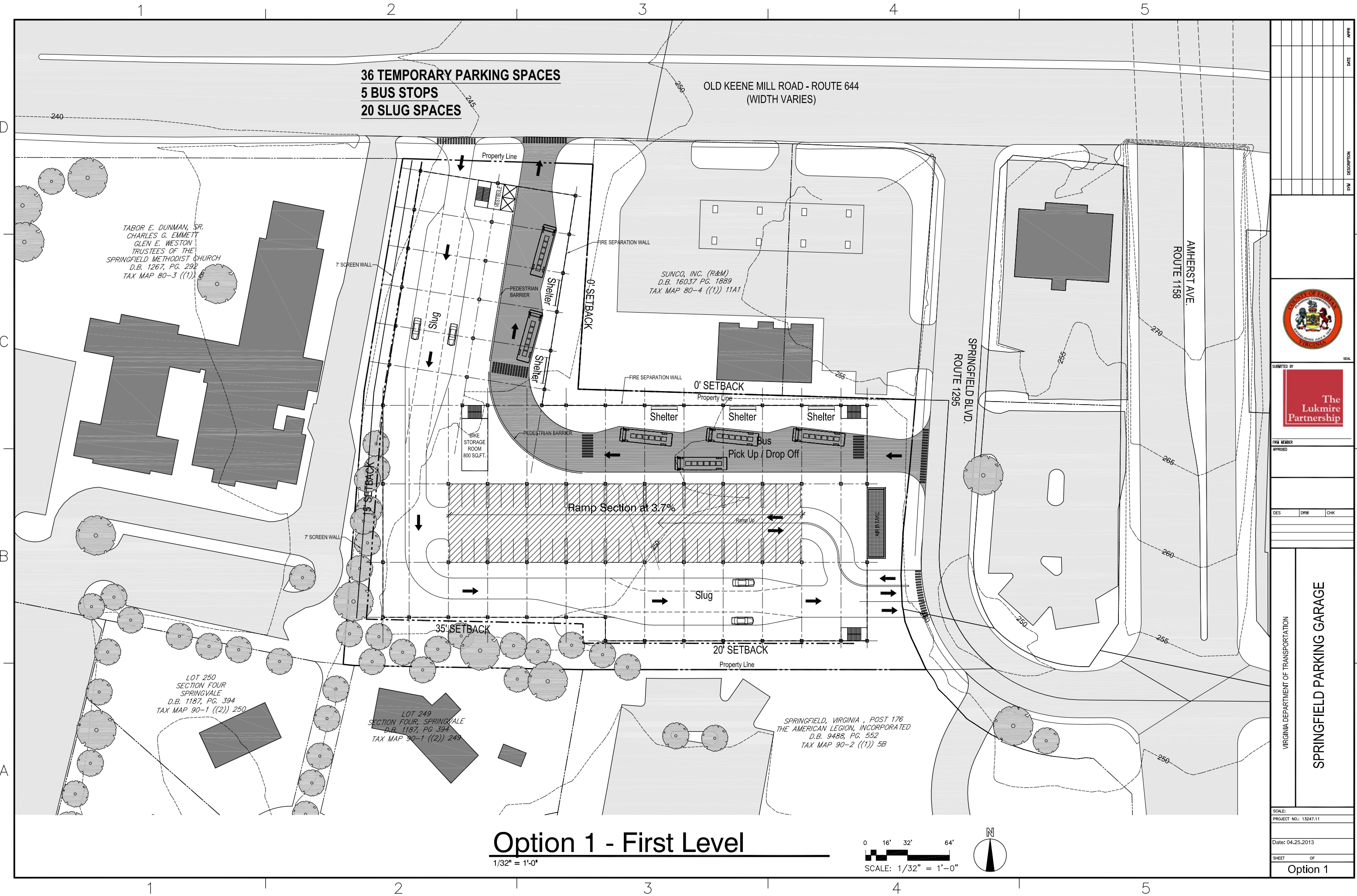


Figure 44 - Revised Option 3 Rooftop

Appendix A – Half-Size Plans & Elevations for Recommended Option 1



36 TEMPORARY PARKING SPACES
5 BUS STOPS
20 SLUG SPACES

OLD KEENE MILL ROAD - ROUTE 644
(WIDTH VARIES)

TABOR E. DUNMAN, SR.
CHARLES G. EMMETT
GLEN E. WESTON
TRUSTEES OF THE
SPRINGFIELD METHODIST CHURCH
D.B. 1267, PG. 292
TAX MAP 80-3 ((1))

SUNCO, INC. (R&M)
D.B. 16037 PG. 1889
TAX MAP 80-4 ((1)) 11A1

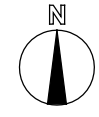
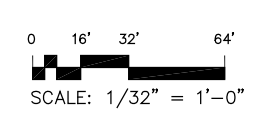
LOT 250
SECTION FOUR
SPRINGVALE
D.B. 1187, PG. 394
TAX MAP 90-1 ((2)) 250



