



# Joint Training Facility Expansion Study

City of Seattle - Finance and Administrative Services

December 2014





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**October 2014**

**City of Seattle – Finance and Administrative Services**

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<b>Project Stakeholders:</b>	Department of Finance & Administrative Services Seattle Fire Department Seattle Public Utilities



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## **1 PROJECT BACKGROUND**

**1.1** After over 10 years in use, Seattle Public Utilities (SPU), Seattle Fire Department (SFD), and City of Seattle's Finance and Administrative Services Department (FAS) have identified unmet needs at the Joint Training Facility (JTF), including a replacement parking lot and a second unpaved Dig Prop area. To address these unmet needs, this predesign study was undertaken to look at developing approximately 4 to 5 acres of City-owned property located immediately south of the current JTF site. This predesign study documents SPU's and SFD's programmatic needs that are currently not being met by the existing JTF site, develops options for accommodating these unmet needs on the JTF expansion site, and develops rough order of magnitude costs for these options.

## **2 ANALYSIS OF EXISTING CONDITIONS**

### **2.1 Overview**

According to King County records, the JTF site is 4.60 acres, and approximately 5.0 acres if SW Roxbury St is vacated. The rectilinear site is bound on the west side by the 2<sup>nd</sup> Ave SW street right-of-way, the north by the current JTF site, the east side by Myers Way SW, and the south by the partially vacated SW Roxbury right-of-way. The western property boundary is 177.87 ft, the northern boundary is 1,019.17 ft, and the eastern boundary is 218.87 ft. Starting at the southeast corner of the site and moving west, the southern boundary is 467.82 ft, then jogs north 30 ft, then west another 624.14 ft; the jog in the property line at the west end along the south edge represents the portion of SW Roxbury which hasn't been vacated.

### **2.2 Zoning**

The site is zoned C2-65. Adjacent zoning is as follows:

- West: LR-2 and C1-65
- North: C2-65
- East: C2-65
- South: C2-6

Structure Height: 65 ft

Floor Area Ratio (23.47A.013): 4.25 for lots solely occupied by residential or non-residential use. Portions of the lot

designated as a steep slope, wetland, riparian corridor, or shoreline habitat, or as a buffer to one of these areas, as defined in SMC 25.09, shall not be included when calculating lot size for the purpose of determining the minimum FAR requirement provided in subsection 23.47 A.013. HJU.1.

**Parking Access (23.47A032):** Access to off-street parking may be from a street or alley. When across the street from a residential zone, it shall meet the requirements for parking access for NC zones as provided in subsection 23.47A.032.A.1.

**Green Factor (23.86.019):** Green Factor score of 0.30 or greater required if development includes either a new structure or expansion of an existing structure greater than 4,000 sf of nonresidential uses, or parking lot containing more than 20 new parking spaces for automobiles.

**Street Improvements (23.53.015):** The wetland along the eastern edge of the expansion site may allow the Director to waive or modify the requirements for paving and drainage, dedication, setbacks, grading, landscaping, and curb installation.

