



TEAM KENTUCKY[®]

JUSTICE AND
PUBLIC SAFETY CABINET

DEPARTMENT OF CRIMINAL
JUSTICE TRAINING

Western KY Training Center | 2022

Comprehensive Site and Feasibility Study

Madisonville, KY

November | 2022



architecture | interiors

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Nov. 4, 2022

Gov. Andy Beshear
Kentucky General Assembly
Budget Review Subcommittee on Justice and Judiciary

The Department of Criminal Justice Training (DOCJT) is continuously revising training to better meet the standards of today's law enforcement officers and community needs. The agency is committed to making Kentucky a leader in public safety by enhancing law enforcement training in order to create safer communities and improve the safety of both law enforcement officers and Kentuckians.

Annually, DOCJT offers basic training to 300 recruits, in-service training to 6,600 officers, school resource officer training to 460 SROs, court security officer training to 430 officers and public safety dispatch training to 1,100 telecommunicators. (Numbers are approximate)

Constructing a DOCJT facility in Western Kentucky will allow law enforcement agencies in the region to continue receiving the top-tier training they have come to expect but keeping those officers closer to home, decreasing transportation costs and reducing work disruptions to the agencies. A Western Kentucky facility will also make more training slots available at DOCJT's Richmond campus for agencies serving Northern and Eastern Kentucky.

We are excited about the possibilities identified that will allow DOCJT to provide the agency's full range of in-service training, including mandated SRO training and advanced skills training, through the construction of a state-of-the-art firing range, tactical training facility, emergency vehicle operations track and driving skills pad, as well as opportunities to conduct basic training for our Public Safety Dispatch Academy classes.

As Kentucky's economy booms with record-breaking growth through investments and job creation, it is imperative that our law enforcement officers are equipped with the training and resources needed to create a better, safer Kentucky for future generations.

Thank you for taking time to review the EOP feasibility study and we look forward to future discussions.

Yours sincerely,

Nicolai Jilek, Commissioner

Acknowledgments

CITY OF MADISONVILLE

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DEPARTMENT OF CRIMINAL JUSTICE TRAINING



JUSTICE & PUBLIC SAFETY CABINET

COMMONWEALTH OF KENTUCKY



UNITED WE STAND
DIVIDED WE FALL



1

Executive Summary

Executive Summary

1.1 Introduction

EOP Architects and RDG Planning & Design, along with their design partners, were engaged to examine the viability for a new DOCJT Western Training Center, to be located in the city of Madisonville, KY. The new training campus would serve the Western half of the State as a companion campus to the Richmond campus. The Campus would accommodate In-service Training, Telecommunications, and State School Resource Officer Training.

Multiple sites within the city of Madisonville were initially evaluated for suitability. Ultimately the Bean Cemetery Road Site was selected as being the most suitable for its relatively flat grade, access to utilities and 300-acre expanse that could accommodate all program requirements and allow for future growth of the campus. The current DOCJT Richmond campus is limited in growth opportunities as it is surrounded by EKU's campus on all sides.

The recommendations contained in this Feasibility study address both programmatic and physical campus facility needs.

Proposed Program and Facilities for the Madisonville Campus:

The program was developed based upon accommodating, In-service class of 30 Officers, Telecom class of 24 trainees, and an 8 hour State School Resource Officer Training.

- Administrative & Classroom Building - approx. 31,000 SF
 - » Administrative Offices
 - » Administrative Support
 - » Training Classroom spaces
 - » Telecommunications CJIS Lab
 - » Locker Rooms
- Indoor Firing Range - approx. 52,000 SF
 - » 30 Lane, 50 Yard Tactical Range
 - » Range Support Spaces
 - » Classroom
 - » Simulator
- Si-munitions, High Bay Training & Maintenance - approx. 43,000 SF
 - » Shoot House - Simunitions Classroom
 - » Vehicle Maintenance & Storage
 - » Training & Maintenance support
- EVOG Track
- Skills Pad

1.2 Methodology

TASK I PRELIMINARY SITE INVESTIGATIONS

The City of Madisonville provided four (4) site opportunities. Each site was evaluated based on Geography, Existing Facilities and Infrastructure, Adjacent Site Context, Environmental Impacts, Usable land area, property ownership, and previous land use. A pros and cons list was developed for each site as an objective means for a selection process to determine which sites warranted further evaluation and consideration.

TASK II FACILITY PROGRAMMING

DOCJT provided a comprehensive Basic Training Syllabus and Staff Matrix which provided the foundation for a series of user group programming sessions. User groups were broken down into the following categories:

- Administration & Facilities
- Training (Basic & In-Service)
- Telecommunication
- State School Security Marshall
- Executive

These work sessions helped identify core facility requirements to accommodate the compulsory training and supporting facility needs. A comprehensive Training Facility Program was then generated based upon this information coupled with RDG's national expertise in planning Public Service Training Facilities.

TASK III PLANNING

Once the Training Facility requirements had been established through programming, the Design Team performed a series of test fits to see how the ensemble of facilities best interacted with the site, both from a programmatic and geographical context. Facilities are arranged providing a non-secure (public) and secure (training) side, that follow a logical progression, as a Trainee moves through the site. The configuration also allows for simultaneous training to occur by providing multiple points of access to each training facility, providing greater efficiency and flexibility of the site.

TASK IV COMPREHENSIVE SITE INVESTIGATION

A series of site investigations were performed to confirm the viability of the site and help identify any potential issues with the proposed site:

- Geotech Report - A series of borings were taken across the site to better understand the underground soil conditions used to support a future building.
- Environmental - a Phase I environmental report was conducted to understand potential for any site contaminants that might require further investigation or mitigation.
- Archaeological Desktop Review - property history was researched to determine if there is any potential for Historical items of importance within the site boundaries.
- Jurisdictional Determination - A decision by the Core of Engineers as to whether areas of the property are regulated under Federal Statutes, i.e. federally -regulated wetland, lake, pond or stream.
- Endangered Species Investigation - Bat Habitat Assessment
- Legal Deed Title Research - To determine clear Title of ownership, that their are no encumbrances, mineral rights, easements etc.

TASK V COST ANALYSIS

A conceptual construction and project cost estimate for the facilities and site improvements identified in the Feasibility Study. Estimates are based on typical methodology of conceptual estimating based on initial programming for the individual building types and programs. Cost estimates were developed by Peak Performance Value (Third-party cost consultant).

TASK VI OPERATING BUDGET IMPACT

This project is not feasible if it cannot be supported with the resources available. The operations of the facility and the associated training services are funded from the Kentucky Law Enforcement Foundation Program Fund (KLEFPF), which is financed through a surcharge on property and casualty insurance premiums. The operating costs of the facility are estimated at approximately \$7 Million annually for program and facility personnel, as well as program and building operating costs. In the first year, an estimated \$1.5 Million is also necessary to properly equip and supply the facility for the range of training programs that will be provided. In continuing years, a maintenance pool will be necessary to support facility maintenance and upkeep.

The annual estimates do not include debt service costs. The debt service costs on a \$146,205,449 project would cost the General Fund budget between \$10.5 and \$11.5 Million annually for 20 years. There is not enough available from the KLEFP Fund to cover both the operating budget expenses and the debt service to build the project.

Operating estimates were developed in conjunction with DOCJT staff, who analyzed current staffing and program costs, and extrapolated that data into an appropriately sized staff and operating budget that can support the training programs proposed. Building operating costs were developed by the feasibility study team, and verified against current operating costs for current DOCJT facilities.

1.3 Feasibility Study Results

The feasibility study team proposes that the State of Kentucky construct the facility summarized in this study in order to relieve the increased pressures and demands upon law enforcement professionals in the State.

This facility will support recruitment efforts, aid in officer retention, and help the State meet the demonstrated data-driven need for in-service, Telecom and School Resource Officer training. This facility will allow the State to meet statutory requirements and maintain a high standard of service for the citizens of Kentucky and the law enforcement community.

Facility	Unit	
Administration/Classroom/CJIS Lab/Mock Call Center	31,073 GSF	\$19,249,559
Indoor Firing Range	51,925 GSF	\$26,470,107
Sim/High Bay Training/Maintenance	42,738 GSF	\$17,870,496
Skills Pad	324,000 Site SF	\$8,132,325
EVOC Track	729,071 Site SF	\$7,618,490
Site Development	250,000 Site SF	\$9,102,746
GC's Contract Amount		\$88,443,733
Soft Costs (Design, DECA, Permit, Legal, Testing)	15%	\$13,266,560
Furnishings, Fixtures, Equipment		\$7,096,540
Owners Pre-construction Contingency (Discovery + Stakeholder Input)	5%	\$5,440,342
Owners Construction Contingency	10%	\$8,844,373
Sub-Total		\$123,091,548
Escalation	.09% per Month	\$23,113,901 (Assumes November 2024 start = 25 months)
Grand Total		\$146,205,449





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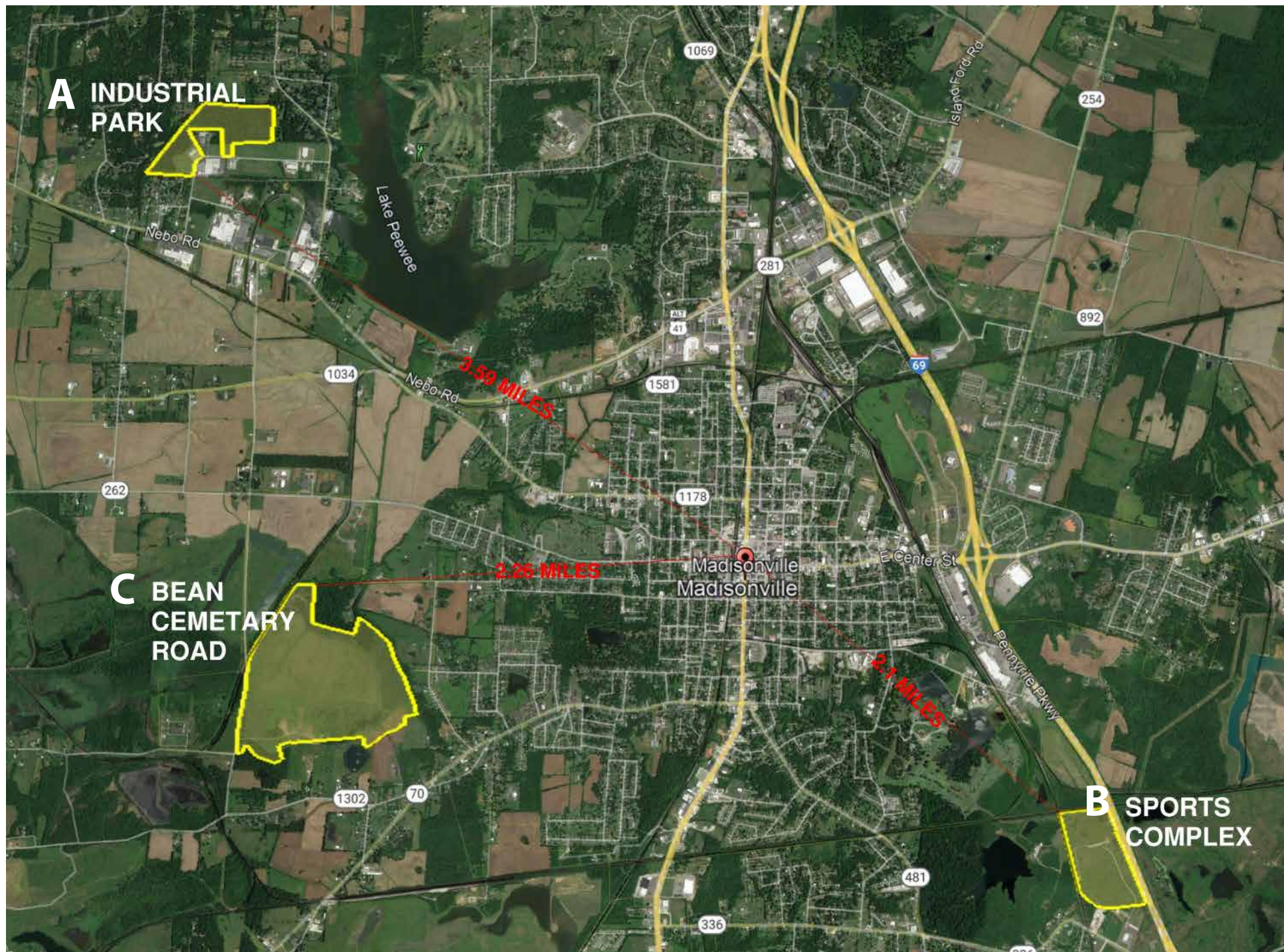
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2

Discovery



SITE SELECTION

The City of Madisonville has proposed an initial site (A) to be considered for the location for the new training facility. After initial analysis and test fit on this first site was completed and found to be limiting, the City of Madisonville put forward two additional sites (B & C) to be studied for possible consideration. The initial site and the two additional sites were analyzed and are illustrated in the following pages.