LOT 249
SECTION FOUR, SPRINGVALE
D.B. 1187, PG. 394
TAX MAP 90-1 ((2)) 249

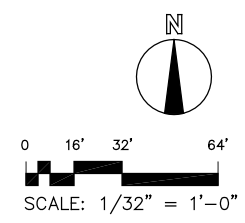
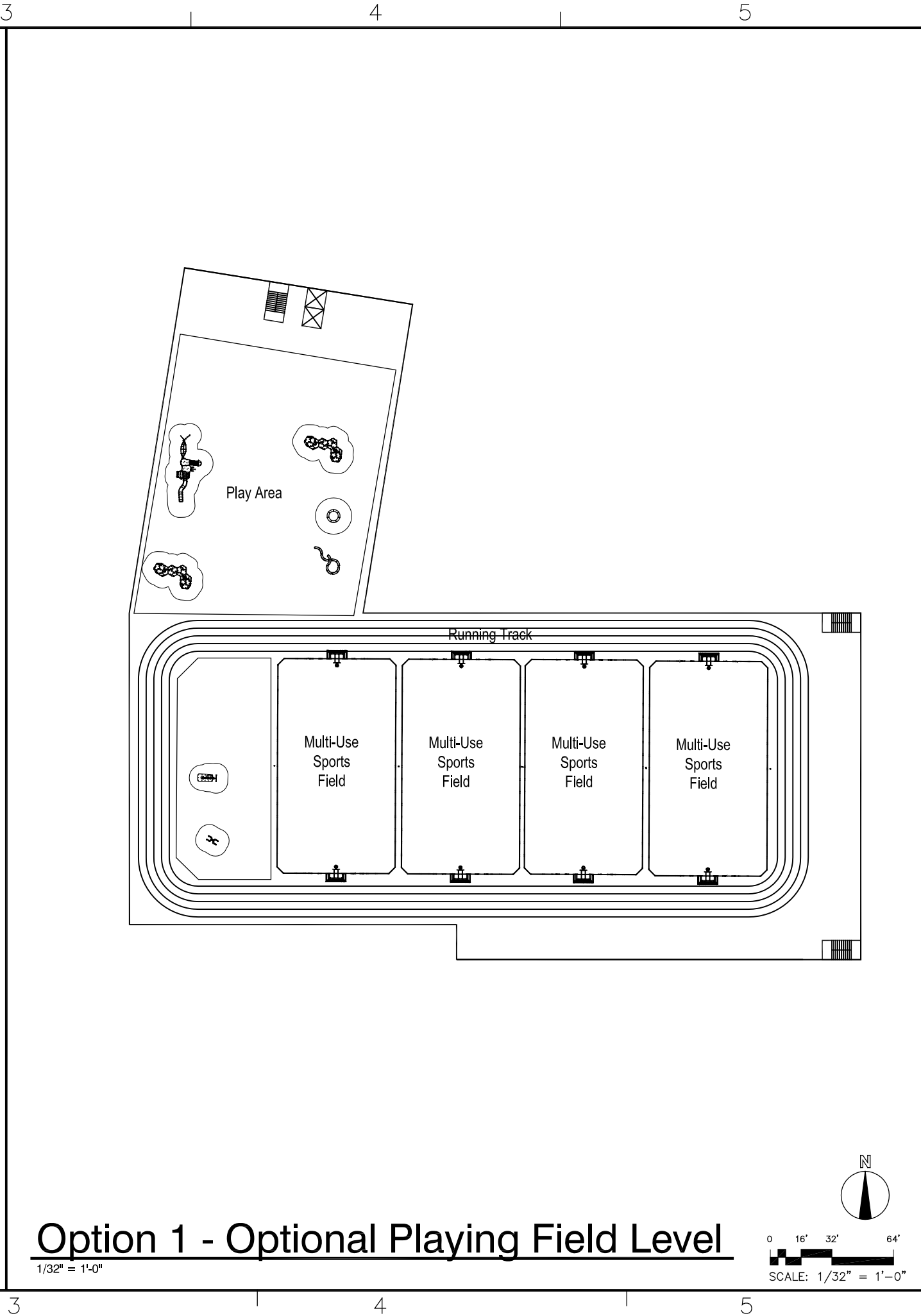
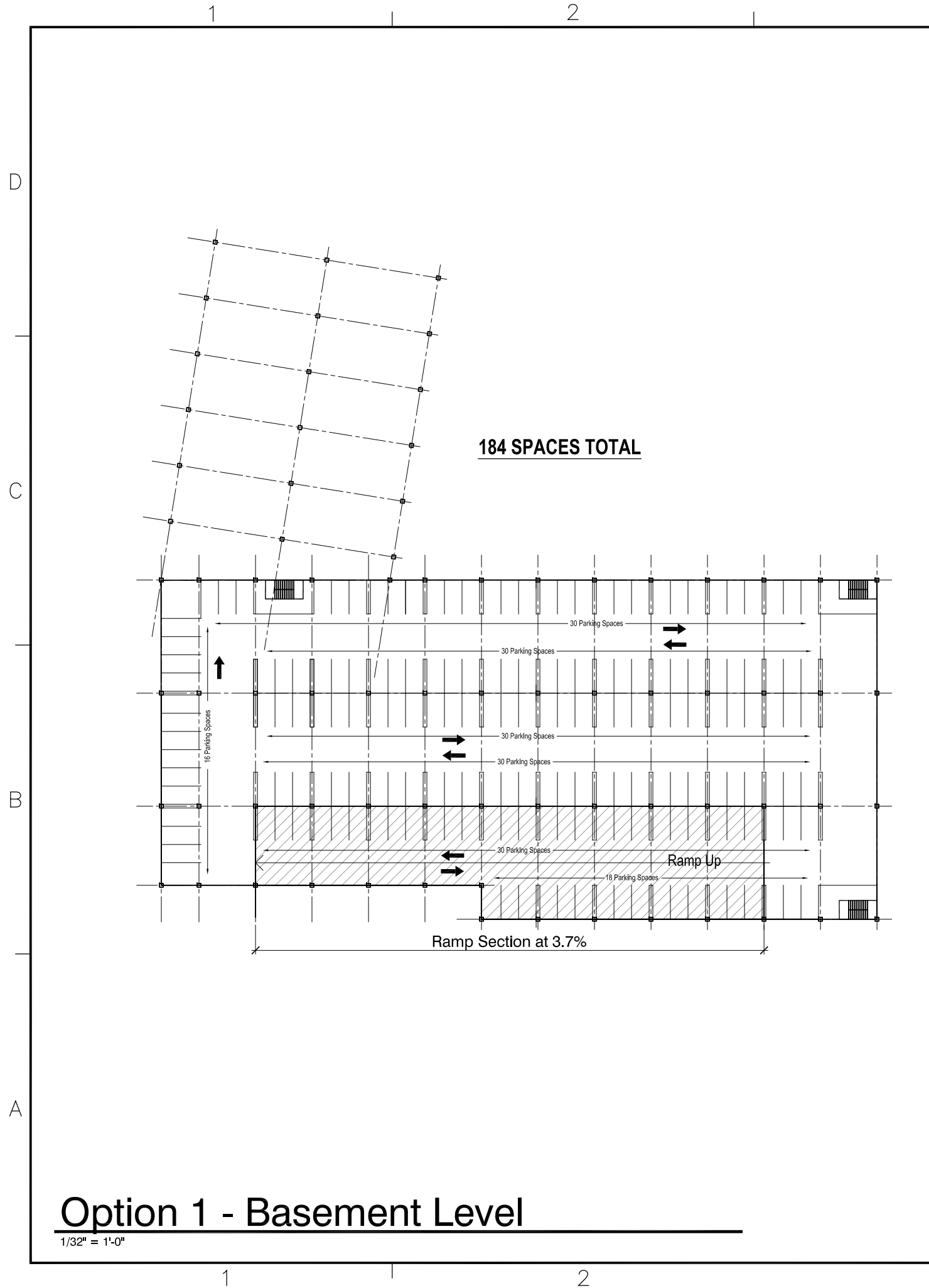
SPRINGFIELD, VIRGINIA, POST 176
THE AMERICAN LEGION, INCORPORATED
D.B. 9488, PG. 552
TAX MAP 90-2 ((1)) 5B

Option 1 - First Level

1/32" = 1'-0"



	DATE	APPR
	SEAL	C
SUBMITTED BY		
		
FIRM MEMBER		
APPROVED		
DES DRW CHK		
VIRGINIA DEPARTMENT OF TRANSPORTATION SPRINGFIELD PARKING GARAGE		
SCALE:		
PROJECT NO: 13247.11		
Date: 04.25.2013		
SHEET OF		
Option 1		