**Landscaping and Screening (23.47A.016):**

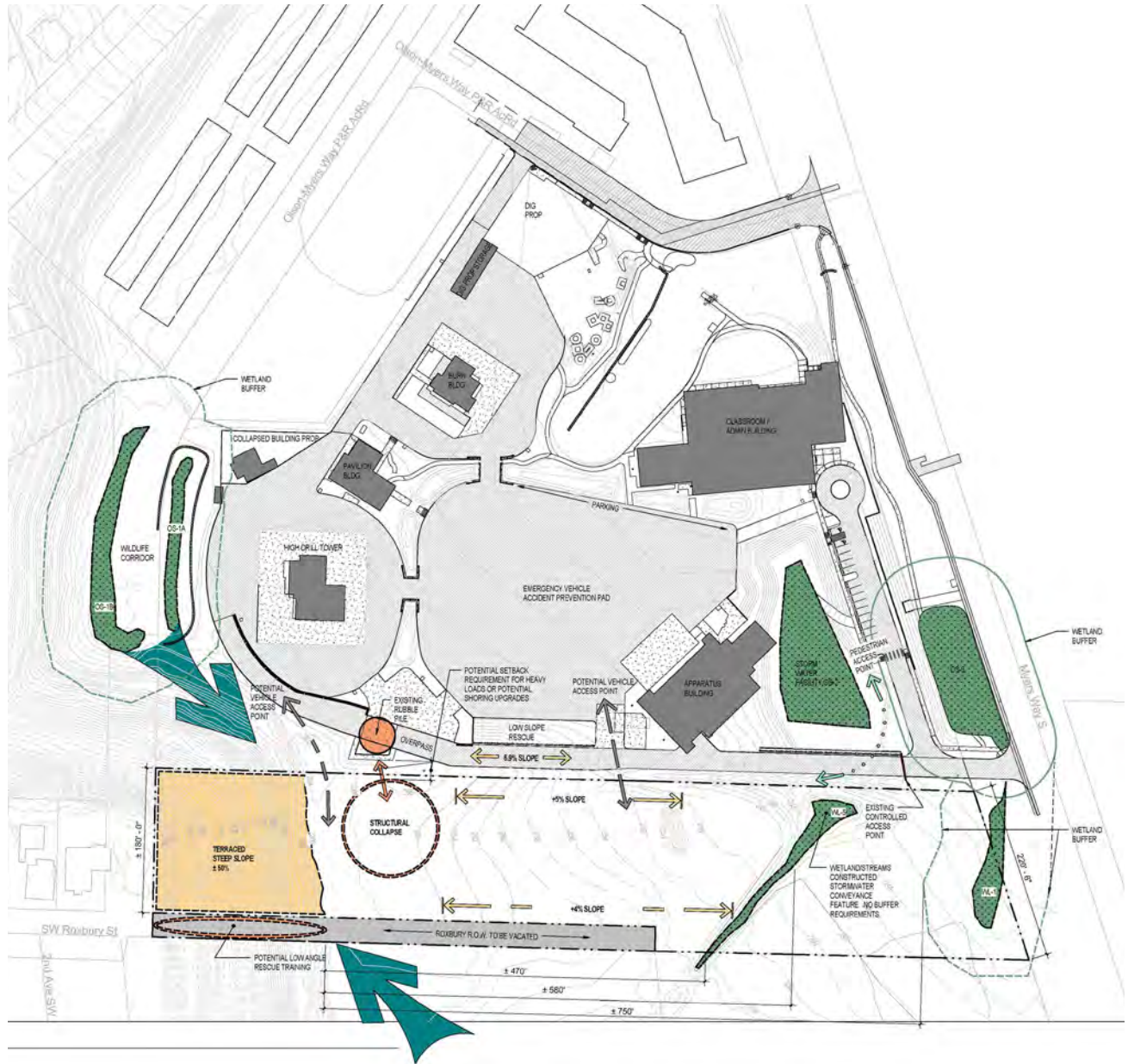
- Surface parking: 20-50 stalls – 18 sf/parking space; 51-99, 25 sf/parking space; 100 or more, 35 sf/parking space.
- Landscaped areas shall be no smaller than 100 sf and must be enclosed by permanent curbs or structural barriers.
- No part of landscaped area shall be less than 4 ft in width or length.
- No parking space shall be more than 60 ft from a required landscaped area.
- 1 tree per 10 stalls
- 3 ft high screening required along street lot lines

**Outdoor Activities (23.47A.011):** No size limits for Outdoor Sales, Outdoor Display of Rental Equipment, or Outdoor Storage. Screening required for outdoor storage when across the street from a lot in a residential zone, in the form of the façade of a structure or by 6-foot-high screening

The City of Seattle Environmental Critical Areas (ECA) map indicates “Steep Slope” through the middle third of the site, while the conditions within the indicated area do not currently



meet the criteria for a steep slope. Upon review of a 1936 aerial photo of the site on King County’s website, we believe this “Steep Slope” outline is based on the former topography of the site, prior to its use as a gravel quarry. The current site slopes west to east, with a relatively steep grade in the neighborhood of 50% at the west edge, which does meet the criteria for a “steep slope”, while the middle section of the site



Site Analysis Diagram

slopes 4% to 8%.

### 2.3 Site Planning Analysis

The developable area of this long linear site is bound on the west side by the steep slope on the west end of the site and

the 2 wetland areas at the east end of the site for a contiguous area of approximately 2.57 acres. This area moderately slopes to the east at about a 9% grade along the north property line and about a 4% grade along the south property line. There is another triangular piece of developable land between the 2 wetlands that is approximately 0.9 acres in size.

Vehicular access between the existing JTF site and the expansion site could occur as an extension, or a spur off of the curved roadway that currently serves as the western access to the Overpass Prop. Another logical access point would be aligned with the southern egress of the EVIP pad.

There is a desire to have a pedestrian access point on the eastern side of the site to allow closer access from parking to the JTF public entrance.

Initial research indicates the potential of filling the linear wetland located on site, Wetland 5/Stream 5, which would join the two developable portions of the site for a combined developable area of 3.47 acres.

## **2.4 Geotechnical Analysis**

**2.4.1** The following text sections of this report present our preliminary geotechnical conclusions and recommendations project feasibility, site preparation, foundations, utilities, pavements, and structural fill. American Society for Testing and Materials (ASTM) specification codes cited herein refer to the current ASTM manual. Washington State Department of Transportation (WSDOT) specification codes cited herein refer to current WSDOT publication M41-10, Standard Specifications for Road, Bridge, and Municipal Construction.

### **2.4.2 Project Feasibility**

No significant geotechnical issues were identified within the subject parcel during our study. Based upon our preliminary analysis, the site appears suitable from an apparent “fatal flaws” for development of the proposed JTF Expansion project. However, due to the presence of existing fill, substantial earthwork to adequately prepare the subgrade soils may be required for the anticipated development, depending upon final grades. Earthwork activities which intercept the groundwater table will present additional challenges.