DOCJT Western KY Training Facility				
Conceptual Campus Program				
September 23, 2022				
Description	Master Plan			
	Quantity	NSF Each	Total NSF	Total GSF

CONCEPTUAL CAMPUS PROGRAM

The EOP/ RDG team test fit each site with the core components essential to supporting law enforcement training.

These key components include: an administrative, classroom and physical fitness building; a 30-lane, 50-yard gun range building; a simunitions lab; a high-bay training and maintenance building; a mock police station building; and finally, a new dormitory building. Also included in the test fit exercise were site elements including an EVOC track, skills pad, and a tactical village with street grid and training props such as a mock strip mall and training tower. These elements are shown on the following pages, fit to each site.

ADMINISTRATION/ CLASSROOM BUILDING	Quantity	NSF Each	Total NSF	Total GSF
Net Square Feet			90,229	
Efficiency				60%
Gross Square Feet				150,382

RANGE BUILDING	Quantity	NSF Each	Total NSF	Total GSF
Net Square Feet			41,540	
Efficiency				80%
Gross Square Feet				51,925

SIMUNITIONS & HIGH BAY TRAINING & MAINTENANCE	Quantity	NSF Each	Total NSF	Total GSF
Net Square Feet			42,150	
Efficiency				80%
Gross Square Feet				52,688

MOCK POLICE STATION/ TELECOM TRAINING CENTER	Quantity	NSF Each	Total NSF	Total GSF
Net Square Feet			10,150	
Efficiency				85%
Gross Square Feet				11,941

DORMITORY	Quantity	NSF Each	Total NSF	Total GSF
Net Square Feet			37,440	
Efficiency				80%
Gross Square Feet				46,800

Total Campus Net Square Feet			221,509	
Campus Efficiency				71%
Total Campus Gross Square Feet				313,735

Site A (A1& A2)

Greater Madisonville Industrial Park Properties

Existing Site Description

Site "A" is actually a pair of sites located approximately 3.6 miles to the west of the city center, northwest of Lake Peewee. This site is owned by the City of Madisonville Industrial District with a portion of the site, considered as a possible acquisition, owned by Pace Analytical Services, LLC. The main access from town is from Nebo Road via Industrial Road. These parcels are surrounded on the north, east and west by large rural residential lots and on the south by industrial lots.

The A1 site includes parcels M-2-1-10 and M-3-1-6-15 for a total of 46.69 acres. This site is undeveloped, has significant grade change and a drainage corridor which flows directly into Lake Peewee, the water supply for the town of Madisonville.

The A2 site (the westernmost lot shown on the diagram), is a combination of 3 properties owned by the City of Madisonville. Included are the M-3-1-6-17, M-1-6-1 and M-1-6-2 parcels for a total of 23.4 Acres. The property is currently the location of the Kentucky Tech/ Madisonville Community College JobNet Career Center. This existing building is a pre-engineered metal building that could be reused for a portion of program.

This proposed location has major grade changes across both site A1 and site A2. There is a change in elevation on site A2 ranging from a 7% to 14% grade with multiple ravines running off an east-west oriented ridge. Site A1 also has major grade changes ranging from 8% to 11.5% – steep grades with ravines flowing into a stream and feeding into Lake Peewee.

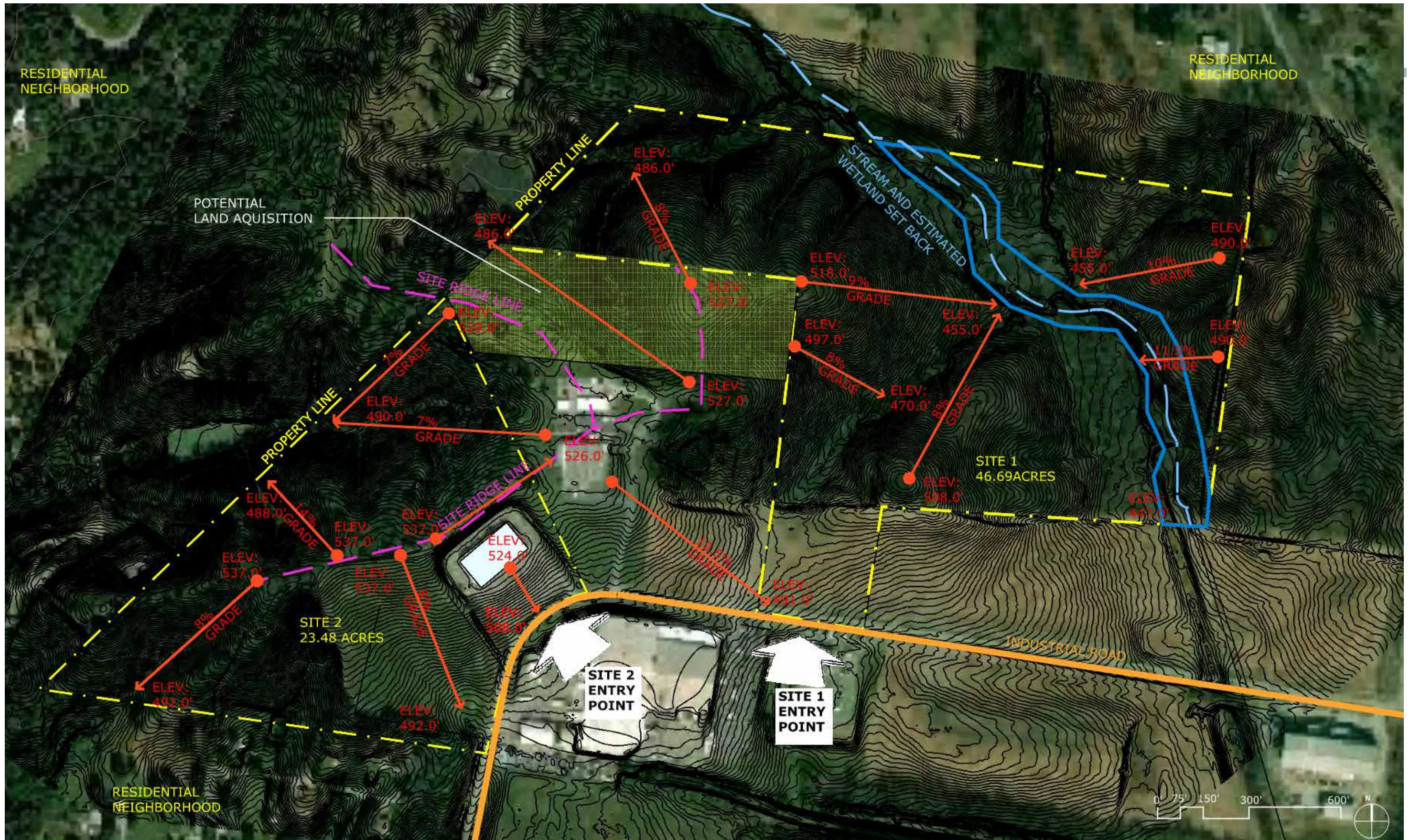
Both sites are heavily forested, excluding the area around the Career Center building and associated parking lot.

All utilities are accessed from Industrial Road, including sewer and water and power.

The A1& A2 Sites are not directly adjacent to each other, and the city suggested a possible acquisition of the north portion of the intermediary site to create a connection between site A1 and A2.



Right: Industrial Park Site Photos



Site A (A1& A2) Greater Madisonville Industrial Park Properties

Site Test Fit

As a starting point, the preliminary site assessment is based upon a capacity of 3 (three) concurrent 40 (forty) person academies. Initial space types and sizes have been used based on historical data and review of class schedule.

Initially, sites A1 and A2 were to be considered separate sites with test fits to be done for each to see how the full program would fit. After the initial test fit of site A2, it became clear the full list of program elements could not be accommodated on either of the sites independently, and both sites would have to be considered together.

The existing pre-engineered metal building was shown as re-purposed for classrooms and a two-story addition was added to house offices, fitness/training spaces and auditorium space. A new gun range and simunitions building is located just north of the existing pre-engineered metal building. The dormitory building is placed on the existing clearing to the south of the pre-engineered metal building. An outdoor rifle range is located further to the north along the northern property line. A small a 400'x 400' skills pad was shown on the western parcel, A2, along with a three-block street grid. The smaller-than-typical EVOC track would not fit on this western parcel, so instead was placed on parcel A1.

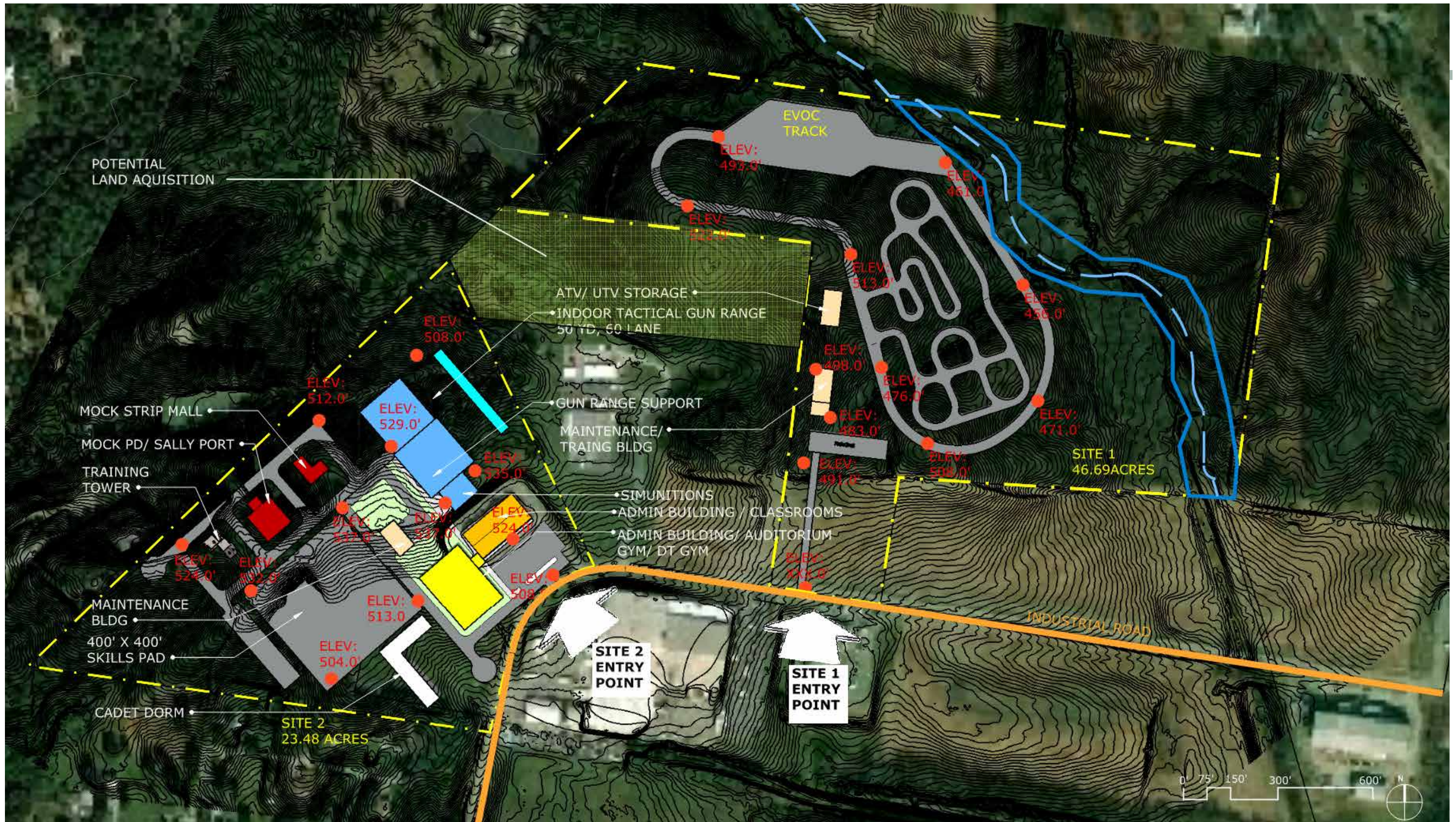
With the existing grades and ravines on both sites, significant grade work would be necessary to flatten the site for a successful layout. Even then, the site also has no growth potential for additional program elements. The proximity to residential neighbors is not ideal for use of this site as the possibility for disturbance of neighbors is high.