APPR	
DATE	
DESCRIPTION	
SN	

SUBMITTED BY: **The Lukmire Partnership**

FROM MEMBER APPROVED

DES: _____ DRW: _____ CHK: _____

VIRGINIA DEPARTMENT OF TRANSPORTATION

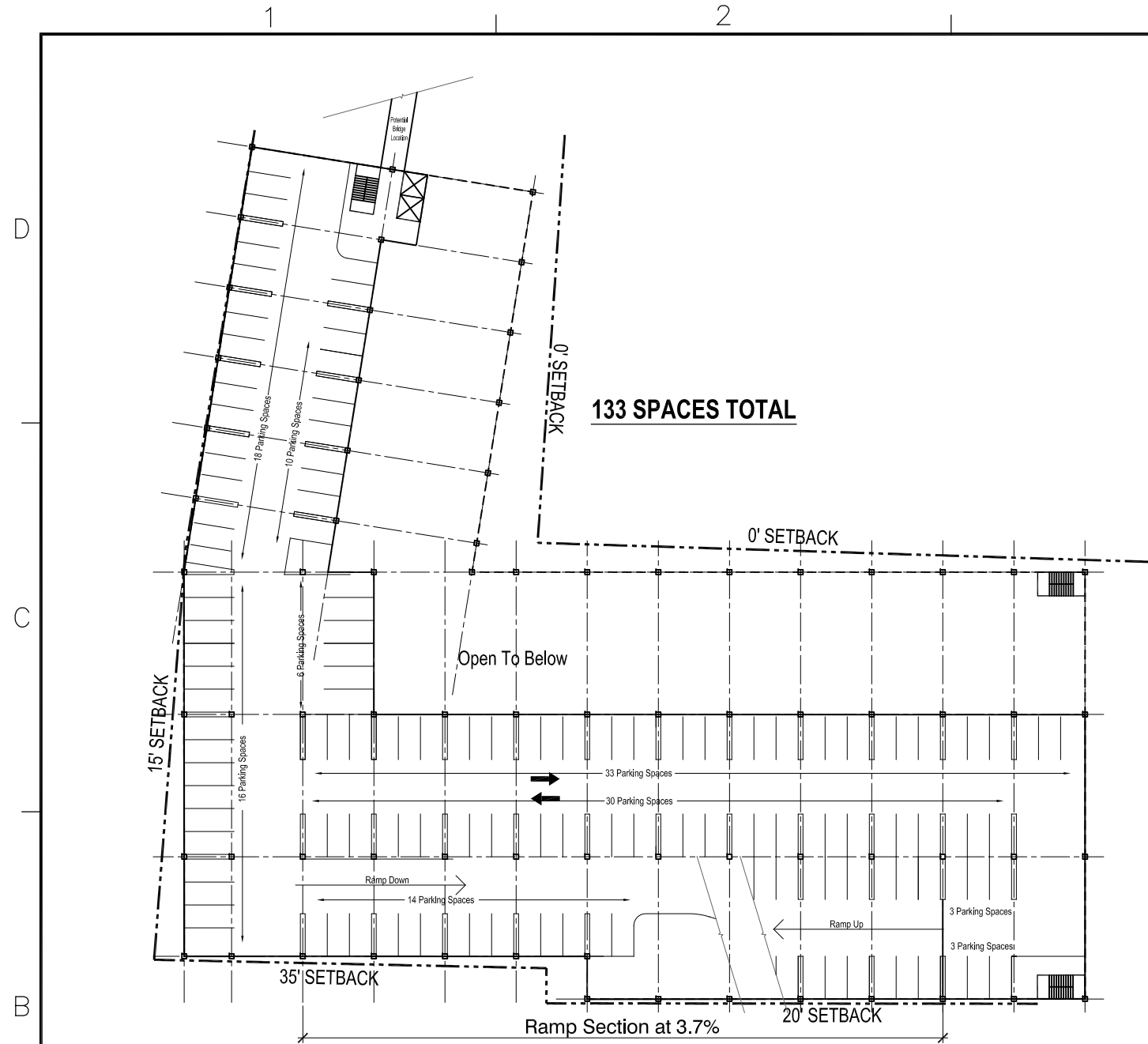
SPRINGFIELD PARKING GARAGE

SCALE: PROJECT NO.: 13247.11

Date: 04.25.2013

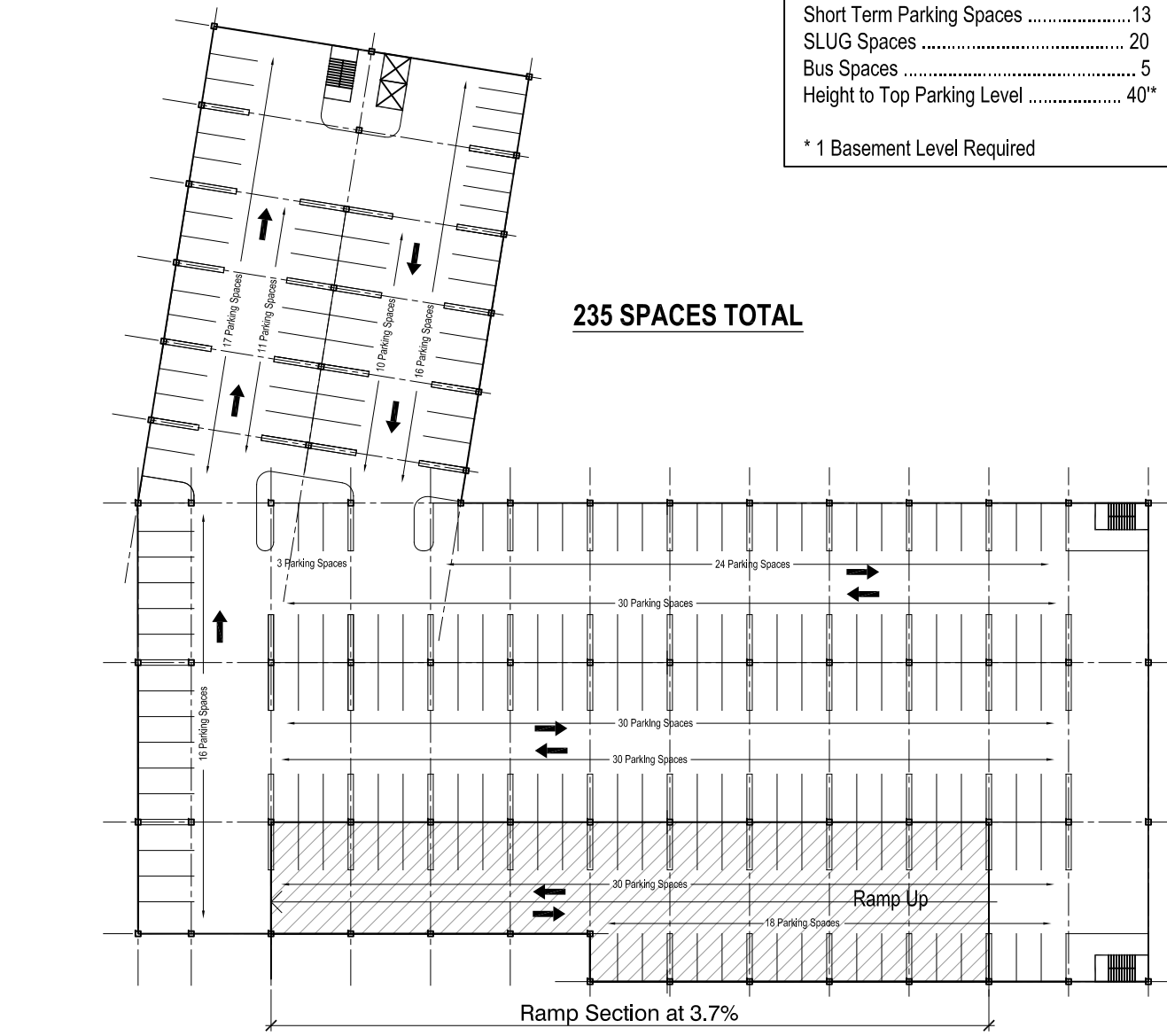
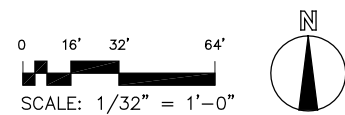
SHEET OF