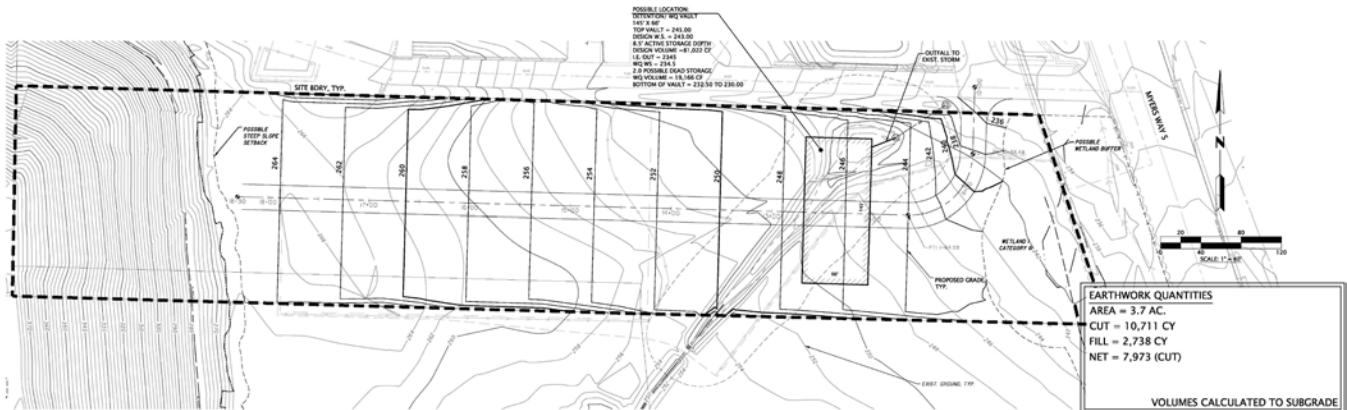
### 2.4.3 Critical Areas Considerations

Steep, man-made cut slopes on the northwestern corner of the site range in height up to 20 feet and descend at an inclination of about 57 percent. Steep man-made fill slopes occur along the east half of the southern property boundary. These slopes approach heights of 15 feet and descend to the south at 2H:1V (Horizontal: Vertical), about 50 percent. Once locations of structures are finalized, we can determine the need for additional study, if necessary. Evaluation of the steep slopes and recommended buffers would be included in the final geotechnical report.

### 2.4.4 Stormwater Infiltration

Based upon results of our subsurface exploration program and laboratory testing, stormwater infiltration appears feasible at the site within the advance outwash sand deposits. However, a limiting factor would be the relatively shallow groundwater levels on the east side of the site. Provided grades will allow discharge elevations at least 5 feet above the observed groundwater levels, then infiltration could be feasible.

## 2.5 Civil Analysis



Conceptual Grading Plan if Wetland/Stream 5 is Infilled

### 2.51 Site topography and drainage

The JTF expansion site is 5.0 acres (including the SW Roxbury ROW) immediately south of the existing JTF facility. The western quarter of the site (1.0 acres) consists of an engineered benched slope which falls east from a top at the termination of improved SW Roxbury Street at a grade of >50% to a defined toe. The middle half of the site (2.6 acres) slopes east from the defined toe at a general grade of 4.0% to the top of a ditch which has been identified as Stream/Wetland #5. . The eastern quarter of the site (1.4 acres) contains

Stream/Wetland #5 and Wetland #1 located at the eastern site boundary at Myers Way S. An existing gravel pad (+-0.5 acres) lies between these wetland features.

Stream/Wetland #5 outfalls to a 12" culvert which conveys storm and ground water northeast to a piped conveyance constructed with the original JTF. Wetland 1 overflows are conveyed northwest in storm pipe to the same JTF system. Site drainage along with existing JTF controlled storm drainage and constructed wetland overflows are directed off-site, east under Myers Way South.

All site drainage is within the Durham Creek/Duwamish River drainage basin.

## **2.52 Site access**

The existing JTF site is accessed at the southeast corner of the facility from Myers Way S. Vehicles enter the site and either turn right/north to a parking lot which is parallel to Myers Way South or continue west through a secure gate and travel along the south boundary. This access is identified as the "Rim Road" on JTF design plans. The JTF expansion can be accessed from the Rim Road at locations within the secure fence which do not conflict with existing drainage bio-filtration swales.

## **2.53 Site water and sewer utilities**

Domestic water to the existing JTF site is provided from a meter located mid frontage at the right-of-way of Myers Way S. The existing distribution line is noted as 2-inch diameter on JTF construction plans. The nearest domestic water location to the proposed expansion is the northeast corner of the existing Apparatus Building. Extension of this 2-inch line to the facilities proposed for the expansion area will not likely provide required flow and pressure due to friction losses in the line. A 12-inch water line exists in Myers Way S. at the intersection with the Rim Road. Domestic water can be extended to the expansion site from this point.

Gravity sanitary sewer is networked throughout the existing JTF facility within 8-inch diameter pipe. The nearest sanitary sewer line to the proposed expansion site is just west of the existing Apparatus Building. Sanitary sewer can be extended to the expansion facilities from this point.