The wetland area surrounding the existing stream on site A1 feeds the water source for the Town of Madisonville, and any built intervention on the site would have to mitigate runoff and pollutants into this waterway.

The design team recommends that this site not be considered as the location for the new training facility.



Right: Industrial Park Site Photos



Site B Old Sports Complex

Existing Site Description

The Old Sports Complex site is located approximately 2 miles to the southeast of the city center. This parcel, MAP-108-5-3, is currently owned by Hopkins County. The site is approximately 96 acres, but only approximately 75 acres are available for new development, after considering the existing Archery Complex. The parcel is an old mine site, the implications of which are currently unknown. A more comprehensive geotechnical report would need to be prepared to fully understand the impacts.

The parcel is accessed via the Grapevine Road exit from Pennyville Parkway (Interstate 69). The property is bounded on the east by Interstate 69, to the north and west by the P&L and CSX rail lines and on the south by Grapevine Road.

The site is shared with the Western Kentucky Archery Complex, which sits on the very southeastern edge of the site. There is a concrete plant between Grapevine Road and the SW property line, and across the railroad tracks to the southwest is a small residential neighborhood. The site is relatively flat with a range between 0.6% and 1.4% slope at the steepest section. The site has minimal slope and drains from west to east with the low side of the site having a 1% annual flood hazard. Any wetlands mitigation will require further investigation.

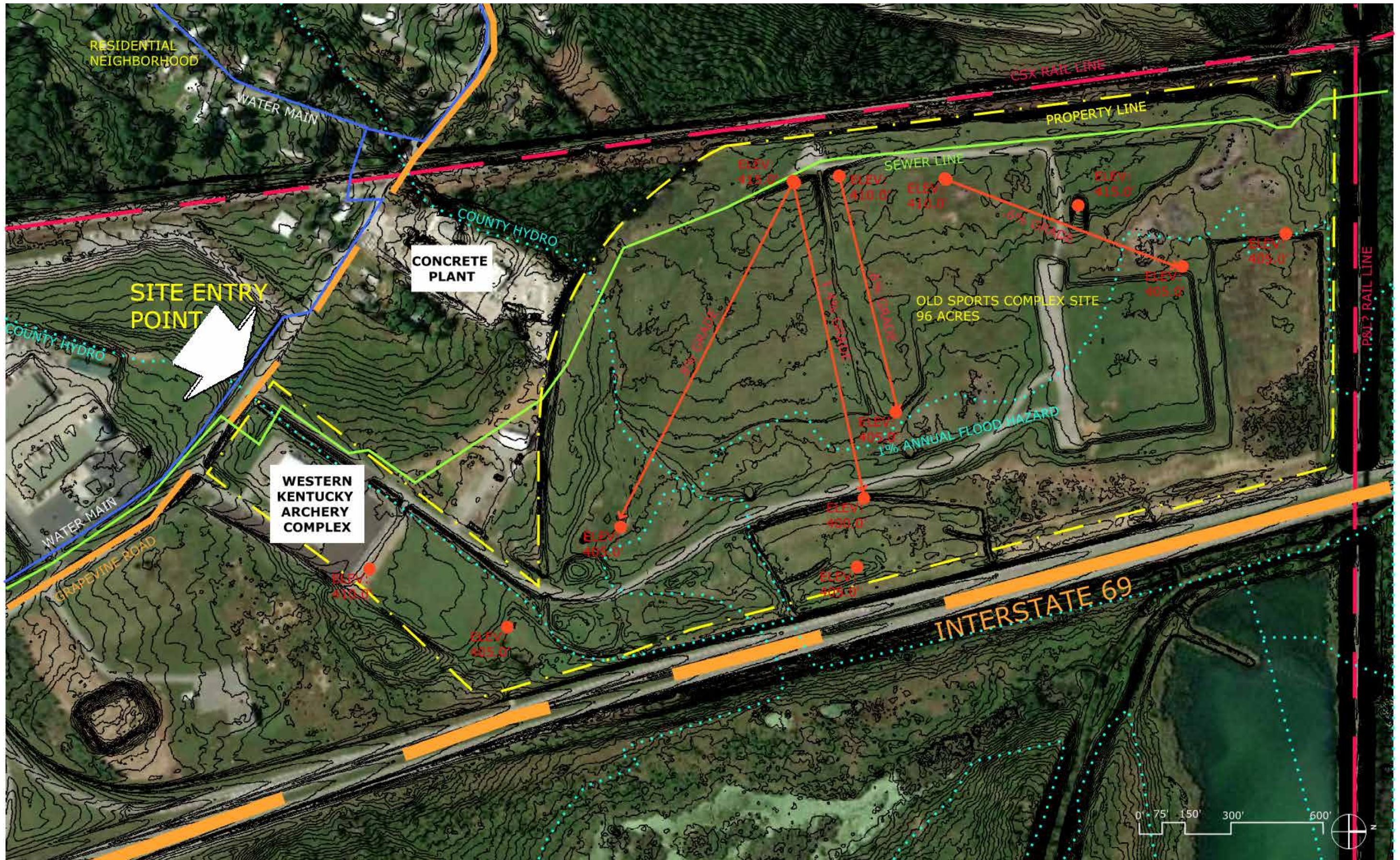
The site is currently open with little or no forested area.

There is a city sewer line that runs north-south on the westernmost edge of the property and City main water lines are located near the Grapevine Road right of way. A more detailed survey would need to be completed to determine where gas and electric would be accessed.

This site ranked more suitable than Site A, due to its overall size and relatively minimal grade differential, but is also not recommended as the most suitable since it has no room for expansion and has high viability from the highway.



Right: Old Sports Complex Site Photos



Site B Old Sports Complex

Site Test Fit

As a stated above, the preliminary site assessment is based upon a capacity of 3 (three) concurrent 40 (forty) person academies. Initial space types and sizes have been used based on historical data and review of class schedule.

In addition to administration and classroom spaces, the program elements included in the test fit were a 50-yard range building, a simuntions building, a vehicle skills training and maintenance building, a mock police station, an ATV/ UTV maintenance and storage building and cadet dormitories, along with multiple training props, an EVOC track, a street grid and a skills pad.

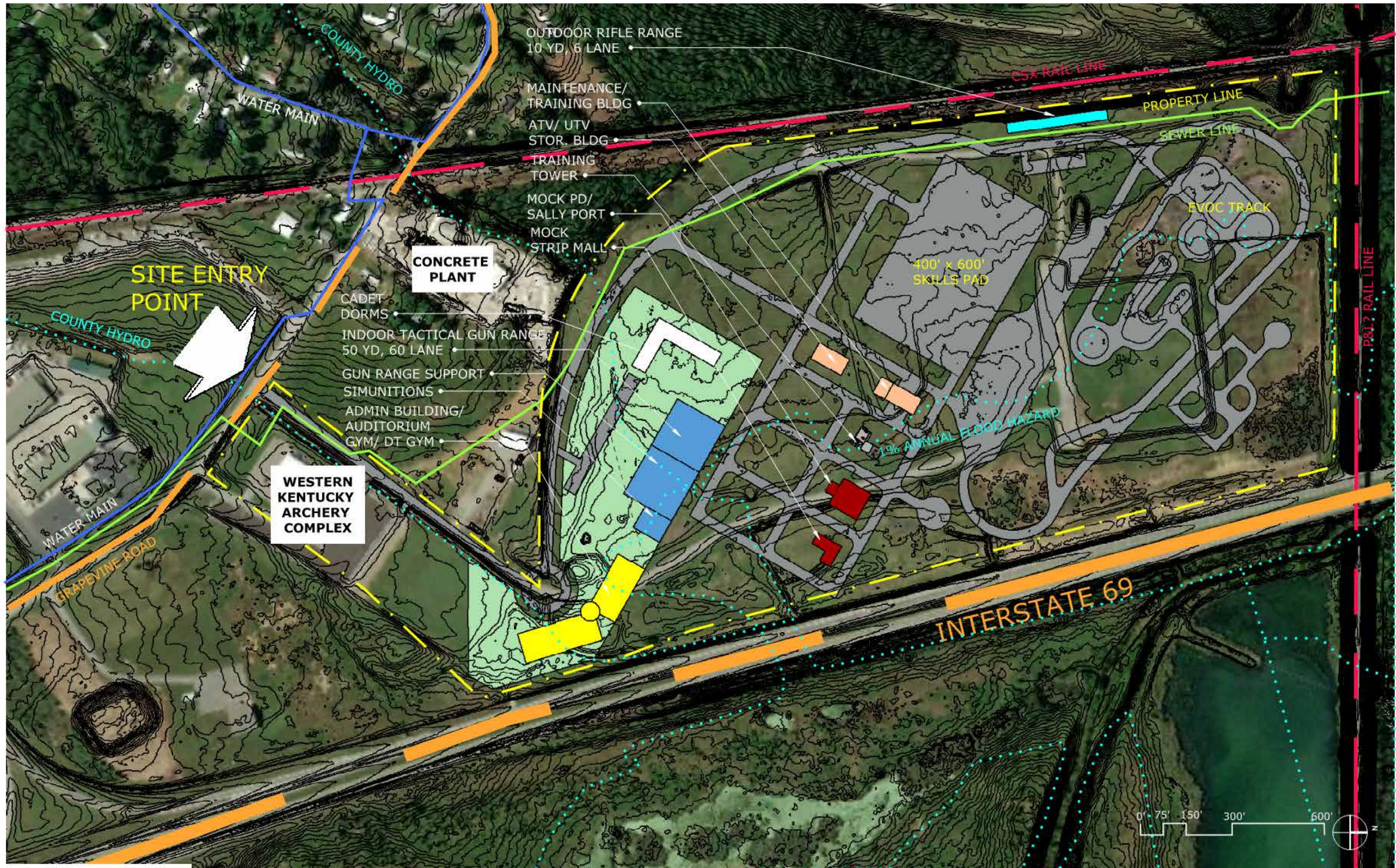
Access to the training facility on the site is from Grapevine Road and the main drive passes next to the Archery Complex. The Administration/ Classroom building acts as the main checkpoint to entering the overall site. The classroom building, gun range and simuntions building, and the dormitory building all fit nicely along the south edge of the site creating a pedestrian-oriented campus quad. An outdoor rifle range is located further to the north away from the main campus along the western property line. The EVOC track in located at the northern edge of the property, a full size 400'x 600' skills pad is located centrally on the site and a six-block city grid also fits on the site.

Although all the programmatic elements fit on this site, there is not any space available for growth or addition of new program elements, should the DOCJT want to expand their programs.

The site has the best access from Interstate-69 but also is extremely visible from the interstate and might become a distraction for drivers on the highway when training exercises are underway.



Right: Old Sports Complex Site Photos



Site C Bean Cemetery Road

Existing Site Description

The Bean Cemetery Road site is located approximately 2.25 miles west of the city center. This site is currently owned by the City of Madisonville and is used as an earthwork landfill. At 332 acres, it is the largest of the three sites. The parcel, like Site B, is a former mine site, the implications of which are currently unknown. A more comprehensive geotechnical report would need to be prepared to fully understand the impacts.

The site is bound on the east and north by a ridge line and the Greasy Creek stream bed, by the P&L rail lines on the northwest, Bean Cemetery Road to the west and Bean Cemetery Landfill Road to the south. The parcel is accessed via Center Street from Laffoon Trail, then south on Bean Cemetery Road.

The site is primarily surrounded by rural, undeveloped properties. The Madisonville wastewater treatment plant is located just west of the site, and a residential neighborhood to the east of the property on the ridge above the creek. Also located along the ridge on the northern edge is an existing city-owned shooting range. The southern edge of the site is a landfill dump site, used primarily for earthwork spoils.

The grades on this site are gentle except for the creek-to-ridge area along the northeast portion of the site. The slope ranges between 1% and 4%, but most of the site is flat or of minimal slope.