Option 1



Option 1 - Second Level

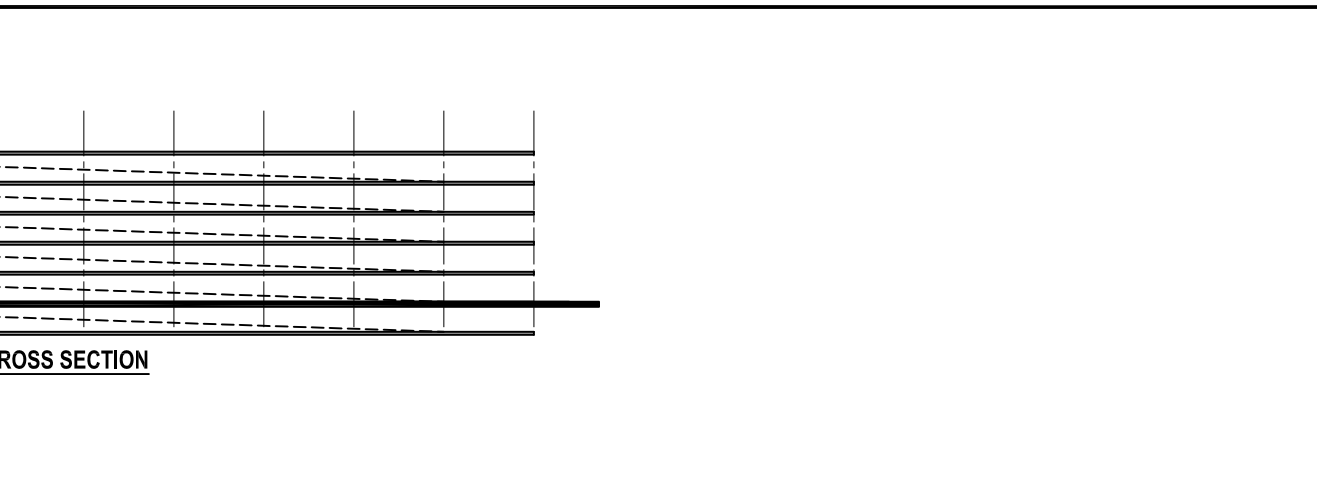
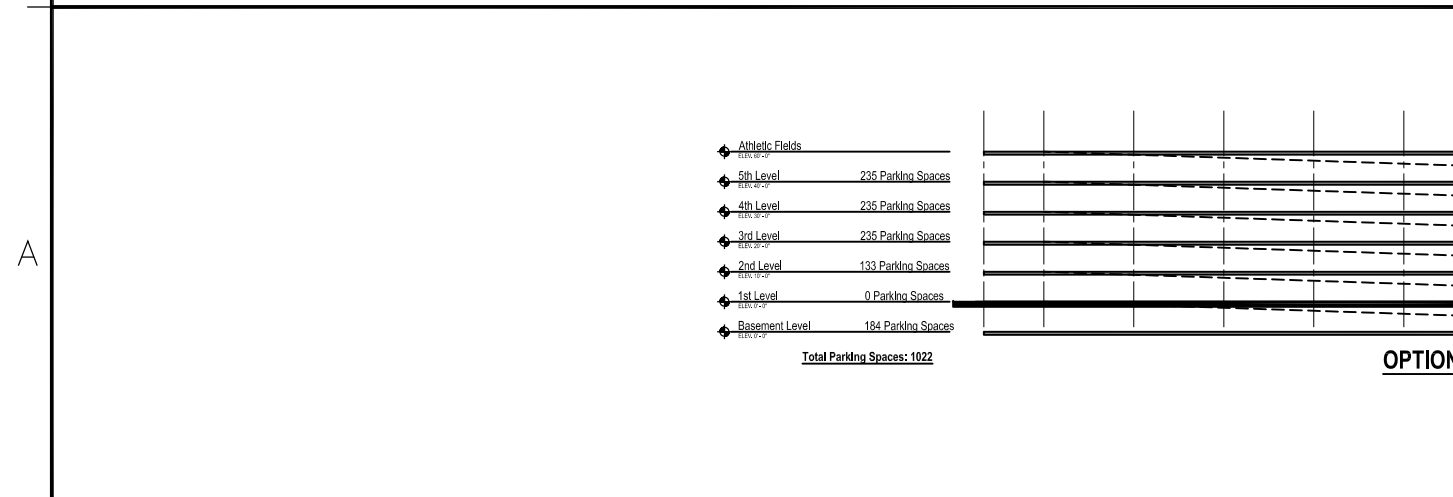
1/32" = 1'-0"





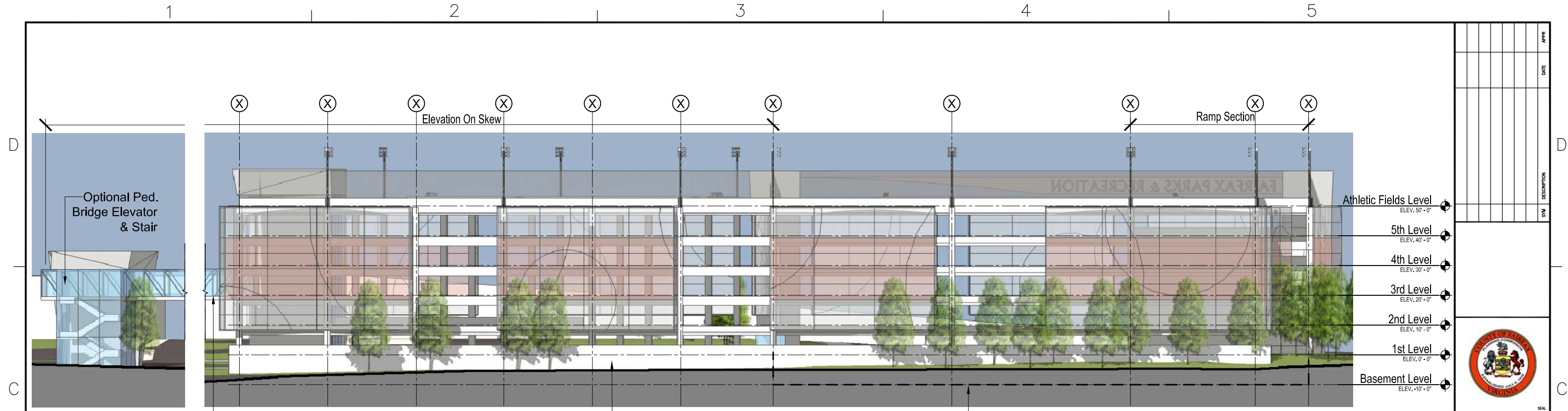
Option 1 - Third thru Fifth

1/32" = 1'-0"

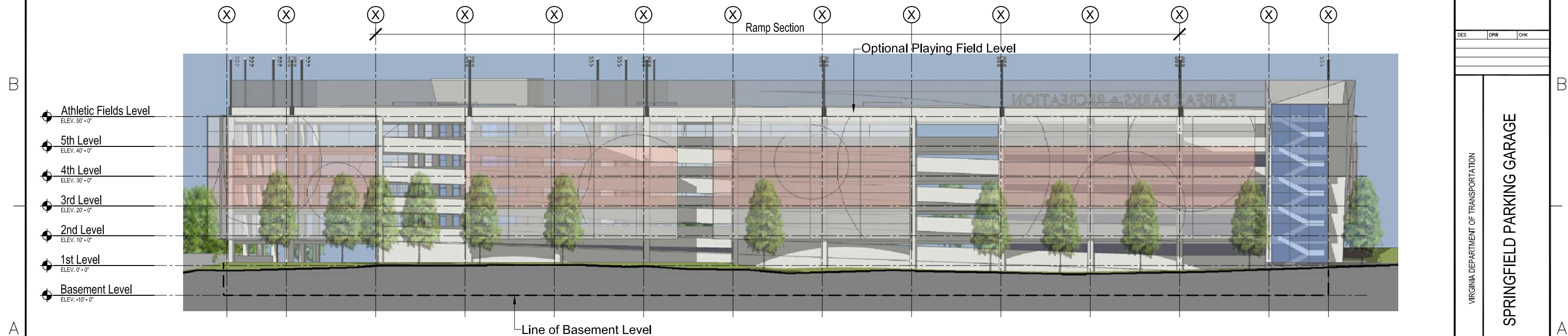
OPTION 1 SUMMARY	
Total Parking Spaces	1022
Short Term Parking Spaces	13
SLUG Spaces	20
Bus Spaces	5
Height to Top Parking Level	40*
* 1 Basement Level Required	



	SEAL SUBMITTED BY  THE LUKMIRE PARTNERSHIP FROM MEMBER APPROVED DES: _____ DRW: _____ CHK: _____
VIRGINIA DEPARTMENT OF TRANSPORTATION SPRINGFIELD PARKING GARAGE	
SCALE: PROJECT NO.: 13247.11 Date: 04.25.2013 SHEET _____ OF _____ Option 1	



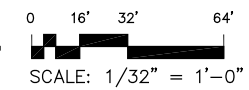
West Elevation with Playing Fields



South Elevation with Playing Fields

Elevations

1/32" = 1'-0"



DATE	DESCRIPTION	APPR.



SUBMITTED BY

 THE LUKMIRE PARTNERSHIP

PROJ MEMBER
 APPROVED

DES	DRW	CHK

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPRINGFIELD PARKING GARAGE

SCALE:
 PROJECT NO.: 13247.11
 Date: 09.03.2013
 SHEET OF
Option 1

Springfield CBC Commuter Parking Garage Study

Appendix A – Additional Elevations

The following elevations illustrate the Option 1 design without metal screen elements and the rooftop recreation facility.