## **2.54 Site power and communications**

The existing JTF facility electrical service room and telecom room are located at the southwest side of the existing Apparatus Building. It is assumed that expansion electrical and communication facilities will be metered and coordinated from this location.

Natural gas is located within the western margin of Myers Way South and is distributed to facilities within the existing JTF site. The nearest point of gas distribution is at the southwest corner of the Apparatus Building. Natural gas can be extended to the expansion site from this point.

## **2.6 Environmental Analysis**

### **2.6.1 Background**

#### Previous Field Investigations

##### *On-site Areas*

Raedeke Associated, Inc. (2011) previously identified Wetland 1 and Wetland 5/Stream 5 within the JTF Expansion Studies project area during site investigations of the property conducted during spring 2011. These wetlands are located within an area that was quarried for sand and gravel until the 1990's (City of Seattle 1986, 1991). Mine reclamation activities continued until 2001 (City of Seattle 2001).

##### *Off-site Areas*

Raedeke Associates, Inc. (2011) also identified two off-site wetlands, Off-site Wetland 1 (OS-1) and Off-site Wetland 2 (OS-2), within the current JTF property that are located near the north boundary of the JTF Expansion Studies project area and whose buffers may extend into the project area. As-built construction documents for wetland mitigation provided for construction of the current JTF site indicate that a third off-site area near the project site north boundary, identified by Raedeke Associates, Inc. (2011) as Off-site Wetland 2 (OS-2), had been converted to a stormwater facility to serve the JTF property and was fully mitigated under a U.S. Army Corps of Engineers (COE) permit for that project (AMEC 2008).

#### Current Site Conditions

Raedeke Associates, Inc. visited the City of Seattle Joint Training Facility (JTF) Expansion project area on September



30, 2014 to document existing conditions within wetlands and streams previously identified and delineated by our staff during spring 2011 for the City of Seattle Department of Finance and Administrative Services. As part of our effort, we updated wetland ratings for Wetland 1 and Wetland 5/Stream 5 and the offsite wetlands OS-1 and OS-2 using the Washington Department of Ecology's (WDOE) Wetland Rating System for Western Washington (Hruby 2004, as revised 2006, and WDOE 2008) as required under SMC 25.09 (City of Seattle 2014) for determination of wetland buffer widths.

During our site investigation, we determined that off-site wetland OS-1 was actually two separate wetlands, wetlands OS-1A and OS-1B. We also determined that the extent of off-site wetland OS-3 did not encompass a large area to the north of an access road that had previously been included for evaluation of the wetland rating.

Conditions within Wetland 1 are unchanged from our previous study (Raedeke Associates, Inc. 2011) and the wetland meets criteria to be regulated as Category III under the WDOE Wetland Rating System for Western Washington (Hruby 2004, as revised 2006, and WDOE 2008). Off-site wetland OS-1A meets criteria to be regulated Category IV and off-site wetlands OS-1B and OS-3 meet criteria to be regulated as Category III under the WDOE Wetland Rating System for Western Washington (Hruby 2004, as revised 2006, and WDOE 2008).

#### Regulatory Implications

##### *U.S. Army Corps of Engineers Jurisdictional Determination*

Following a request by the City of Seattle to the U.S. Army Corps of Engineers (COE) to verify the jurisdictional limits of waters of the U.S. within the property, the COE determined that Wetland 1, Wetland 5/Stream 5 were waters of the United States and subject to regulation by the COE (2012). The jurisdictional determination is valid for a period of five years from the September 25, 2012 date of issuance by the COE (2012). Impacts to Wetland 1 or Wetland 5/Stream 5 will require issuance of a federal Clean Water Act Section 404 permit.

##### *Washington Department of Ecology Jurisdiction*

The Washington Department of Ecology (2013) will regulate



Wetland 1 and Wetland 5/Stream 5 under Section 401 of the federal Clean Water Act. Impacts to Wetland 1 or Wetland 5/Stream 5 will require a Section 401 Water Quality Certification

*Washington Department of Fish and Wildlife Jurisdiction*

Raedeke Associates, Inc. contacted the Washington Department Fish and Wildlife (WDFW) regarding jurisdiction Washington State jurisdiction over Wetland 5/Stream 5 under the State Hydraulic Code (RCW 75.20.100-140). The WDFW (2014) has preliminarily determined that Wetland 5 would not be regulated under RCW 75.20.100-140 because it is artificial.

*City of Seattle Jurisdiction*

Raedeke Associates, Inc. contacted the City of Seattle Department of Planning and Development regarding jurisdiction over Wetlands 1 and 5 under chapter 25.09 (Environmentally Critical Areas) of the Seattle Municipal Code (SMC).

The City of Seattle (2013) has preliminarily determined that Wetland 1 meets criteria to be regulated under SMC 25.09 and that Wetland 5/Stream 5, which is within a drainage ditch that was constructed as part of a site drainage facility to convey stormwater out of the property (City of Seattle 1986, WDOE 2007), would not be regulated under SMC 25.09 because it was constructed to serve as site stormwater facilities.