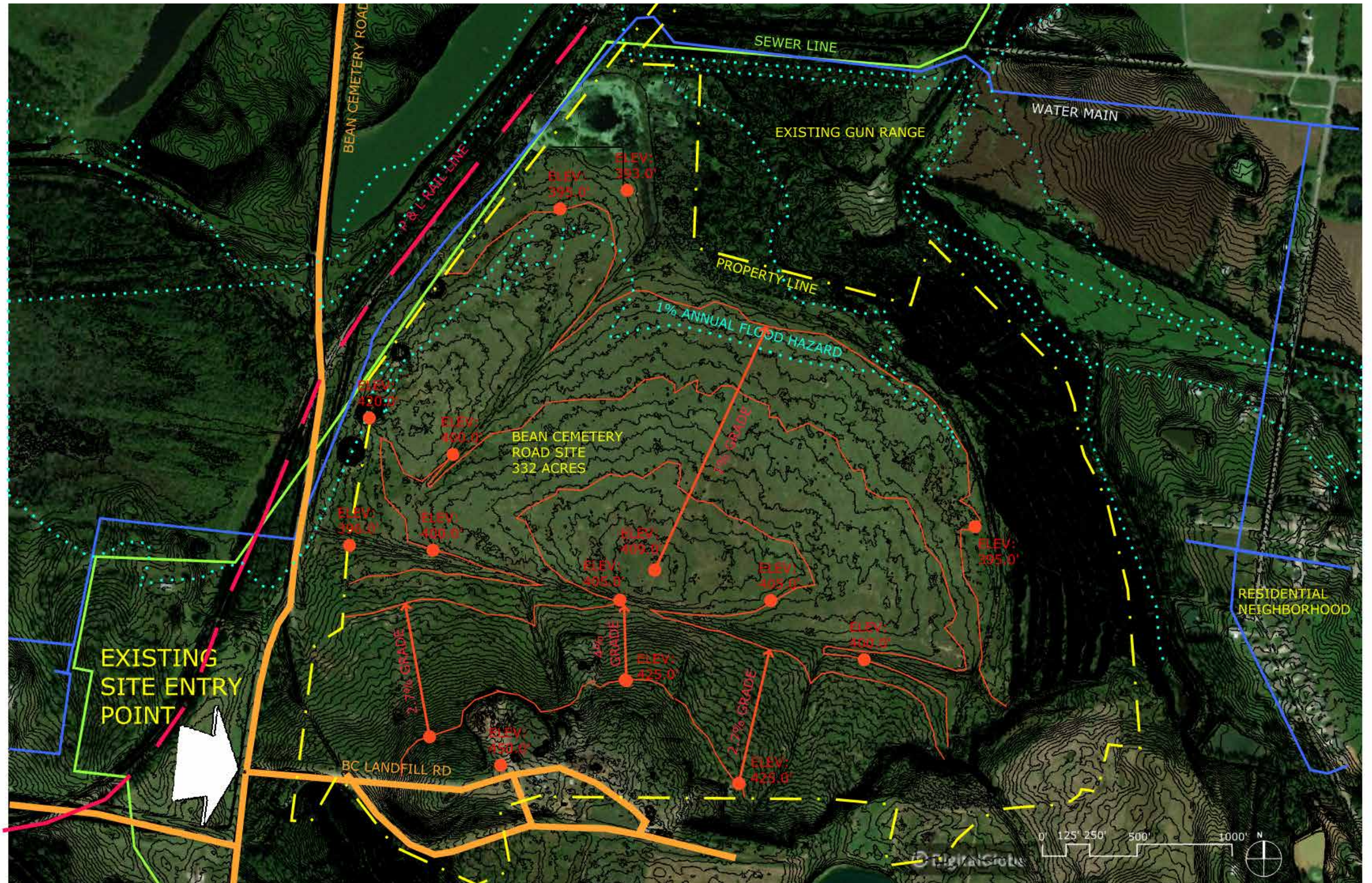
The site is primarily cleared of trees with some forested areas along the creek.

There are some wetland areas defined along the northern edge. Impacts to this wetlands area will have to be further studied.

Water and sewer utilities in the vicinity follow the railroad line to the west. Location of gas and electric lines will have to be further investigated through a more detailed survey.



Right: Bean Cemetery Road Site Photos



Site C Bean Cemetery Road

Site Test Fit

The program elements tested on sites A and B were also tested on Site C. In addition to those elements, an ATV track or unimproved roadways added to the program. Access to the training facility site would presumably be from the west, off Bean Cemetery Road, south of the road/railroad track intersection.

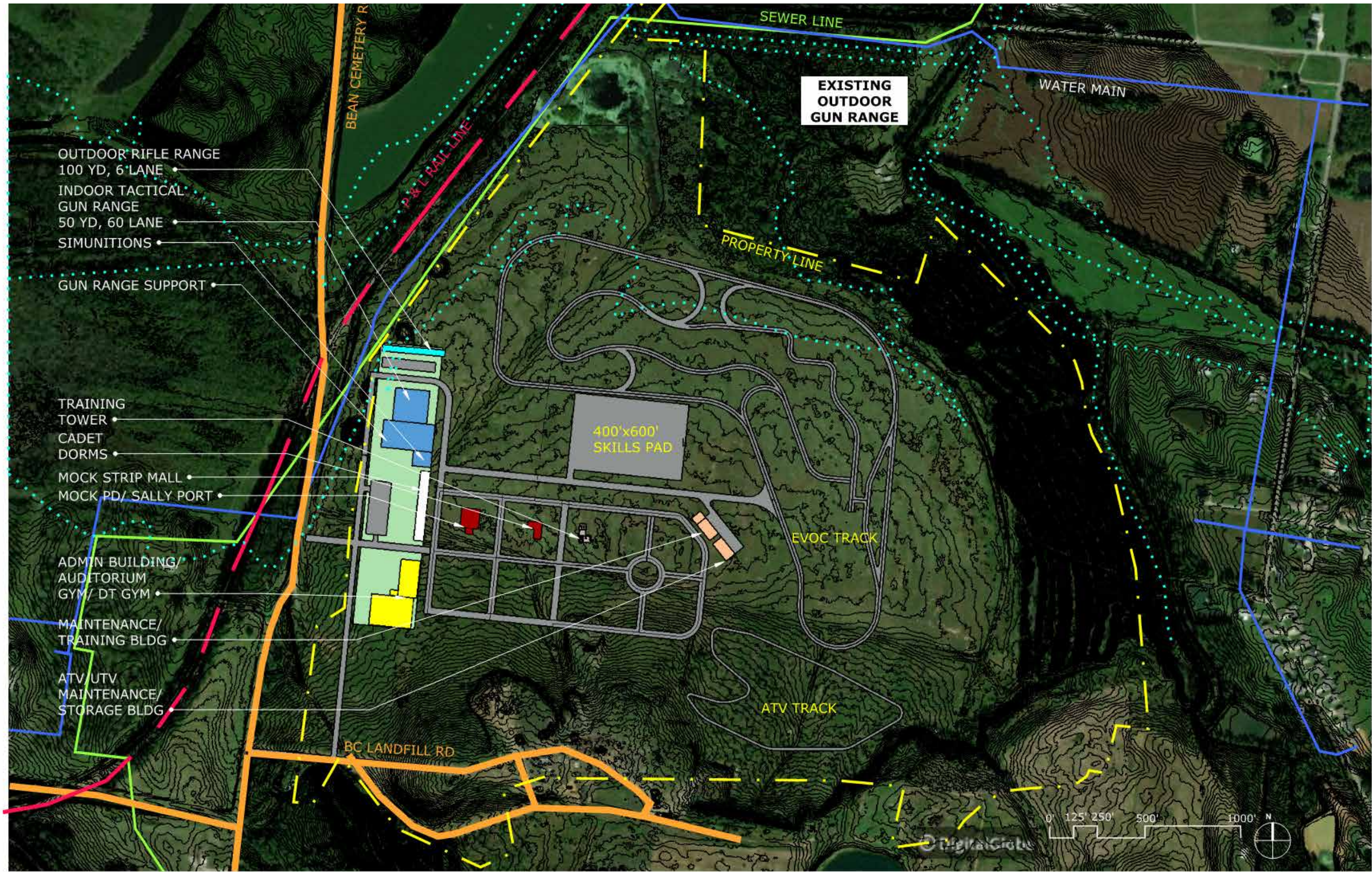
The goal in this test fit was to create a campus quad close to the main site access, which would minimize the amount of road and utilities infrastructure required on site. The main quad would be home to the administration and classroom building, the dormitory building and the gun range and simunitions building. An outdoor rifle range is located just to the east, away from the central part of the campus quad.

To the east and behind the main campus area is located an 8-block street grid with integrated training props, a 400' x 600' skills pad and a large EVOC track. In addition to the Vehicle EVOC track there is room for an ATV/unimproved road. In support of both the EVOC and ATV/UTV tracks are maintenance, storage and training facilities. Even when all these elements are test-fit on the site, there is still space for additional growth should the DOCJT desire to expand its programs in the future.

Overall, this site has the most favorable conditions for the development of a new training facility and is the site the design team would recommend for further due diligence regarding geotechnical, environmental and topographical conditions.



Right: Bean Cemetery Road Site Photos



The preliminary evaluation for each of the sites is as follows :

Site A – Industrial Park

Favorable	Unfavorable	Information
Existing ~20,000 s.f. PEMB	Smallest overall acreage	Owned by the Industrial District
	SIGNIFICANT capital costs to develop site with high slope	
	Would not allow for a full training facility	
	Outdoor training activities have a high potential for adjacent property owner disturbance	
	Wetland area feeds municipal water source	
	No potential for future growth	

Site B – Old Sports Complex

Favorable	Unfavorable	Information
Site access adjacent to archery complex	Site access easily controlled	Owned by the County
Relatively flat site	EXTREMELY VISIBLE from Interstate	Historical wetlands mitigation will require further investigation
Should accommodate most programmatic elements for basic training	Training activities distracting for drivers on Interstate	
Nearest residential properties are across railroad tracks	Dust produced from country road or ATV driving could blow over the Interstate	
Best access to i-69 of three sites	Previously disturbed site from mining operations	
	Site size is unfavorable for possible future growth	

Site C – Bean Cemetery Road

Favorable	Unfavorable	Information
Largest overall acreage	Previously disturbed site from mining operations	Owned by City of Madisonville
Will accommodate assumed elements for basic training		Deeded to City as natural landfill
Relatively flat site with gentle south slope allows for variation in training activities		
Not currently near any residential properties		
Site size is favorable for possible future growth		

Bean Cemetery Road Site Considerations

Site History

The proposed Bean Cemetery site is located on the west side of the City of Madisonville, Kentucky. The Madisonville Municipal Wastewater Treatment Plant is located approximately 1,600 feet west of the western boundary of the site. The site has been historically impacted by coal mining activities and was reclaimed by the Kentucky Division of Abandoned Mine Lands (AML) between 1998 and 2004.

The site was surface mine in the West Kentucky No. 14 coal seam and an unnamed upper coal seam by Sentry Mining Company in the 1940's. This coal seam ranged in depths from thirty to sixty feet. This area remained un-reclaimed until the AML project occurred between 1998 and 2004.

In addition to surface mining the site has also been underground mined in both the West Kentucky No. 11 and No. 9 coal seams. The Bell & Zoller Coal & Mining Company, Oriole Mine mined the No. 11 seam which was revealed by map records dated 1967. This coal seam was at approximate elevation 275 MSL. This underlies the surface mining disturbance by approximately one hundred fifteen feet. The Island Creek Coal Company, Pleasant View Mine undermined the site in the No. 9 coal seam which lies at approximate elevation 220 MSL. This leaves approximately fifty-five feet of bedrock between the two coal seams. The regional dip of the coal seam in the area is approximately 2% gradient to the northeast.

In February 1998 the Kentucky Division of Abandoned Mine Lands (DAML) initiated the largest reclamation project ever conducted by the Commonwealth of Kentucky. The reclamation project began in March 1998 and was completed November 1999 at a final cost of \$4,000,000.00. The site grading performed by AML resulted in elimination of the open surface mine pit. This also resulted in a site that has a steeper south to north gradient on the south third of the site and a much gentler south to north gradient on the northern two thirds of the site. This project received the Office of Surface Mining National Reclamation Award for year 2000.

Site Utilities

The site can be served by the City of Madisonville Water and Sewer department. However, to obtain sanitary sewer service it will be necessary to construct a sanitary sewer lift station and approximately 1,600 feet of force main to connect to the wastewater treatment plant. There will also need to be an on-site gravity system constructed to collect wastewater and convey it to the lift station .

The site has access to a six-inch water main which runs adjacent to the west boundary of the site. The City of Madisonville Water Department conducted a single hydrant flow test on hydrant C248 on Bean Cemetery Road. Flow Test results: 81 Static, 380 GPM Flow with no residual pressure. To obtain adequate quantity and pressure to serve the facility an on-site elevated minimum 50,000 gallon water tank will be necessary. An additional alternative would be to upgrade the six-inch line. Further study is necessary to identify the best location in the system to access adequate water supply. However, based on initial review the connection location will be in excess of one mile from the site.