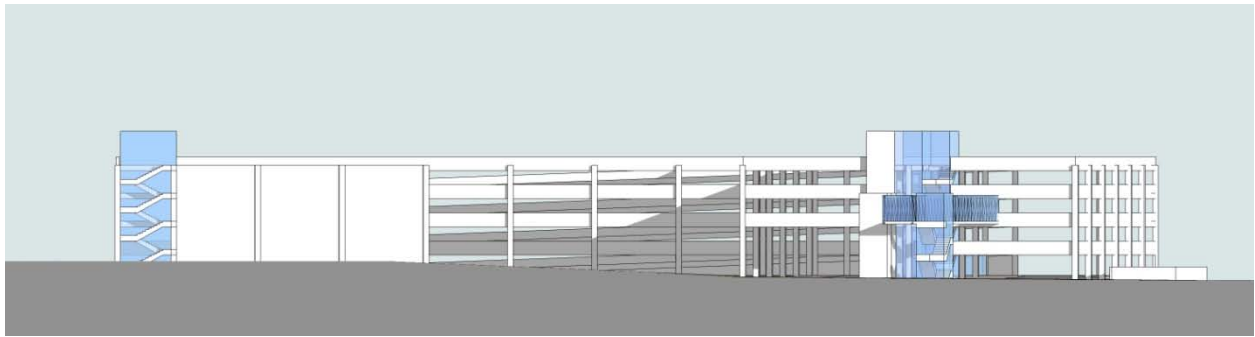


Figure 45 – North Elevation.

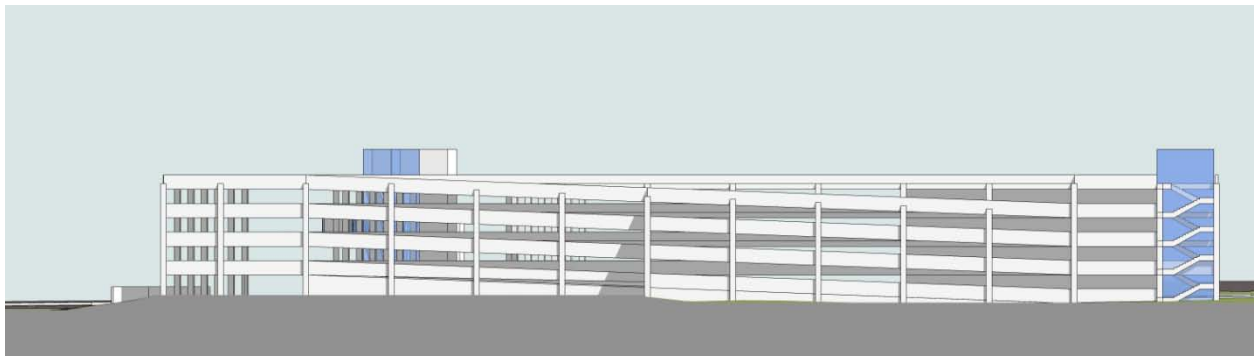


Figure 46 - South Elevation.



Figure 47 – East Elevation.



Figure 48 – West Elevation.

Springfield CBC Commuter Parking Garage Study

Appendix B – Initial Options - Bound separately.

Springfield CBC Commuter Parking Garage Study

Appendix C – March '13 Revised Options – Bound Separately

Springfield CBC Commuter Parking Garage Study

Appendix D – April '13 Revised Options - Bound Separately

Appendix E – Carl Walker Draft Review dated April 12, 2013.



April 12, 2013

Mr. Gregory S. Lukmire
The Lukmire Partnership
2700 S. Quincy Street, Suite 300
Arlington, VA 22206

Re: Springfield CBC Commuter Parking Garage – **DRAFT** Review
Carl Walker, Inc. Project #N1-2013-015

Dear Mr. Lukmire,

We have reviewed the conceptual plans for Options 1 and 3 of the proposed Springfield CBC Commuter Parking Garage. The review is based upon the information shown on the plans. Some of the specific programming requirements, such as the access and revenue control for the proposed parking structure will need further discussion. The access and revenue control system most appropriate for the structure will influence the structure design and may reduce the number of parking spaces near the entry/exit lanes.

We also have prepared an alternate concept plan for the proposed structure. The alternate concept plans, labeled Concept A, are attached to this letter report. Concept A provides about 1,267 parking spaces before accounting for the ADA required accessible spaces. One level is shown below grade, one at grade level, and four supported levels. Four bus berths are included on grade in a north extension of the parking structure. The floor of the top level is at the relative elevation of +45'-4". The three-bay parking structure uses two-way circulation on the sloped bay and one-way circulation on the "flat" bays.

Our review comments of Options 1 and 3 are:

General Comments – Both Options

1. The turning bays scale at 26 foot clear on the drawings which is too narrow for two-way traffic. See the graphic on the next page for an explanation of turning bays. A minimum dimension, with a Level Of Service D, is 26'-6". For this structure, the two-way turning bays should be 28 foot or wider. Level Of Service (LOS) is a classification system developed by traffic engineers to compare intersection and roadway designs. For roadways a LOS A represents a free flow condition with no delays. At the other end of the spectrum, a LOS F represents a "gridlock" condition.

Most parking consultants now use similar classification schemes to compare parking structure design elements. In general, if construction costs are a paramount consideration and the users of the parking facility do not demand superior comfort a LOS C or D can be used for parking structure used primarily by repeat customers and for long term parking.



2. Typically end bay parking will create more spaces and improve the efficiency of the parking structure (square feet per parking space) improving the cost per parking space. Including end bay parking will require modifying the structural column grid. See the discussion below regarding column grids.
3. The parking spaces scale at 9'-0" wide on the drawings. Consider using 8'-9" spaces especially for long term (low turnover) parking. The Fairfax County code allows an 8'-6" minimum space width. We believe an 8'-6" wide parking space is too narrow for this structure.
4. No ADA accessible parking spaces are shown on the plans. For a 1,100 space parking structure 21 accessible parking spaces are required. One in six, or four (4) of the spaces must be van accessible with 8'-2" vertical clearance.
5. Parking space striping extends from the face of each column leaving an unused area equal to the width of the column at each column. It is an accepted practice to allow column encroachment into the parking spaces within a parking structure. Depending on the width of the columns and the width of the spaces, restriping in this manner will create additional spaces in a long run of spaces.
6. The drawings indicate a 10 foot floor to floor height. This is too short for typical pre-cast construction. We recommend using an 11'- 4" floor to floor height for the parking levels with ADA accessible spaces. The 11'-4" height accounts for: 8'-2" minimum clearance for ADA van spaces, 3'-0" depth of structure, and 2" for construction tolerances. A shorter floor to floor height, of about 10'-4" is sometimes used on upper levels to save construction costs.

However, we generally favor the higher 11'-4" floor to floor heights as a higher apparent ceiling in a parking structure generally improves lighting, improves the perception of openness and security, and increases the users' level of acceptance.

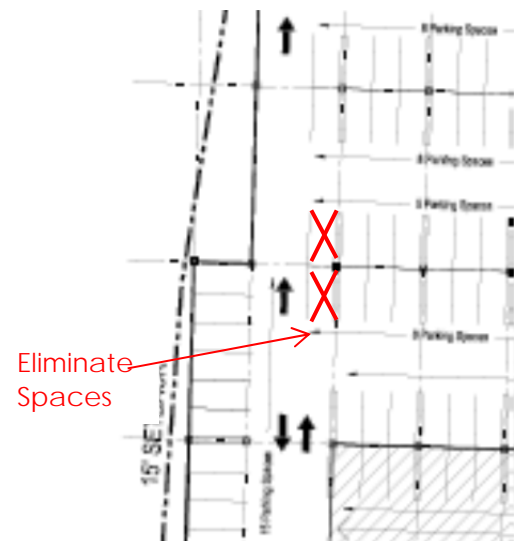
7. One or two additional elevators that directly serve the bus loading area should be considered. Both options require all pedestrians from the parking structure and bound for the bus loading areas to cross the bus traffic on the ground level. Any pedestrian crosswalks, especially walkways crossing bus traffic, should be clearly delineated. The length of the Option 3 structure also increases the need for additional elevators directly serving the bus loading area.
8. The column spacing on the drawings scales to about 30 feet. A more typical and cost effective column spacing for a pre-cast parking structure is 36 feet wide which corresponds to three 12 foot wide double T's. The drawings do not consider the width of the structural elements. The exterior walls and the interior light walls will reduce the usable width of the parking bays to about 58 feet, which is less than the 60'-0" parking module recommended for commuter parking with two-way traffic and 90° spaces.
9. The sports courts on the roof levels will be expensive to construct. Conceptually the construction cost can be estimated at \$100 / s.f. In addition, expansion joints will be required in both Option 1 and Option 3. Option 1 will probably require one expansion joint. Option 3 will probably require expansion joints in two directions. It is not practical to have an expansion joint running through a sports court; modifications to the layout of the sports courts may be necessary.
10. For concept level construction estimates we suggest the following costs:
 - a. Grade Level and Supported Levels = \$50 per square foot
 - b. First Below Grade Level = \$75 per square foot
 - c. Subsequent Below Grade Levels = \$100 per square foot
11. At this time, we are not certain of all the intended user groups of the parking structure. Determining the best operating scenario and the Parking Access and Revenue Control System will require additional conversations concerning the intended users and the entity operating the structure. Likewise, estimating the number of lanes and the queuing space needed requires further programming discussions.