Wetland Rating and Buffer Widths

<b>Wetland</b>	<b>WDOE Rating (Total Score)</b>	<b>Regulated by COE</b>	<b>Regulated by WDOE</b>	<b>Regulated by WDFW</b>	<b>Regulated by City of Seattle</b>	<b>City of Seattle Standard Buffer (ft)</b>
1	III (31)	YES	YES	N/A	YES	60
5	IV (20)	YES	YES	NO	NO	NA
OS-1A	IV(17)	YES	YES	N/A	YES	50
OS-1B	III (42)	YES	YES	N/A	YES	60
OS-3	III(41)	YES	YES	N/A	YES	60

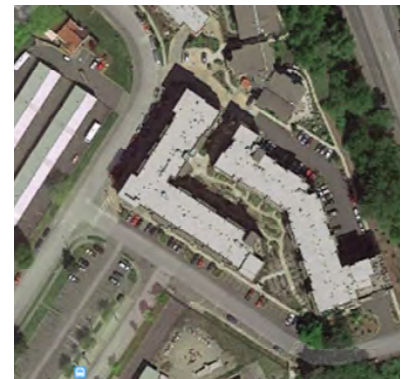
### **3 PROGRAM / SPACE NEEDS**

#### **3.1 Program / Space Needs Overview**

Separate programming meetings were held with SFD stakeholders and SPU stakeholders to develop an understanding of each department’s current use of the JTF site, the shortcomings they experience with the current site, and determine what their current and longer terms needs are. Questionnaires were distributed to the stakeholders to help seed the discussions during the programming meetings. Responses to the questionnaires were limited, but most of the needed information was provided during the programming meetings, site walkthroughs, and subsequent emails.

##### **3.1.1 Parking Program (SFD and SPU)**

The City currently has a shared parking agreement with Arrowhead Gardens, a senior living development to the north of the JTF site. This agreement allows JTF to use 80 stalls in their parking lot, but there are rarely more than 50 available due to high residence usage. Proximity of this parking lot to the JTF is less than desirable, and it doesn’t address the parking needs of staff arriving to the site driving City vehicles, such as vactor trucks, fire apparatus, dump trucks, and other large work-related vehicles. Closer adjacency of parking to training activities is necessary, as sometimes staff in training need quick access to their City vehicles in order to respond to emergency calls. This requirement is tied to response times associated with their duties. In addition, security is a concern for these vehicles, as many are carrying expensive equipment. Much of the large vehicle parking is currently accommodated within the right-of-way along Myers Way South, in front of the JTF.



*Arrowhead Gardens Parking*

The existing JTF site has 28 marked passenger vehicles stalls at the north perimeter of the EVIP pad and 18 marked passenger stalls in the visitor lot. It is estimated that Myers Way South can accommodate around 50 vehicles when parked on both sides of the right-of-way.

SFD parking needs include the following:

- 6 apparatus; 4 engines and 2 ladder companies for on-duty training



*Parking for SPU meeting*

- Up to 5 engines, 2 trucks, and 5 SUVs for vehicles to be used in training activities (so parking of these vehicles can occur on EVIP pad)

SPU parking needs include the following:

- Recruiting events that can draw up to 250 vehicles;
- 100 – 200 vehicles every few month for events;
- Secure lot because vehicles carry expensive tools/equipment;
- General parking need is 2/3rds truck of various sizes (pickup trucks to 40 ft tractor trucks) and 1/3<sup>rd</sup> passenger vehicles



*Parking for Open House event*

The Expansion site is envisioned as an area that could accommodate this parking need, replacing in part the 80 stalls currently shared with Arrowhead Gardens. The thought is that it could function as a Multi-Functional Paved Area, similar to the current EVIP pad at the JTF. Other potential uses identified for this multi-functional paved area include SPU and SFD driver training, helicopter pad, special events such as recruitment fairs and open-house demonstrations, Urban Search and Rescue (USAR) training (setting up and working out of tractor trailers as mobile command headquarters), and any other various trainings (mass casualty hazmat mobilization training). Ideally, the parking component would be located near the main reception at the Classroom Training Building, as visitors are required to report there first.

### **3.1.2 Heavy Drill Court Program (SFD)**

Aerial Tiller / Tractor-Drawn Aerial Training will continue to occur on the EVIP. The expansion site is envisioned accommodating the need for a Heavy Drill Court, which could accommodate a variety of activities including Structural Collapse and Rescue Training area, Metal Cutting Area, Tower Crane Rescue, Low-slope Rescue, and Ground-level Cutting Props. The general requirements for these activities are as follows:

Structural Collapse and Rescue Training:

- Dedicated prop area located directly adjacent to the existing overpass area, so the depression under the overpass can be used for basement training;



*Existing Overpass and Rubble Pile Prop*

- 100 ft x 100 ft concrete pad for a rubble pile that is sloped to sheet water off;
- 20 ft high concrete wall in L-shape with legs of 25 ft and 35 ft that would allow them to lean props against;
- 2-3 hose bibs with capacity to supply water at the rate of 8 gal/min;
- Power (230 V, (8) 110 V 20 AMP circuits;
- Compact, stable soil;
- Access for semi-trucks and large cranes to set up props;
- Ground bearing capacity to support 90-300 ton cranes;
- Relocation of Structural Collapse Training to the expansion site's Heavy Drill Court would free up the existing Collapse building to be repurposed to potentially accommodate multiple 40 ft containers stacked behind it to simulate a multi-level structure.