Bean Cemetery Road Structural Considerations

Qualifications of Structural Narrative

Information given herein is based on limited information, and is appropriate only for Programming and preliminary planning information and cost estimating with proper contingencies/design change allowances. All aspects of the project documentation, including (but not limited to) architectural drawings, mechanical/electrical/plumbing drawings, civil/site drawings, report of geotechnical investigation (not yet available) and requirements for major equipment components must be considered.

General Information

Design Criteria:

- 2018 Kentucky Building Code, Second Edition
 - » Hopkins County, Kentucky
- Floor Live Loads, reduced as allowed by code:
 - » Fixed Seat Assembly: 60 pounds per square foot
 - » Movable Seat Assembly: 100 pounds per square foot
 - » Offices: 50 pounds per square foot
 - » Classrooms: 40 pounds per square foot
 - » Storage Mezzanine: 125 pounds per square foot
 - » Stairs: 100 pounds per square foot
 - » Corridors and lobbies on first floor: 100 pounds per square foot
 - » Corridors above first floor: 80 pounds per square foot
- Roof Live Loads, reduced as allowed by code: 20 pounds per square foot
- Ground Snow Load, $p_g = 15$ pounds per square foot
 - » Snow load on flat roofs, including a 5 pound per square foot rain on snow surcharge, will be applied per code
 - » Snow drift loads will be applied at locations subject to low roofs and areas subjected to aerodynamic shading
- Wind Loads:
 - » Ultimate Design Wind Speed: 120 miles per hour
 - » Exposure Category C
- Seismic Loads:

- » Site Class: E, approximated
- » Mapped MCER Spectral Response Acceleration Parameter for Short Periods: $S_s = 0.679$
- » Mapped MCER Spectral Response Acceleration Parameter for 1 second Period: $S_1 = 0.241$
- » Seismic Design Category: D, likely

Material Information

- Concrete (minimum 28-day compressive strength / density)
 - » Mat Foundation (4,000 pounds per square inch / Normal Weight)
 - » Other Foundations, not on mat (3,000 pounds per square inch / Normal Weight)
 - » Concrete walls (4,000 pounds per square inch / Normal Weight)
 - » Elevated Floor Decks (4,000 pounds per square inch / Normal Weight)
- Reinforcing Bars: ASTM A615 Grade 60
- Welded Wire Fabric: ASTM A185
- Steel (ASTM specification / Yield Stress)
 - » Wide Flange & Tee Shapes (A992, $F_y = 50,000$ pounds per square inch)
 - » Channels, Angles, Plates & Bars (A572, $F_y = 50,000$ pounds per square inch)
 - » Hollow Structural Steel Tubes (A500 Grade C, $F_y = 46,000$ pounds per square inch)

Geotechnical and Foundation Considerations

- The Bean Cemetery Road Parcel is an abandoned mine spoil site which used open mining, supposedly to approximately 65 feet deep, with additional shaft undermining below. Mine spoil was left in spoil ridges from the 1940's until early 2000's when it was graded down, such that the spoil in place is slightly less than 20 years in place. No high wall is expected within the development area.
- A site-specific shear wave velocity test will be required as part of the geotechnical investigation.
- The spoil will continue to consolidate such that a specialty foundation remediation will be required to construct above. Due to the spoil depth, we do not expect that deep foundations or rammed aggregate pier remediation will be feasible.

- An undercut, with reinforced earthen mat overlaid with a structural waffle mat is expected to be most reasonable for reducing risk of differential settlement while maintaining a fundable construction cost.

We have found that waffle mat foundation to be substantially more economical approach for construction than a structural slab supported on grade beams, pile caps and deep foundations while providing greater stiffness and the ability to bridge over the inconsistent nature of spoil sites than conventional foundations. Trade-offs for this savings come from increased risk and decreased flexibility to both the owner and contractor.

Mat foundation systems consist of monolithically poured concrete slabs and grade beams which are supported by the existing subgrade on a uniform plane. The primary advantage of this system (in addition to the cost benefit noted above) is that its stiffness allows the entire foundation to act more uniformly to resist stresses that may be induced by the near-surface variability in subgrade reaction modulus. This advantage comes at increased risk and more rigid procedures of construction, as noted below.

Owner's Risks

1. The foundation could tilt.

As the fill consolidates, the foundation could potentially tilt to reflect the resulting settlement profile. Technically referred to as rigid body rotation, this characteristic, while minimizing the differential settlement of the facility, may have adverse effects on equipment that must be remain level to function at optimal levels. Local settlement that typically causes sticking doors, brick/masonry veneer cracking, etc. is normally reduced.

2. Limited flexibility is present for future modifications to the mat.

While the mat has capacity for future loads that may be added, the mat has very limited potential for cutting, coring, trenching etc. through any portion of the system, including the slab. This is due largely to the system's strength being derived from the stiffness afforded by pouring the slabs and grade beams monolithically. Work to add or remediate MEP systems that may be placed now or may be desired in the future will be severely limited. Something as minor as installation of a new sink will require prior analysis and approval from a structural engineer. With this in mind, the Owner and design team should think long-term and make any requests now regarding future provisions.

Construction Issues

1. Construction Sequencing

A mat foundation cannot be cast in the same construction sequencing as a conventional slab on grade or other deep/shallow foundation system. The earth cannot be considered to be capable of supporting the building during partial construction. Similar depth spoil fills have been observed to severely consolidate and crack the foundations simply under the self-weight of the concrete alone. The entire mat needs to be in place before any load can be applied, and therefore the construction sequencing generally needs to be similar to:

- Install undercut and engineering earthen mat.
- Stake out building.
- Install plumbing and other utilities underneath the earthen mat
- Excavate for waffle grade beams.
- Install vapor retarder.
- Install reinforcing.
- Cast grade beam and mat slab monolithically.

All perimeter grade beams elements shall be furnished with a lean concrete mud mat so that the edge can be accurately formed. Grade beam elements and slabs must be poured in one continuous operation. Grade beams are not to be poured first with slab poured later. Construction joint locations will be noted on the design drawings.

2. Coordination of Trades

Long runs of utilities should be placed under all elements of the foundation (below the grade beams), and not in the concrete or in the DGA fill under the slab portions. It is critical that all trades have a clear understanding of installation sequencing as related to the concrete pour. If local plumbing is to be located within the panel of a waffle, the utility can go below the slab in the DGA. However, if the run goes across the building between panels, it needs to be deep with the top of the utility at a minimum of 5 feet below the finished floor. MEP stub-ups, slab recesses or slopes, etc. are required to be fully coordinated prior to beginning construction of the mat. Flexible connections should be utilized where tie-ins to external utilities occur. Blockouts in the slab generally should not be permitted. The MEP has to be in place and double checked before the mat is in place. Sawcutting the mat after casting because of a missed plumbing rough-in will generally should be prohibited.

3. Other Considerations

Care will need to be taken in trenching and utility backfill. Generally, backfill trenches inside the building with flowable fill and not open graded aggregate, as open graded aggregate acts as a French Drain allowing water to move under the building causing consolidation of the fill and poor performance of the foundations. It is imperative that the Geotechnical report be completely understood by the contractor and all architectural/engineering disciplines. The geotechnical engineer should be consulted regarding any questions. A general discussion between the geotechnical engineer and construction manager is highly recommended.

Waffle mat foundations should be strategically planned with early collaboration and significant deferral to the structural and geotechnical engineering considerations. Some key considerations include:

- Do not locate building structures over highwalls or other significant variations in spoil depth.
- Provide an undercut and reinforced earthen mat below the foundation system.
- Avoid partial basements. Allow the mat to continue full extent of the building without significant offset in plane.
- Provide for a regular footprint without significant offsets, extensions, or plan appendages. Limit the plan aspect ratio to 2 to 1.
- Reduce superstructure weight by avoiding heavy wall and floor systems.
- Utilize structural and finish systems more tolerant to differential settlement such as steel frames and light stud bearing wall systems.
- Avoid masonry or provide for additional movement in the detailing.
- While these are good practice recommendations, we offer that we have successfully completed several waffle mats over spoil including both masonry veneers and heavy masonry bearing wall/ precast concrete floor systems and also long-span roofs.





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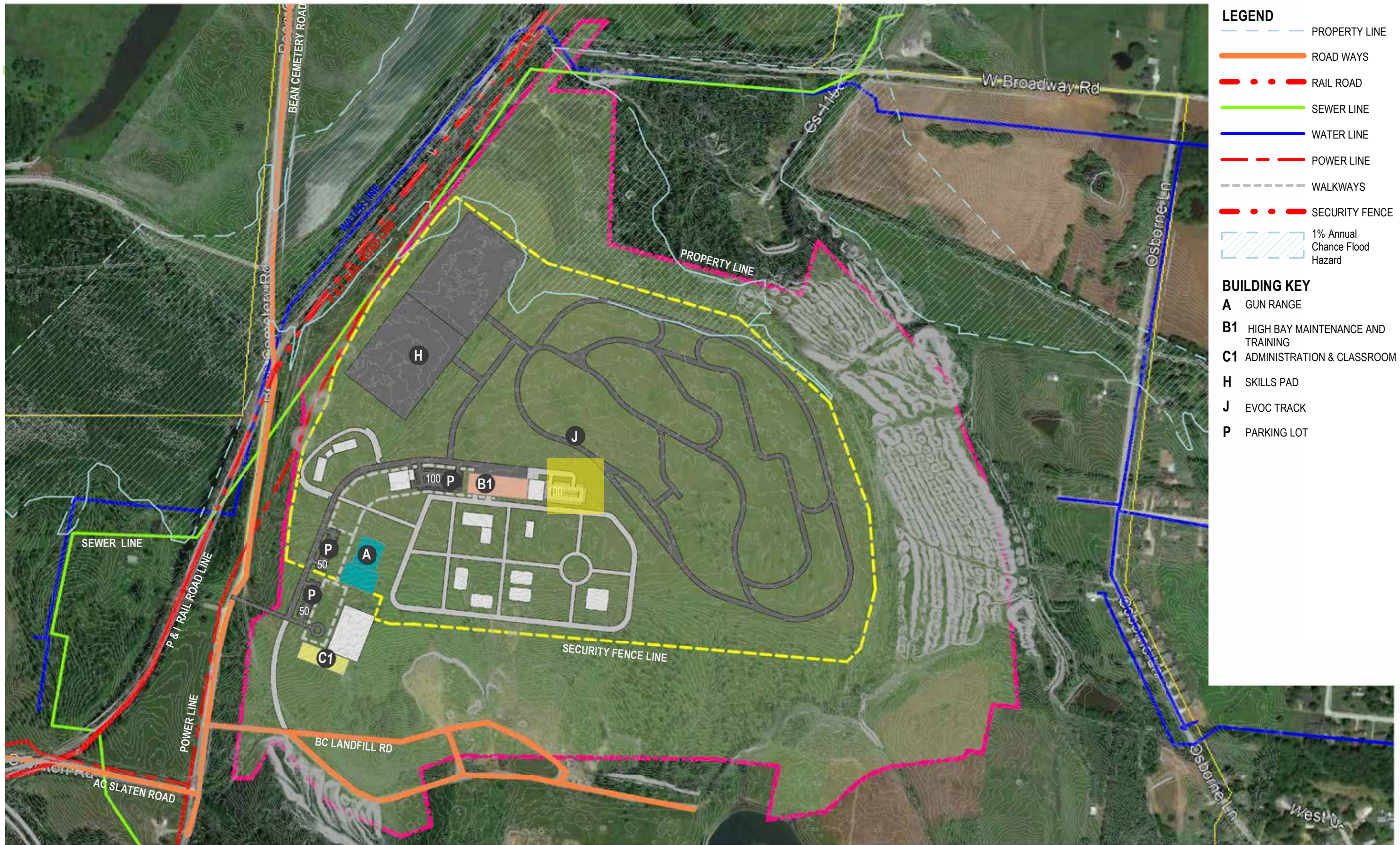
E. HARRIS



3

Master Plan

A master plan is a culmination of efforts that have been informed by a strategic planning process. The process includes an effort to assess people, places and programs. These assessments have been a successful integration of the EOP | RDG design team and the Department of Criminal Justice Training staff and administration.