Option 1 Comments

1. Automobile traffic is mixed with the bus traffic at the SLUG parking area which is not desirable.
2. The concept plans do not show any ventilation shafts that will be required for the below grade levels. The ventilation shafts will likely result in fewer parking spaces.
3. Option 1 has bus traffic traveling on supported levels. The depth of structure below the bus traffic areas could be 5'-0" to 6'-0" deep with long span precast concrete construction which could significantly affect the headroom in the lower level. Making the lower levels deeper to compensate for the reduced headroom could further increase the construction costs. Alternatively, short span construction could be used in the below grade levels which would reduce the number of parking spaces provided. Parking space striping in a short span parking structure would be similar to the striping shown on Options 1 and 3 with additional columns located closer to the drive aisle.
4. Consider eliminating the skewed orientation of the northward extension of the structure; instead use a 90° extension similar to Option 3. The angled extension is difficult to construct, is less efficient (square feet per parking space) and increases the construction costs. See the attached drawings for Concept A.
5. Circulation on the upper levels of Option 1 will be improved by moving the sloped bay into the middle of the structure. In addition, this will allow a "level" façade on the south.
6. If the sloped ramps remain in the southern most bay, the direction of the ramps in the southern most bay should be flipped to improve circulation and the search pattern for available spaces. The ramp that starts on the west side should angle upward. The ramp starting on the west should angle downward.

Option 3 Comments

1. Stair location in southeast corner is not consistently located on plans.
2. Parking spaces can be tucked below ramp at the grade level.
3. The drive aisle at the west end of the structure is too narrow. Vehicles backing out of the nearby spaces are likely to hit parked vehicles "broadside". The spaces in the aisle should be eliminated.



- 4. "Crossovers" between parking bays on the long runs can be one way which will add parking spaces and reduce traffic conflicts. The "crossovers" direction should be configured to facilitate upbound and downbound circulation.



Following your review of this letter/report we would be delighted to discuss our comments on Options 1 and 3, and the alternate Concept A. In addition, modifications to the concepts may be necessary to accommodate Parking Access and Revenue Control System (PARCS) equipment in the entry and exit lanes.

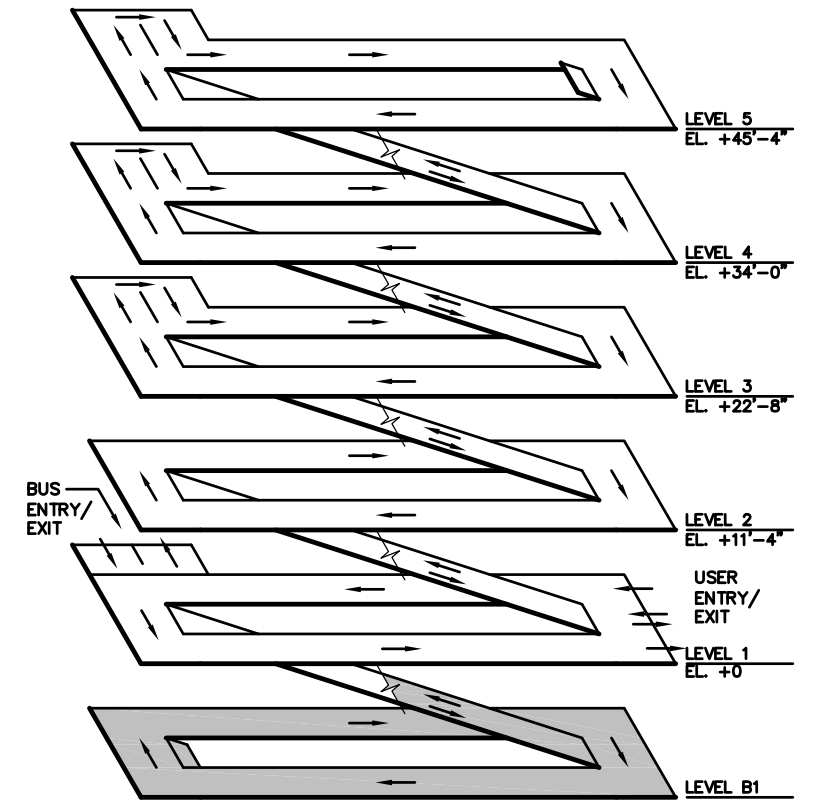
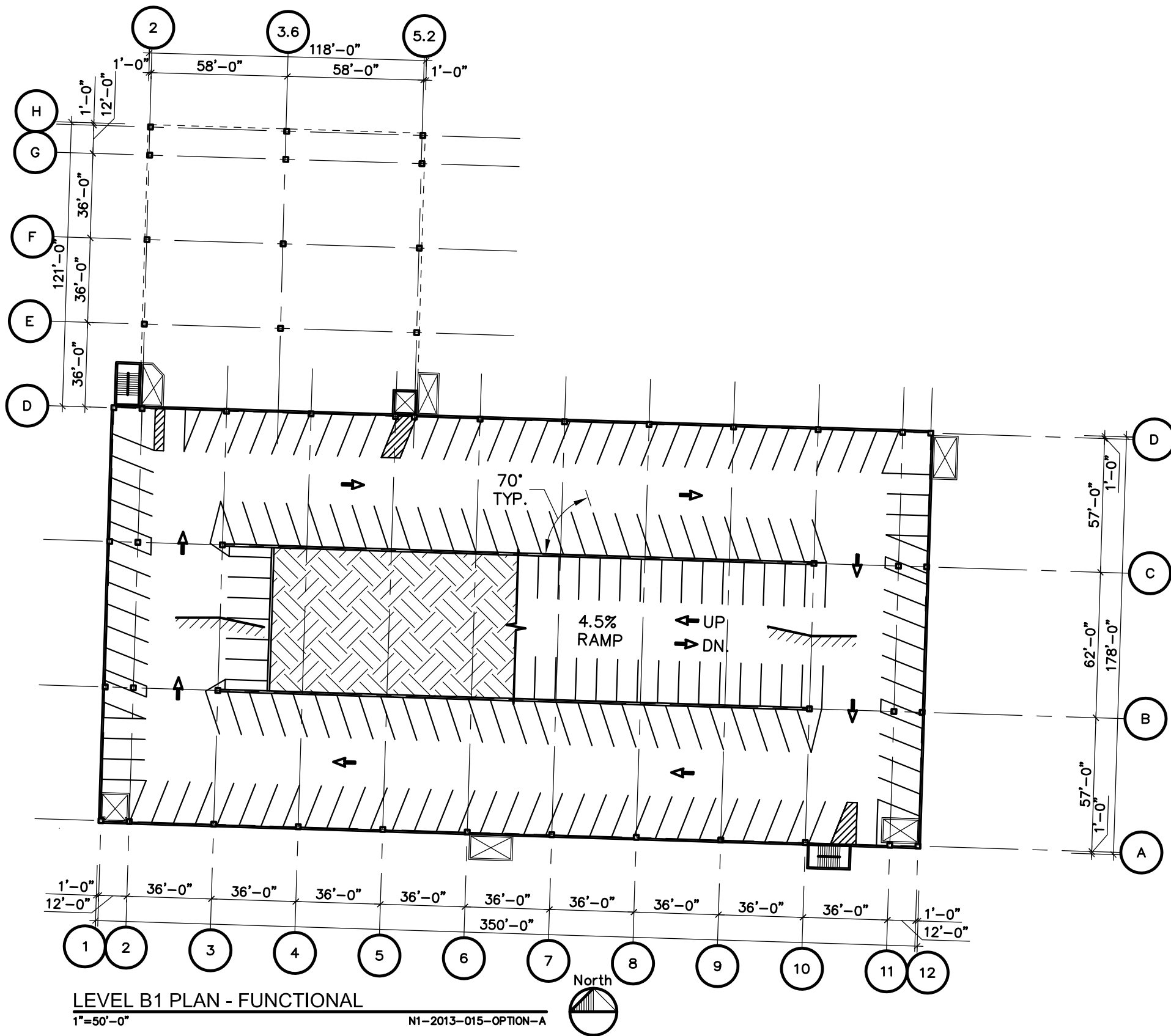
We appreciate the opportunity to review the concepts and develop an alternate concept. We look forward to discussing them with you.