*Existing Structural Collapse Prop*

#### Metal Cutting Area:

- 50 ft x 100 ft

#### Tower Crane Rescue:

- 30 ft high tower with cab and boom, or
- (3) 10 ft sections of tower crane.

#### Low-Slope Rescue

- Adjacency to the steep hillside on the west side of the site to allow for low-slope rescue training. This would also require deadman anchors at the top of the slope accessed at the end of SW Roxbury St, as well as room at the top of the hill for SFD vehicles.

#### Ground-level Cutting Props:

- Flat-roof prop 40 ft x 40 ft;
- Pitched-roof prop 20 ft x 20 ft;
- Permanent structure constructed with treated lumber and plywood sheathing.



Current SPU Training Props in Classroom

### 3.1.3 Classroom Building Program (SFD)

Another “Dirty” Classroom Building is envisioned to be adjacent to the Heavy Drill Court, which would accommodate the following:

- Indoor classroom for 24 students and 6 instructors, similar in size to the existing Classroom #5;
- Adjacent covered outdoor classroom of equal size;
- Covered outdoor storage of similar size;
- Height similar to the backside of the existing Pavilion Building;
- Bathroom facilities with shower;
- Outdoor decontamination shower.

### 3.1.4 Driver Training Program

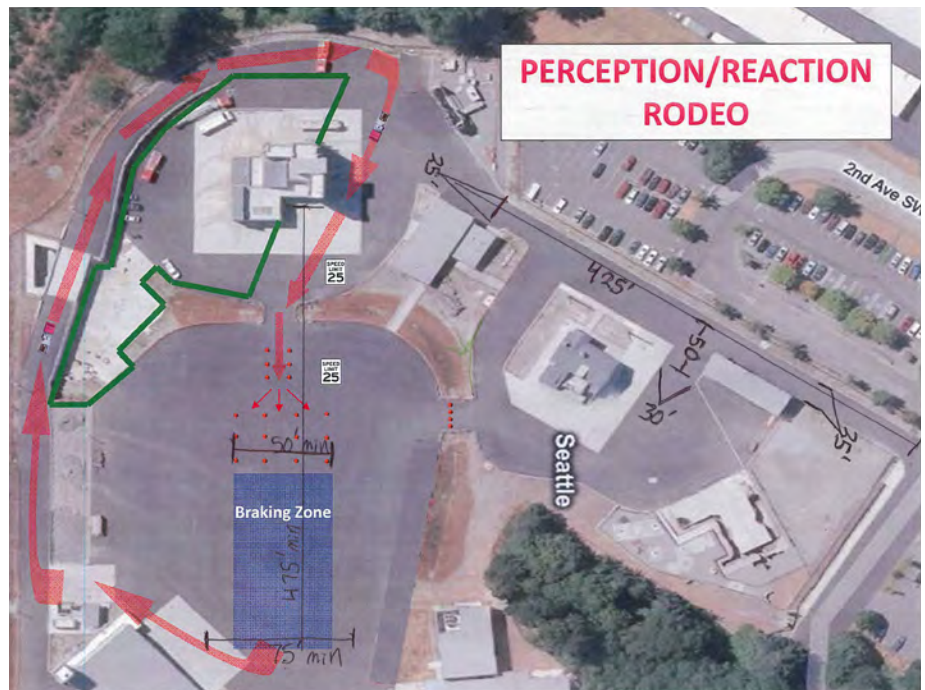


Diagram of existing JTF site and current driver training use/needs

Driver training currently occurs mainly on the EVIP pad. Drivers enter through the throat at the east side of the High Drill Tower pad, then use the first half of the of the EVIP to accelerate the vehicle up to 25 mph, then the second half of the EVIP to perform the maneuver. The second half needs to be 3 lanes wide (60 ft) to perform avoidance maneuvers. Additional space at either ends is needed to align and maneuver the vehicles. The instructor is positioned on the pavement, visible to the driver, and gives commands to the



driver. This hasn't been an issue, but brings up a potential safety concern. Other drills such as dog-leg backing can also occur in this area. Programming issues that arise with the current EVIP pad is that when driver training is occurring, most other training activities cannot occur because the trucks are using the perimeter roadways for circulation, which cuts off access to other prop areas.