DOCJT Western KY Training Facility									
Conceptual Campus Program									
October 26, 2022									
Description	Capacity	Seating	Area Each	W	D	Master Plan			
						Quantity	NSF Each	Total NSF	Total GSF
ADMINISTRATION/ CLASSROOM BUILDING						Quantity	NSF Each	Total NSF	Total GSF
Net Square Feet								18,644	
Efficiency									60%
Gross Square Feet									31,073
RANGE BUILDING						Quantity	NSF Each	Total NSF	Total GSF
Net Square Feet								41,540	
Efficiency									80%
Gross Square Feet									51,925
SIMUNITIONS & HIGH BAY TRAINING & MAINTENANCE						Quantity	NSF Each	Total NSF	Total GSF
Net Square Feet								34,190	
Efficiency									80%
Gross Square Feet									42,738
Total Campus Net Square Feet								94,374	
Campus Efficiency									75%
Total Campus Gross Square Feet									125,736

CONCEPTUAL SITE PLAN

Ultimately, the overall size and existing lack of topography on Site C allowed for the greatest opportunities for the success of a new DOCJT in Western Kentucky. The DOCJT elected to pursue further investigation of the Bean Cemetery Site, pending any findings from the geotechnical, legal, and environmental research.

The approximately 335-acre facility is designed to allow concurrent use of training facilities by Department of Criminal Justice without disruption of training between venues. The facility includes a two story 31,000-SF Classroom/Training Building, a single-story indoor gun range, a high bay practical applications building which includes a simunitions lab, and a vehicle maintenance and storage component, a large skills pad and EVOG track are included on site.

Key design elements include:

- Administrative & Classroom Building
 - » Administrative Offices
 - » Administrative Support
 - » Training Classroom spaces
 - » Telecommunications Mock Call Center
 - » Telecommunications CJIS Lab
 - » Locker Rooms
- Indoor Firing Range
 - » 30 Lane, 50 Yard Tactical Range
 - » Range Support Spaces
 - » Classroom
 - » Simulator
- Si-munitions, High Bay Training & Maintenance
 - » Shoot House - Simunitions Classroom
 - » Vehicle Maintenance & Storage
 - » Practicals applications bay
 - » Training & Maintenance support
- EVOG Track
- Skills Pad

Building A - Administration and Classrooms

Facility Description

The Administration & Classroom Building will be a multi-level building and serve as the heart of the Western Kentucky Regional Training Facility. This building will house the administrative offices, classroom training, and Telecommunication CJIS lab functions.

Administrative Space

Administrative Staff office space is sized to accommodate a staff of approximately 30, with some management functions solely in Richmond. This office space will accommodate managers, supervisors, and instructors for in-service training, facilities, finance, telecommunications and state school security marshal divisions. There is a mix of private offices, shared offices, and workstations depending on the job function requirements. This zone is sized to accommodate varying sizes of conference, breakout, and collaboration spaces. This space will be a secure area behind an access-controlled door and priority for visual supervision over the training center.

Classroom & Training Spaces

This building will house the classroom functions of the Center. Classrooms to have folding partition wall to accommodate varying class sizes from a telecommunications class of twenty-four to in-service training up to 100. All classrooms and labs will include dedicated storage spaces to allow for maximum efficiency of class setup. These storage areas will also allow for the flexibility of furniture to be stored away when a larger prop or demonstration occurs in the space.

Telecom training center will accommodate 24 trainees. The Telecom 911 training center will utilize the latest advancements in next generation 911 and radio, including: GIS mapping to allow for pinpoint location, Video feed, and drone access.

The Mock Call Center lab will be set up with 6 trainee stations and 2 instructor stations. This space shall be secured access from the rest of the building. There is an associated observation room with views into the mock call center, where students that are not at the trainee stations can watch scenarios unfold.

A CJIS training computer lab also with additional card reader access and internal to the building with no windows for enhanced security shall be outfitted for 24 students. Each student station will have a dedicated computer set up with computers and screens provided by the facility. Also, to be provided is the associated server room that will service both the Mock Call Center Lab and the CJIS lab only. All of these spaces shall utilize a raised flooring system for ease of retrofit of computer systems.

Support Spaces

To enable the functions described above, this building will include support spaces to provision the staff and trainees. These spaces include simple things such as restrooms, staff locker rooms, break rooms, IT spaces, and a mail/work room – as you may expect in a building of this type. While these support spaces could be viewed as mundane, they provide the critical backbone that will maximize training activities and efficiency.

Plumbing

The plumbing systems will be provided in accordance with the latest edition of the Kentucky Building Code and the requirements of the Commonwealth. The domestic water supply will be connected to the utility system and extended to the mechanical room. Storm and sanitary will be collected within the site and will extend to the utility-owned systems. The work will include all applicable tap and review fees. Domestic hot and cold-water distribution systems will be installed throughout the building, connecting all sanitary fixtures and equipment requiring services. Domestic hot water will be produced using an electric light commercial domestic water heater with a recirculation pump.

A system of sanitary, waste, vent, and drainage piping will be installed to accommodate the building requirements. Water closets and urinals will be flush valve operated. Handicapped facilities will be provided at required locations. The entire system will be installed in accordance with the provisions and requirements of the Kentucky State Department of Health's Plumbing Code. The storm drainage system will be installed and connected to the new storm drainage system.

Fire Protection

Fire protection will be provided in the building and will include 100% coverage. A wet pipe sprinkler system that meets the minimum requirements of NFPA and the Kentucky Building Code will be provided.

HVAC

The building will provide a variable volume air system with reheat. Each control zone will be provided with a programmable thermostat. Cooling will be provided with a Heat Recovery Chiller and an electric booster heater. The controls will be DDC and will be compatible with the States central monitoring system. Bathrooms will be exhausted as required by the Kentucky Building Code and will include energy recovery.

Electrical

The building will be supplied with a 480/277-volt service connected to a



utility provided pad mounted transformer. The internal distribution will include panel boards, step-down transformers and building distribution. Lighting and equipment will be connected to the 480/277-volt supply and convenience power to 208/120-volt distribution.

Emergency power can be provided with a generator and transfer switches. All lighting will be LED selected for the visual task. A new security system will be provided. The security system will consist of video surveillance, access control, security alarms, and panic stations as required in the design-build requirements. The building will have a multiplex Fire Alarm System with individual device annunciation. The system will utilize a digital dialer for remote notification.

A structured cabling communication system will provide. It will include incoming plant cables and horizontal distribution. The communication package will include racks, backboards, outlets and termination.

*Proposed MEP systems are for cost estimate purposes only. Final system selections will be made during design.

Structural

The building construction features the following key elements which impact structural considerations:

- Construction on mine spoils, likely requiring a mat or raft type foundation and flexible building structure.
- Building Risk Category III. Higher Risk Category with increased seismic loading.
 - » Public Assembly Building with an occupant load greater than 250.
- High seismic criteria requiring special design considerations.
- Clear-span, column-free space over the auditorium.
- Multi-level structure with elevator and stair shafts.
- Open-prefunction lobby and entrance canopy.

Considering these elements, the proposed structure consists of the following:

- Mat or raft-type foundation required to maintain a rigid foundation that is less prone to differential settlement. This system will be designed using a waffle-slab approach, which consists of a series of grade beams in orthogonal directions supporting a structural slab.
 - » Mass undercut and engineered fill with geogrid reinforcing below.

- » A vapor barrier is required to be installed under the mat, lapped and taped across the complex excavation.
- » This mat requires elevated care in planning and construction, especially with regards to construction joint placement and underground utility installation.
- » The mat will also furnish as the ground floor slab. All slab recesses, slopes, penetrations, etc. are required to be carefully coordinated.
- » Mat slab to be pocketed so that column base plates will occur below the finished floor level and unobtrusive.
- Basic Structural as a Building Frame System of structural steel.
- Floor structure of 5" concrete slab over composite steel floor deck with composite steel beams spaced at approximately 6'-3" on center.
- Roof structure of SJI open-web steel joists with wide-rib galvanized steel roof deck.
 - » Joists will be supported on wide-flange girders typically and joist girders over the auditorium.
 - » The steel joists will be run up-down the roof slope.
 - » KCS (strengthened) steel joists may be utilized as required for mechanical considerations.
- Lateral Load Resisting System of eccentrically or concentrically braced steel. Due to seismic design category, Steel Systems not Detailed for Seismic Resistance are not permitted.
- Exterior Wall System comprised of cold-formed steel studs with gypsum-sheathing in a rain-screen cavity configuration.
- Special Inspections: Per the Kentucky Building Code, Special Inspections are required. The Owner shall engage a Special Inspector who shall perform duties in accordance with Chapter 17 of the Building Code. Contractor Statements of Responsibility and Structural Observations will also be required by code.



ADMINISTRATION/ CLASSROOM BUILDING				Quantity	NSF Each	Total NSF	Total GSF
Administrative Offices						4,536	
Administration : Support Spaces						5,588	
Administration : Training Spaces						8,520	
Net Square Feet						18,644	
Efficiency							60%
Gross Square Feet							31,073

ADMINISTRATION/ CLASSROOM BUILDING				Quantity	NSF Each	Total NSF
Administration : Training Spaces						8,520
Small Classroom				4	1,200	4,800
Classroom Storage				4	150	600
Observation Room				1	400	400
Mock Call Center				1	640	640
CJIS Lab				1	2,080	2,080
Net Subtotal						8,520

ADMINISTRATION/ CLASSROOM BUILDING				Quantity	NSF Each	Total NSF
Administrative Offices						4,536
Branch Manager Private Office (Host meetings to include ~4-5 people)				1	240	240
Sec Supervisor Private Office (Host meetings to include ~4-5 people)				2	240	480
Private Offices Private Offices				22	120	2,640
Workstations Workstations				4	64	256
Conference Room				1	400	400
Breakout Room				1	200	200
Collaboration Spaces				1	200	200
Study Rooms				1	120	120
Net Subtotal				29		4,536

ADMINISTRATION/ CLASSROOM BUILDING				Quantity	NSF Each	Total NSF
Administration : Support Spaces						5,588
Lobby / Waiting / Vestibule				1	400	400
Reception Desk				1	144	150
Single Unisex Restrooms				2	144	290
Men's / Women's Restrooms				2	450	900
Staff : Men's Locker Room				1	600	600
Staff : Women's Locker Room				1	600	600
Staff : Break Room				1	150	150
Storage / Supply Rooms				1	100	100
Janitor				1	64	64
Maintenance				1	300	300
Telephone/Data				1	64	64
Mechanical / Electrical				1	1,200	1,200
Copy Room / Mail Room				1	150	150
Personal Use Room				1	100	100
Laundry				1	120	120
Loading Dock/Receiving Bay				1	400	400
Net Subtotal						5,588

Building B - Indoor Firing Range

Facility Description

The firearms training facility will accommodate the most realistic training possible while providing a comprehensive, safe environment. The target systems are designed to facilitate qualifying and flexible “move and shoot” training scenarios. A baffle system made of ballistic steel, wood, and acoustical tile will provide protection from bullet ricochet, spatter and escape as well as sound abatement. Ancillary training spaces will include a clean classroom, a dirty classroom, observation rooms, armorer offices, ammunition storage, armory, firearms cleaning room, simulator, and locker rooms.

Facility Statistics

Total Gross Square Feet: 51,925 SF

Length: 50-yard tactical range

Number of Lanes: 30 lanes – clear span without columns or structural divider partitions

Lane Width: 5’

Staging Area Length: 10-yards

Clear height to Bottom of Baffle: 10’ – allow clearance for police patrol vehicles and light tactical vehicles

Features:

Bullet Trap

This system can be used with all pistol, shotgun, and rifle rounds up to .50 caliber Browning Machine Gun (BMG). The granular rubber is made from recycled tires and is a cost-effective solution that will last indefinitely with regular maintenance. Bullet trap maintenance includes raking and lead removal after inspections or approximately 100,000 rounds have been fired per lane. Granular rubber absorbs incoming rounds reducing bullet fragmentation. Reduced fragmentation limits lead dust in the air.

Range Control

Sound isolated control booth with remote control via touch pad computers.

Range Flooring

ADA compliant polished concrete with certified slip coefficient.

Targeting System

Turning and dual running man with computer tablet remote control capability.

Range Ballistic Partitions

Fully grouted minimum 10” CMU or 10” pre-cast concrete panels that conform to the Royal Canadian Mounted Police / Canadian Masonry Research Institute report: Resistance of Exterior Walls to High

Velocity Projectiles to resist a .308 Winchester round. Underwriters Laboratory does not provide ballistic ratings of masonry wall assemblies in UL 752 Standard for Bullet-Resisting Equipment. No armor piecing or enhanced penetration rounds allowed on range.

Ballistic Doors

Provide ballistic doors and frames that comply with Level 8 as per UL 752 Standard for Bullet-Resisting Equipment.

Overhead Door

Provide 10’x14’ overhead door in alignment with staging area before 50-yard firing line for vehicle access. Door must be armored with rolling ballistic panel with 3/8 AR500 plate steel. No armor piecing or enhanced penetration rounds allowed on range.