Very truly yours,
Carl Walker, Inc.

Stephen J. Shannon
Managing Principal

William L. Surna
Parking Specialist

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ISOMETRIC
NO SCALE
X-N1-2013-015-OPTION-1-ISO

SPACE TABULATION CHART

LEVEL	STANDARD SPACE	COMPACT SPACE	SHORT TERM SPACE	SLUG SPACE	♿	TOTAL
5	218	*	*	*	*	218
4	243	*	*	*	*	243
3	242	*	*	*	*	242
2	207	*	*	*	*	207
1	58	*	78	38	*	174
B1	183	*	*	*	*	183
TOTAL	1151	*	78	38	*	1267

TYPICAL SPACES @ 8'-9"
SLUG SPACES @ 9'-0"
X-N1-2013-015-CAR-TAB

LEVEL B1 PLAN - FUNCTIONAL
1"=50'-0" N1-2013-015-OPTION-A

LEVEL B1 PLAN & ISOMETRIC

Option A

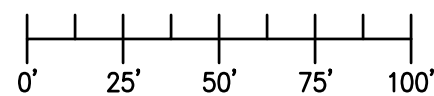
Sheet 1 of 5

April 9, 2013



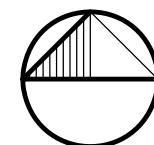
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Carl Walker, Inc.
5136 Lovers Lane
Suite 200
Kalamazoo, MI 49002
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Fax 269.349.4656



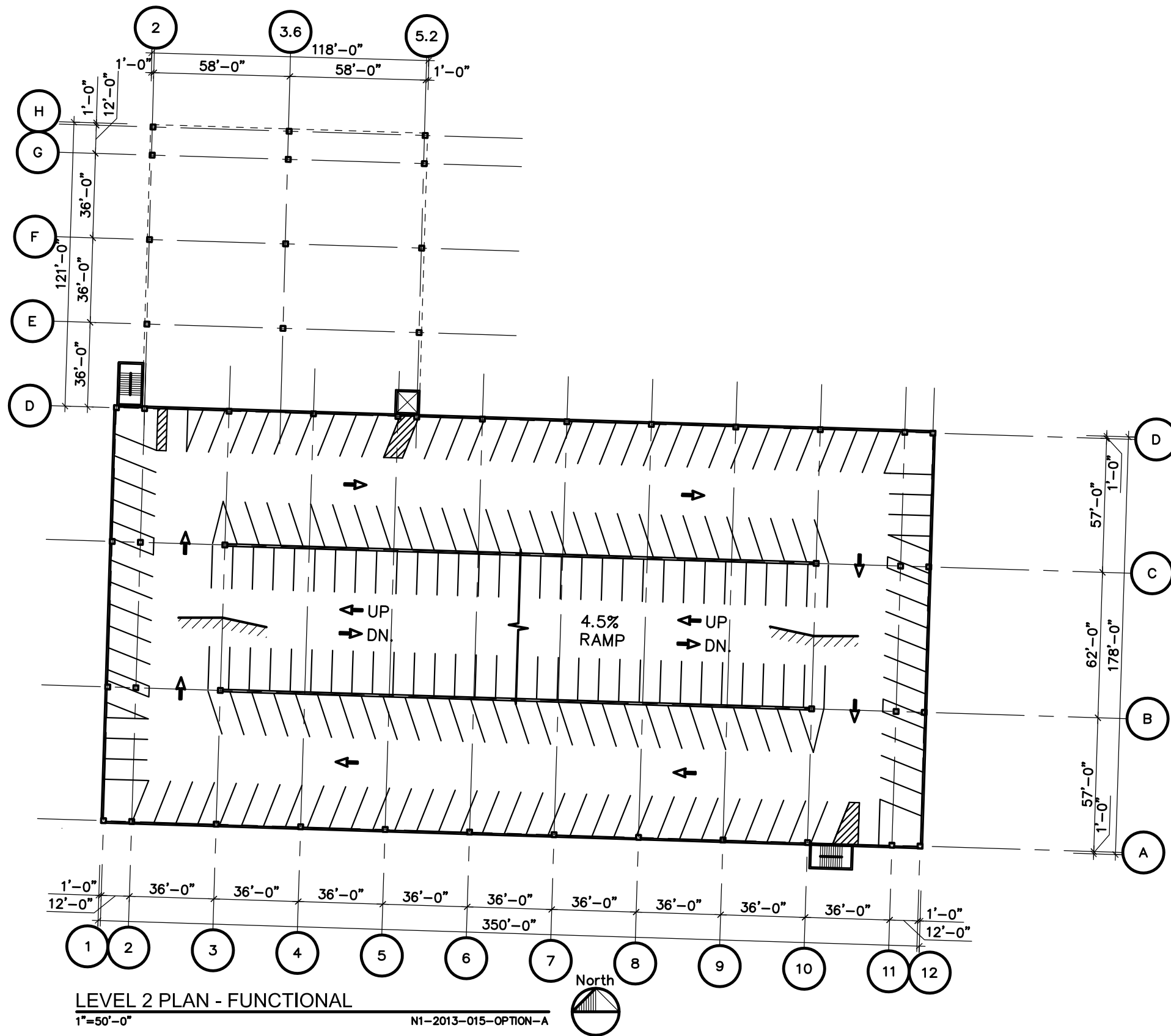
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PROJECT
NORTH