Baffles

Suspended from ceiling and structure with 3/8” AR500 Plate Steel with FRT plywood splatter boards and acoustic tiles. No armor piecing or enhanced penetration rounds allowed on range.

Range Mechanical System

A range ventilation system meeting the National Institute for Occupational Safety and Health (NIOSH) performance standard requirements have been included in the project budget. The firing range ventilation systems will meet all the requirements outline as recommendations and design considerations in the Department of Health, Education, and Welfare (HEW) publication number NIOSH 76-130, entitled “Lead Exposure Design Considerations for Indoor Firing Ranges.”

This design standard recommends an average air flow velocity of 75 feet per minute on an empty range, which has consistently provided compliance with the established federal standards for airborne inorganic lead concentration limits. When the design is properly executed, lead concentrations are maintained below the action level of 30 micro-grams per cubic meter (30µg/m³) in an area where the limit shall not exceed (50µg/m³) of air over a time-weighted average of eight hours as measured at the respiration zone of the shooters and the range officer when they are firing from the firing booths according to OSHA 29 CFR. 1910.1025 and 1926.62.

Acoustic Control System

Acoustic panels and surface treatments will meet or exceed OSHA CFR 29 Noise Exposure Limit Guidelines and ASTM RT60 requirement to meet a 1.3-second reverb time across all octaves from 125 Hz to 8000 Hz. frequencies.

Range Lighting

Energy-efficient light fixtures should be used to provide ambient and targeted lighting in the Firing Range. Fixtures should have VDT-compatible parabolic lenses to concentrate light on the horizontal plane and reduce glare on wall surfaces. Lights are controlled by a firing range control system to vary lighting schemes for different shooting and emergency situations. Light baffles shall protect all lights within 40’ downrange of the firing line.

Plumbing

The plumbing systems will be provided in accordance with the latest edition of the Kentucky Building Code and the requirements of the Commonwealth. The domestic water supply will be connected to the utility system and extended to the mechanical room. Storm and sanitary will be collected within the and will extend to the utility-owned systems. The work will include all applicable tap and review fees. Domestic hot and cold-water distribution systems will be installed throughout the building, connecting all sanitary fixtures and equipment requiring services. Domestic hot water will be produced using an electric light commercial domestic water heater with a recirculation pump

A system of sanitary, waste, vent, and drainage piping will be installed to accommodate the building requirements. Water closets and urinals will be flush valve operated. Handicapped facilities will be provided at required locations. The entire system will be installed in accordance with the provisions and requirements of the Kentucky State Department of Health’s Plumbing Code. The storm drainage system will be installed and connected to the new storm drainage system.

Fire Protection

Fire protection will be provided in the building and will include 100% coverage. A wet pipe sprinkler system that meets the minimum requirements of NFPA and the Kentucky Building Code will be provided

HVAC

The building will provide a variable volume air system with reheat. Each control zone will be provided with a programmable thermostat. Cooling will be provided with a direct expansion Chiller and heating with a gas Boiler. The controls will be DDC and will be compatible with the States central monitoring system. Bathrooms will be exhausted as required by the Kentucky Building Code and will include energy recovery.

Ventilation systems are critical to indoor firing range design. Lead ammunition fired at close range release lead vapor and lead fumes as well as lead dust and other toxins. The ventilation system must control exposure to lead. The supply and exhaust air system is critical to the operation of an indoor range and the health of building occupants. The design must include a positive exhaust system for removal of airborne lead. A slight negative air pressure must be maintained on the range, which can be achieved by exhausting five percent more air than is supplied. Ventilation system shall be capable of 75 feet per minute air flow inside the range, HEPA filtration with heating and cooling. Higher exhaust levels to be provided in firing lane areas, ammunition storage areas, and weapons cleaning areas. Armory to have dehumidification.

Electrical

The building will be supplied with a 480/277-volt service connected to a utility provided pad mounted transformer. The internal distribution will include panel boards, step-down transformers and building distribution. Lighting and equipment will be connected to the 480/277-volt supply and convenience power to 208/120-volt distribution.

Emergency power will be provided with a diesel generator and transfer switches.

All lighting will be LED selected for the visual task. A new security system will be provided. The security system will consist of video surveillance, access control, security alarms, and panic stations as required in the design-build requirements.

The building will have a multiplex Fire Alarm System with individual device annunciation. The system will utilize a digital dialer for remote notification. A structured cabling communication system will provide. It will include incoming plant cables and horizontal distribution. The communication package will include racks, backboards, outlets and termination.



RANGE BUILDING		Quantity	NSF Each	Total NSF	Total GSF
	Lobby	1	400	400	
	Armorer Offices	5	100	500	
	Classroom	1	1,200	1,200	
	Classroom Storage	1	120	120	
	Dirty Classroom	2	1,600	3,200	
	Classroom Storage	1	120	120	
	30 Lane x 50 yd Range	1	27,900	27,900	
	Observation Rooms	2	200	400	
	Range Storage	1	600	600	
	Ammo Storage	1	150	150	
	Staff - Women's Lockers	1	600	600	
	Staff - Men's Lockers	1	600	600	
	Firearm Cleaning	1	2,000	2,000	
	Armorer Shop	1	800	800	
	Armorer Storage	1	400	400	
	Firearm Storage	2	400	800	
	Simulator	1	900	900	
	Storage	1	150	150	
	Janitor	1	100	100	
	Mechanical	1	180	180	
	Electrical	1	120	120	
	Break Room	1	300	300	
	Net Square Feet			41,540	
	Efficiency				80%
	Gross Square Feet				51,925

*Proposed MEP systems are for cost estimate purposes only. Final system selections will be made during design.

Structural

The building construction features the following key elements which impact structural considerations:

- Building Risk Category II.
- Construction on mine spoils, likely requiring a mat or raft type foundation and flexible building structure.
- High seismic criteria requiring special design considerations.
- Clear-span, column-free space over the firing range.
- Hardened walls of solid grouted masonry.
- Considering these elements, the proposed structure consists of the following:
 - » Mat or raft-type foundation required to maintain a rigid foundation that is less prone to differential settlement. This system will be designed using a waffle-slab approach, which consists of a series of grade beams in orthogonal directions supporting a structural slab.
 - » Mass undercut and engineered fill with geogrid reinforcing below.
 - » A vapor barrier is required to be installed under the mat, lapped and taped across the complex excavation.
 - » This mat requires elevated care in planning and construction, especially with regards to construction joint placement and underground utility installation.
 - » The mat will also furnish as the ground floor slab. All slab recesses, slopes, penetrations, etc. are required to be carefully coordinated.
 - » Mat slab will be pocketed so that column base plates will occur below the finished floor level and unobtrusive.
- Basic Structural as a Bearing Wall System of concrete masonry. Interior steel frame infill over administration area.
- Roof structure of SJI open-web steel joists with wide-rib galvanized steel roof deck.
 - » Joists will be supported on wide-flange girders at Administration Area.
 - » The steel joists will be run up-down the roof slope.
 - » KCS (strengthened) steel joists may be utilized as required for mechanical considerations.
 - » Long-span (180 feet) clear-spanning double pitched joists at

10 feet on center with subpurlins on bottom chord of P1001 Unistrut at 5 feet on center perpendicular to bottom chord for support of ballistic ceiling and 3" galvanized deep rib roof deck.

- Lateral Load Resisting System of intermediate reinforced masonry shear walls.

- Special Inspections: Per the Kentucky Building Code, Special Inspections are required. The Owner shall engage a Special Inspector who shall perform duties in accordance with Chapter 17 of the Building Code. Contractor Statements of Responsibility and Structural Observations will also be required by code.



Building C - Simunitions, High Bay Training & Maintenance

Facility Description

High Bay Training – 19,200 GSF

This open area 19,200 GSF double height flexible use space that supports multiple training exercises such as, vehicle stop, large class bleachers with AV support in a climate-controlled environment.

Simunitions Shoot House

A 2 story 6,400 GSF reconfigurable simunitions tactical training maze with observation catwalk will be included in this building. The maze can be modified and changed to create different room and clearing scenarios. The maze system can be modified to accept virtual and augmented reality tactical simulator systems

Vehicle Maintenance & Storage Spaces

A 5,940 GSF vehicle maintenance/service bay with storage will be provided. This building will have a minimum 2 vehicle capacity to support basic EVOC and skills pad training. This maintenance includes but is not limited to, topping off fluids and changing worn tires with pre-mounted tires. Storage for tires, fluids and tools in a secured area will also be included. A fueling station will be placed outside and adjacent to the vehicle maintenance building. The vehicle maintenance building will also be provisioned with infrastructure to accommodate electrical vehicles in the future if required.

Storage area will be allocated for campus vehicles (i.e. trucks, Gaters, street sweepers, trailers), as well as additional tires, batteries and other auto parts, to protect them from the elements and to secure the facility resources and supplies.

Training & Maintenance Support

The Training and Maintenance Support areas will contain warehousing and facility maintenance staff offices to support the physical plant operations of the training facility.

Site Requirements

A Parking area for the training fleet of cruisers will be provided near the maintenance building. Space will accommodate around 100 automobiles. There will be direct access into maintenance bays from both the access road and the future tactical village street grid.

Plumbing

The plumbing systems will be provided in accordance with the latest edition of the Kentucky Building Code and the requirements of the Commonwealth. The domestic water supply will be connected to the utility system and extended to the mechanical room. Storm and sanitary will be collected within the and will extend to the utility-owned systems. The work will include all applicable tap and review fees. Domestic hot and cold-water distribution systems will be installed throughout the building, connecting all sanitary fixtures and equipment requiring services. Domestic hot water will be produced using an electric light commercial domestic water heater with a recirculation pump

A system of sanitary, waste, vent, and drainage piping will be installed to accommodate the building requirements. Water closets and urinals will be flush valve operated. Handicapped facilities will be provided at required locations. The entire system will be installed in accordance with the provisions and requirements of the Kentucky State Department of Health's Plumbing Code. The storm drainage system will be installed and connected to the new storm drainage system.

Fire Protection

Fire protection will be provided in the building and will include 100% coverage. A wet pipe sprinkler system that meets the minimum requirements of NFPA and the Kentucky Building Code will be provided

HVAC

The building will provide a direct expansion variable volume air system with electric reheat. Each control zone will be provided with a programmable thermostat. Boiler. The controls will be DDC and will be

compatible with the States central monitoring system. Bathrooms will be exhausted as required by the Kentucky Building Code and will include energy recovery.

Electrical

The building will be supplied with a 480/277-volt service connected to a utility provided pad mounted transformer. The internal distribution will include panel boards, step-down transformers and building distribution. Lighting and equipment will be connected to the 480/277-volt supply and convenience power to 208/120-volt distribution.

Emergency power will be provided with a diesel generator and transfer switches.

All lighting will be LED selected for the visual task.

A new security system will be provided. The security system will consist of video surveillance, access control, security alarms, and panic stations as required in the design-build requirements.

The building will have a multiplex Fire Alarm System with individual device annunciation. The system will utilize a digital dialer for remote notification.

A structured cabling communication system will provide. It will include incoming plant cables and horizontal distribution. The communication package will include racks, backboards, outlets and termination.

*Proposed MEP systems are for cost estimate purposes only. Final system selection will be made during design.



Structural

The building construction features the following key elements which impact structural considerations:

- Building Risk Category II.
- Construction on mine spoils, likely requiring a mat or raft type foundation and flexible building structure.
- High seismic criteria requiring special design considerations.
- Clear-span, column-free, double-height space over the flexible-use space.
- Rigging points to the roof structure.
- Considering these elements, the proposed structure consists of the following:
 - » Mat or raft-type foundation required to maintain a rigid foundation that is less prone to differential settlement. This system will be designed using a waffle-slab approach, which consists of a series of grade beams in orthogonal directions supporting a structural slab.
 - » Mass undercut and engineered fill with geogrid reinforcing below.
 - » A vapor barrier is required to be installed under the mat, lapped and taped across the complex excavation.
 - » This mat requires elevated care in planning and construction, especially with regards to construction joint placement and underground utility installation.
 - » The mat will also furnish as the ground floor slab. All slab recesses, slopes, penetrations, etc. are required to be carefully coordinated.
 - » Mat slab will be pocketed so that column base plates will occur below the finished floor level and unobtrusive.
- Basic Structural as a Building Frame System of structural steel.
- Roof structure of SJI open-web steel joists with wide-rib galvanized steel roof deck or PEMB with ancillary beams for rigging.
 - » Joists will be supported on joist girders.
 - » The steel joists will be run up-down the roof slope.
- Lateral Load Resisting System of eccentrically or concentrically braced steel. Due to seismic design category, Steel Systems not Detailed for Seismic Resistance are not permitted. Tension-only bracing is not permitted.
- Special Inspections: Per the Kentucky Building Code, Special Inspections are required. The Owner shall engage a Special Inspector who shall perform duties in accordance with Chapter 17 of the Building Code. Contractor Statements of Responsibility and Structural Observations will also be required by code.

SIMUNITIONS & HIGH BAY TRAINING & MAINTENANCE		Quantity	NSF Each	Total NSF	Total GSF
Training Spaces					
	Practical Applications Bay	2	9,600	19,200	
	Shoot House - Simunitions	1	6,400	6,400	
	Classroom	1	1,200	1,200	
	Private Offices	2	120	240	
	Private Offices				
	Net Subtotal			27,040	
Vehicle Maintenance & Storage Spaces					
	Vehicle Maintenance Bay	1	2,400	2,400	
	Vehicle Storage	1	3,200	3,200	
	Compressor Room	1	48	50	
	Tire Storage	1	200	200	
	Battery Storage	1	90	90	
	Net Subtotal			5,940	
Training & Maintenance Support					
	Restrooms	4	144	580	
	Janitor	1	80	80	
	Telephone/Data	1	100	100	
	Mechanical / Electrical	1	150	150	
	Break / Vending Room	1	300	300	
	Net Subtotal			1,210	
	Net Square Feet			34,190	
	Efficiency				80%
	Gross Square Feet				42,738





Site Item H: Driving Skills Pad

Facility Description

The driving skills pad, site plan item H, is approximately 500' x 1100' where police officers and cadets will practice a wide variety of driving techniques. These may include (but are not limited to):

- Skid control techniques during controlled braking exercises.
- Straight line skids and 90 degree turning skids.
- The pad may also be used to set up various slow speed exercises using traffic cones.
- Officers will apply learned techniques for serpentine, 9-3 steering, shuffle steering, lane changes, backing, and parking.

Following are various types of training that can be performed on the driving skills pad:

- Serpentine steering
- High risk stops
- Diminishing clearance exercises, primarily for large rigs
- Braking techniques (ABS and non-ABS)
- Confined space turns
- Combined pursuit techniques
- Offset alley maneuvers
- Skid control practice
- Four-corner exercises to acquaint drivers with the location and clearance of each side of the car
- Proper seating and steering techniques
- Emergency driving maneuvers
- Controlled braking
- Urban environment driving techniques
- Proper backing techniques and practice
- Complex cone course driving
- Vehicle dynamics training

This Skills Pad is very large and could be split to provide a driving skills area and an Open Training Area which will be a central training venue for many large, open space training activities such as:

- Mass trauma response exercise
- Automobile extrication exercises
- Active shooter tactic response
- "CERT Rodeo" events for community response drills (portable fire extinguisher; sandbags; light debris removal, etc.)
- Natural disaster large functional response exercise
- Mobile Field Force/Crowd Control

Site Elements

The site will also be provided with LED lighting appropriate for the venue and as required for security of the site. The site will also be provided with security cameras and controlled access.

Site Item J: EVOC

Facility Description

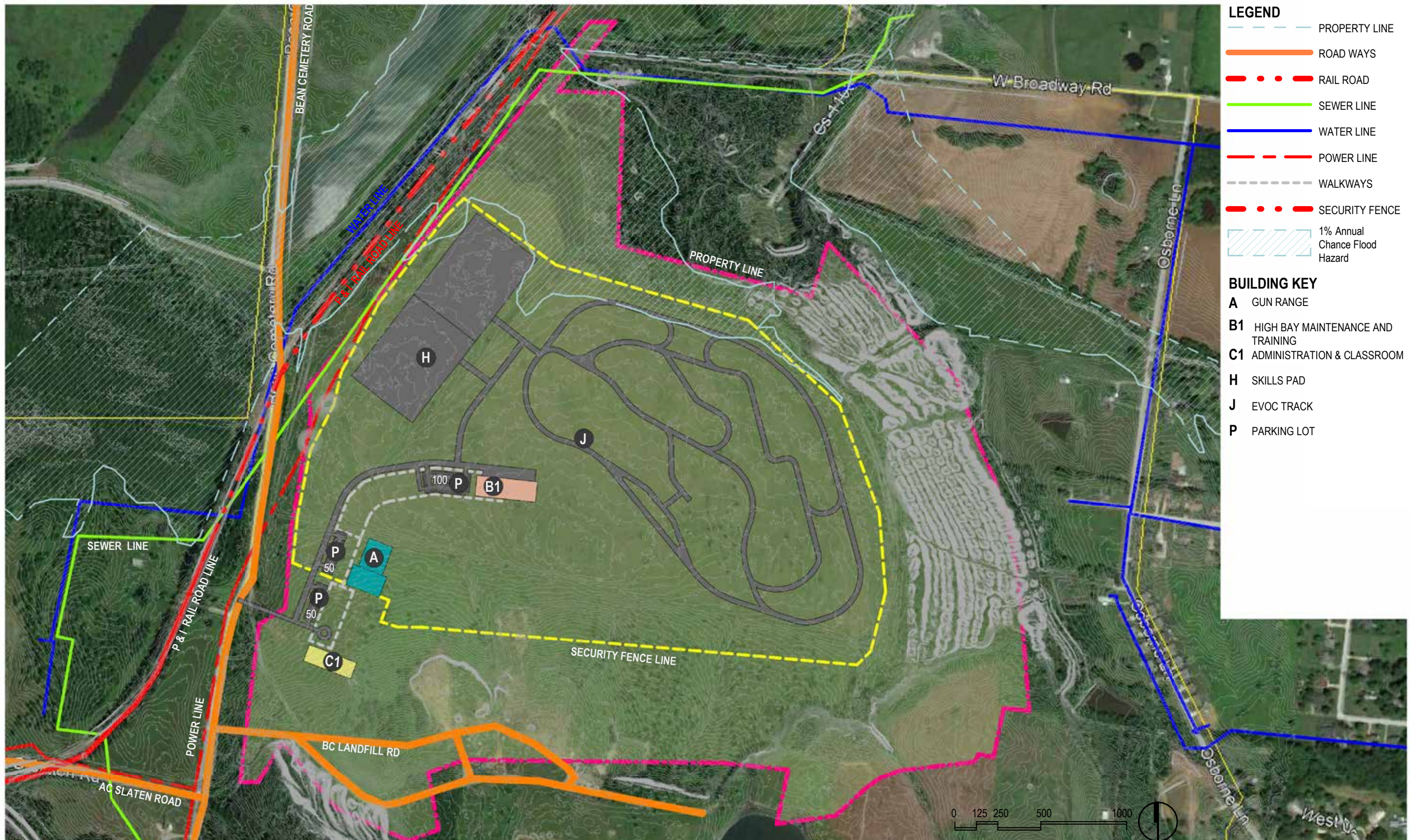
Driving a law enforcement vehicle in routine and emergency situations is a demanding task. The Emergency Vehicle Operator Course (EVOC) contemplated for the Western Kentucky Training Facility is approximately 2.55 miles with varying situations to suit the training scenario. There are varying roadway designs provided for emergency response applications, vehicle placement, skid control, passing and speed control to name a few. With the many available connections, the EVOC has a multitude of potential tracks for different and concurrent training opportunities.

To enhance training opportunities, vehicle maintenance and classroom functions are located directly adjacent to the EVOC to reduce travel time across the Training Site.

Site Elements

The site will also be provided with LED lighting appropriate for the venue and as required for security of the site. The site will also be provided with security cameras and controlled access.





- LEGEND**
- — — PROPERTY LINE
 - — — ROAD WAYS
 - · - · - RAIL ROAD
 - — — SEWER LINE
 - — — WATER LINE
 - - - - - POWER LINE
 - - - - - WALKWAYS
 - · - · - SECURITY FENCE
 - ▨ ▨ ▨ ▨ ▨ 1% Annual Chance Flood Hazard

- BUILDING KEY**
- A** GUN RANGE
 - B1** HIGH BAY MAINTENANCE AND TRAINING
 - C1** ADMINISTRATION & CLASSROOM
 - H** SKILLS PAD
 - J** EVOC TRACK
 - P** PARKING LOT

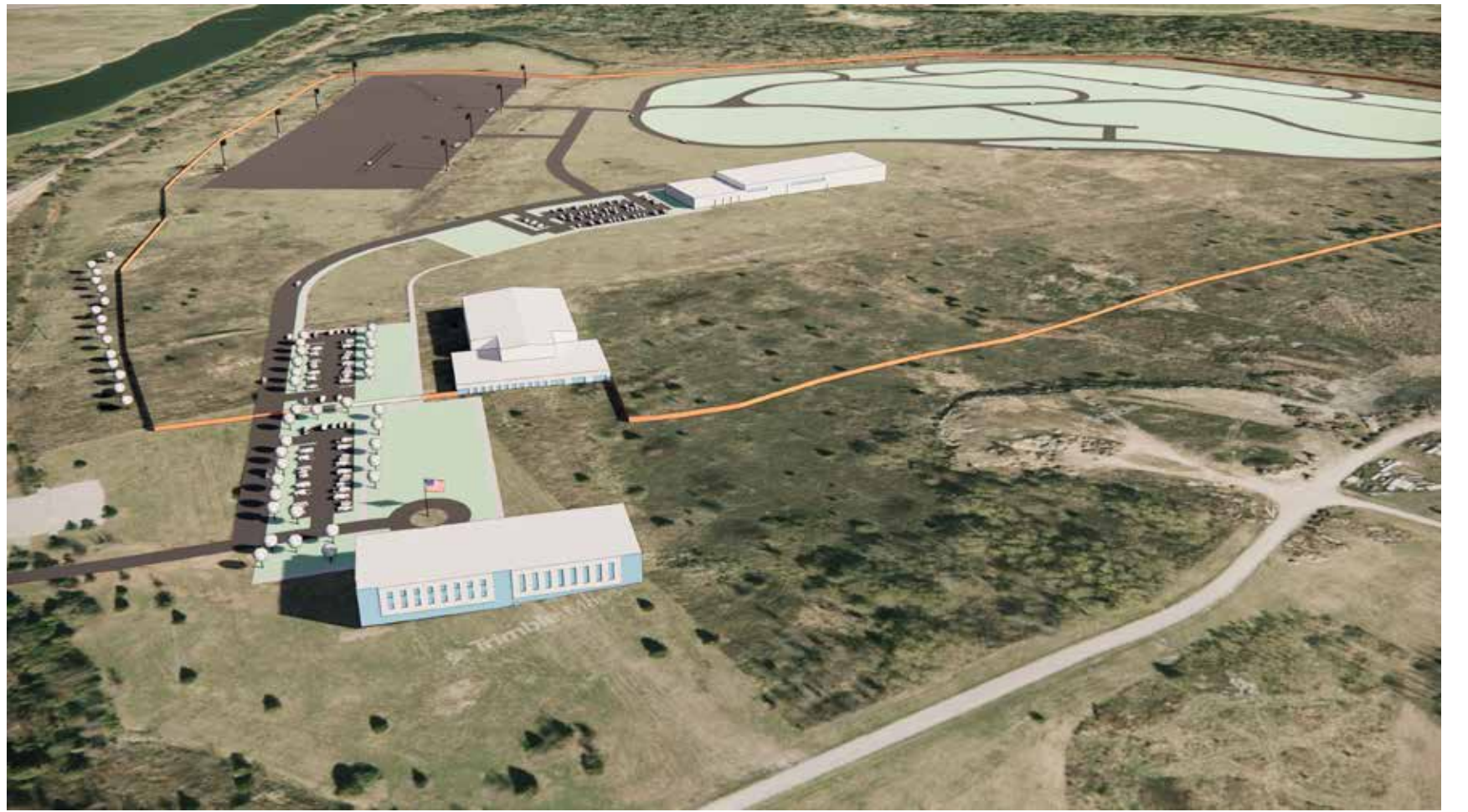
Proposed Project

Proposed project would encompass infrastructure work including access roads, site grading, security fencing and utilities into the site.

The building facilities to be included will be: the Administration and Classroom Building (with dedicated training mock call center and CJIS lab) and associated parking lot; the Indoor Shooting Range (30 lanes x 5 foot wide x 50 yards long) and accompanying parking lot; the High Bay Training & Maintenance (Simunitions Space, Vehicle Maintenance, Trailer Storage, Practical Applications Bays) including a parking lot for the training fleet vehicle parking.

Proposed project site training elements included are a vehicle skills pad (500'x1100'); EVOC Track (approximately 2 mile).







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