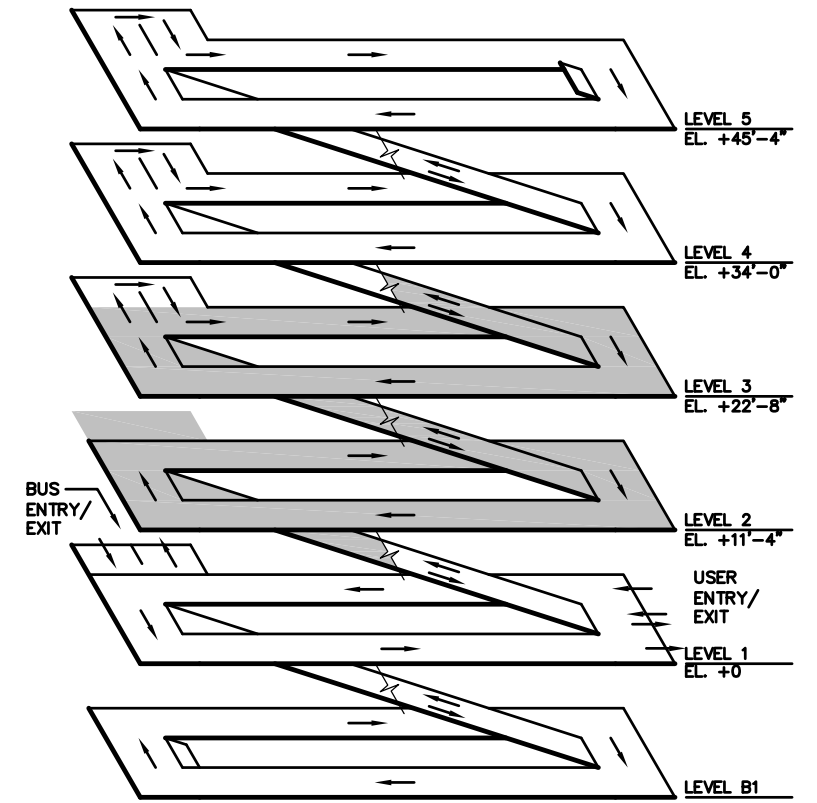
Springfield CBC

Proposed Commuter Parking Garage
Springfield, VA



LEVEL 2 PLAN - FUNCTIONAL

1" = 50'-0" N1-2013-015-OPTION-A



ISOMETRIC
NO SCALE

X-N1-2013-015-OPTION-1-ISO

LEVEL 2 PLAN & ISOMETRIC

Option A

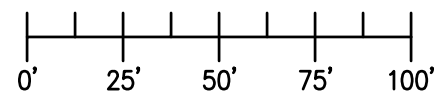
Sheet 3 of 5

April 9, 2013



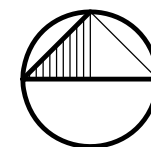
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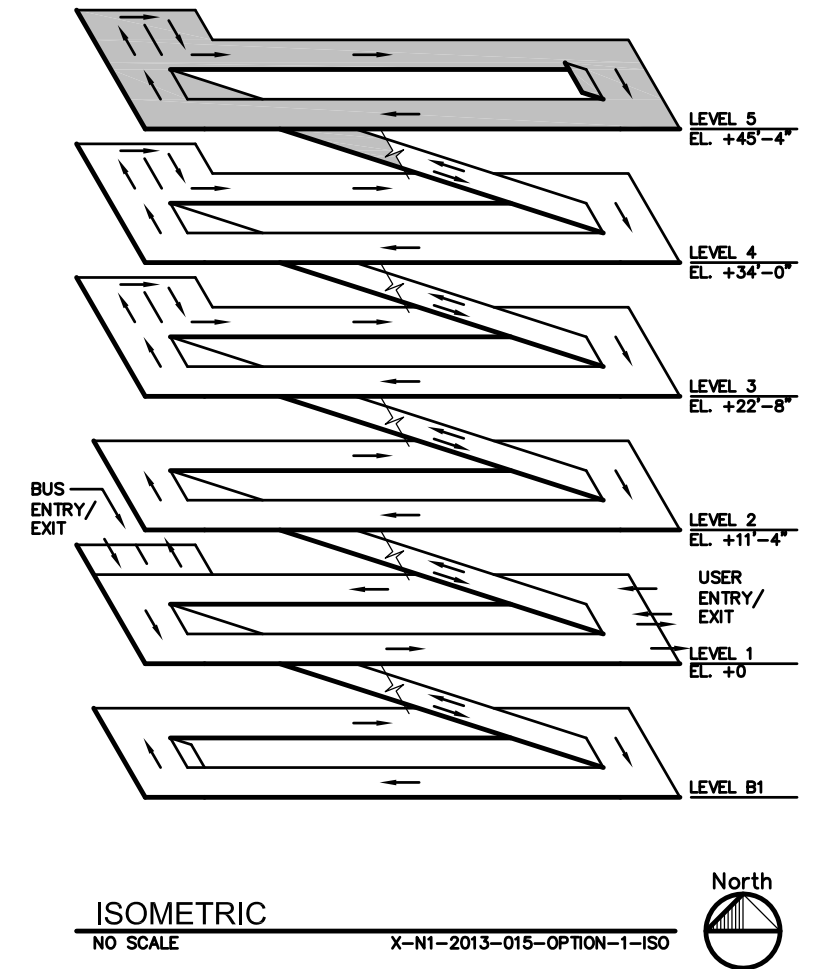
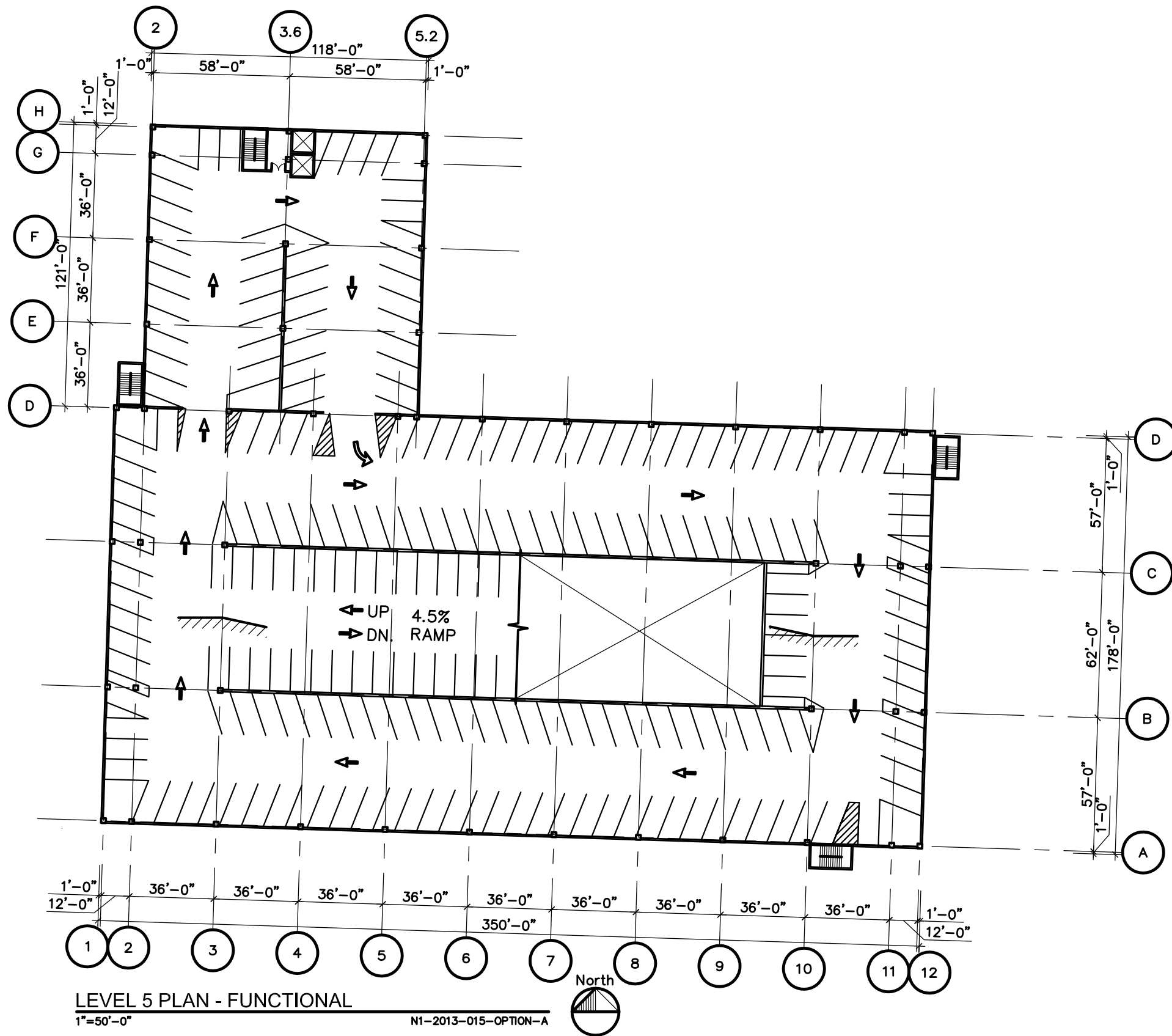
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PROJECT
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Springfield CBC

Proposed Commuter Parking Garage
Springfield, VA



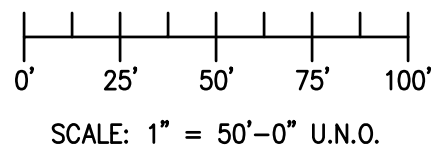
LEVEL 5 PLAN & ISOMETRIC

Option A
 Sheet 5 of 5
 April 9, 2013



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