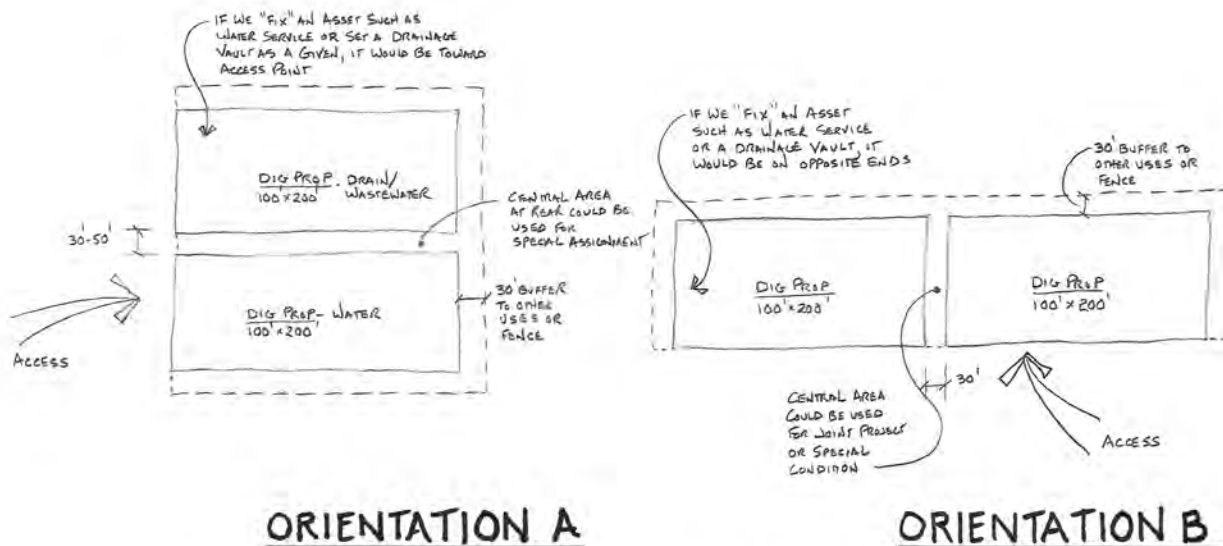
If SPU were to pursue offering CDL training, there would be a desire to have a course with more defined corners and intersections, as traffic cones are hard to see.

As noted under Parking Program, the Multi Functional Paved area could potentially accommodate this need, depending on the length and width.

### 3.1.5 Dig Prop – Live Trenching Program (SFD and SPU)

This would be an unpaved area that would be used to practice trench training. 10-12 ft deep trenches up to 20 ft long would be dug, with potential intersecting trenches. Backhoe and excavator access will be required for rebuilding trenches. This area would also accommodate a slope shoring prop 6 ft high x 14 ft long x 8 ft wide on a slope.

### 3.1.6 Dig Prop Area Program (SPU)



## JTF DIG PROP STUDY

20 AUG 2014 SPACE STUDY - SPU DRAIN/WASTE WATER & WATER

Options for orientation of Drainage/Wastewater and Water Dig Props - Provided by SPU



The intent of the Dig Prop area is to replicate real world situation as best as they can accommodate on a limited site. This includes the setting (being able to park trucks and equipment adjacent to dig area) as well as preparation to go to a site (bringing appropriate equipment, materials, and tools).

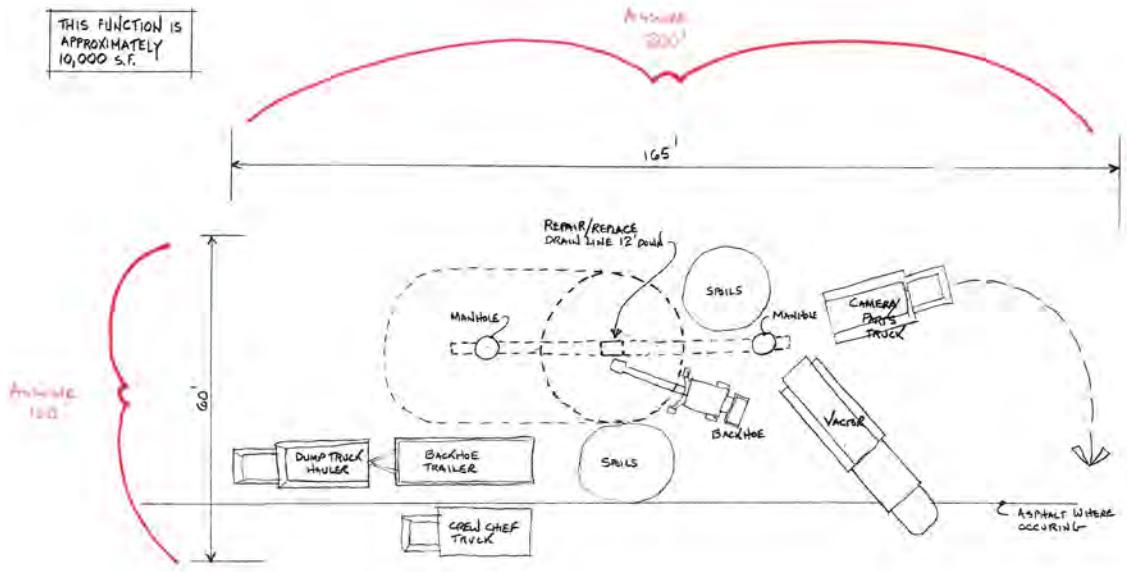
Activities that occur at the Dig Prop area include:

- Digging/Laying/Repairing pipe;
- Installing and repairing hydrants;
- Charging mains and hydrants (City will be installing potable water supply to existing Dig Prop area, which is currently served by “purple pipe”);
- Maintenance for manholes;
- Room to accommodate a vactor truck, dump truck, parts truck, and a crane for setting vaults (crane will be brought to site when needed, not stored on site);
- Backhoe training does not currently occur on this site, but there is interest for Heavy Equipment training in the near future;
- This area should not be shared with SFD’s metal cutting area, as the sharp debris from metal cutting activities present a hazard for digging activities, and the metal debris interferes with locate training;
- Currently, large training props such as vaults and pipe are acquired from the warehouse and delivered to the site. The advantage of this is it allows training for loading and unloading of materials. In the future, in the interest of efficiency, storage of some standard drainage and wastewater materials such as pipe lengths, valves, catch basins, manholes, thrustblocks, etc. is desired to be on site under covered storage.

SPU has two training programs, one for water pipe workers and the other for drainage and waste water collection. Training group size are around 30, split into two groups of 13-16. Each group is then subdivided into 3 smaller groups, which rotate between the classroom and dig prop area.

The current location of the Dig Prop is consider good, with good adjacencies to manholes, vaults, pre-cast trench operations, and storage bins.

THIS FUNCTION IS APPROXIMATELY 10,000 S.F.



**ASSUMPTIONS**

1. THIS DIG AREA MAY WANT TO HAVE ESTABLISHED MANHOLE & DEEP DRAIN TO PRACTICE EXCAVATION & REPAIR & CLEANING PROCEDURES
2. ACCESS CIRCULATION AS MAY BE NEEDED IS NOT INCLUDED
3. SETBACKS TO OTHER USES OR FOR SAFETY ARE NOT INCLUDED

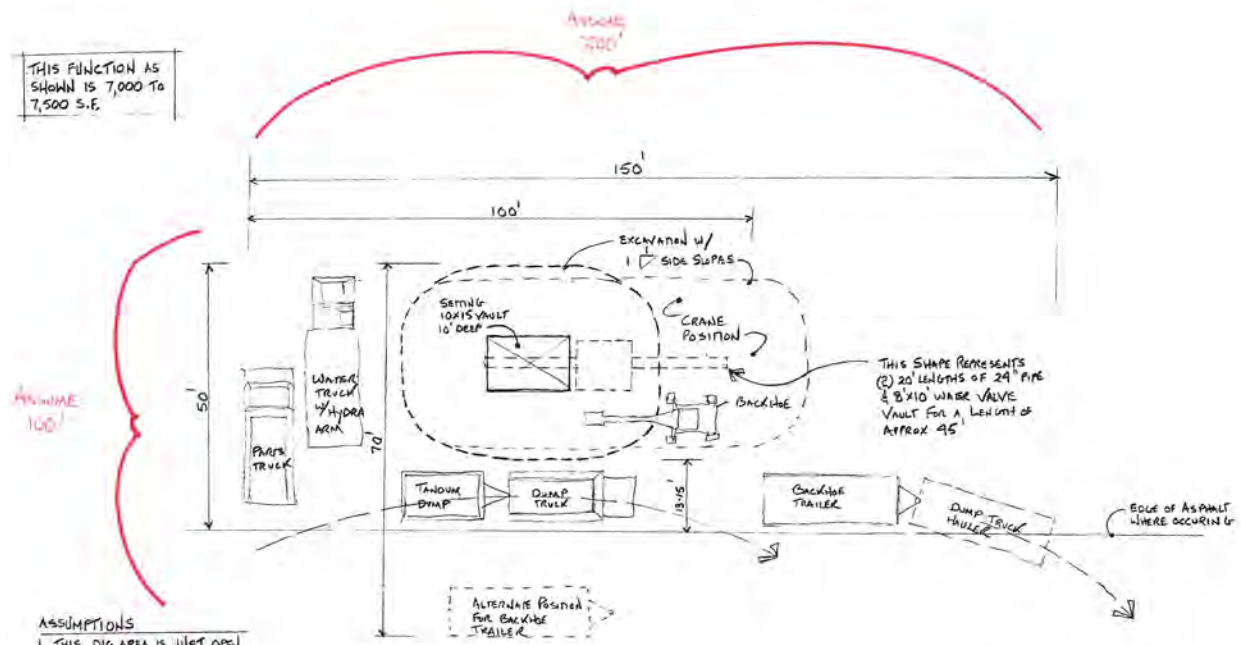
8/14/2014

**DIG PROP POSSIBILITY**

DRAINAGE & WASTEWATER REPAIR

Diagram illustrating Space Needs for Drainage/Wastewater Prop - Provided by SPU

THIS FUNCTION AS SHOWN IS 7,000 TO 7,500 S.F.



**ASSUMPTIONS**

1. THIS DIG AREA IS JUST OPEN GROUND ACCESSED OFF ASPHALT
2. ACCESS CIRCULATION AS MAY BE NEEDED IS NOT INCLUDED
3. SETBACKS TO ADJOINING USES OR FOR SAFETY ARE NOT INCLUDED

8/13/2014

**DIG PROP POSSIBILITY**

WATER VAULT INSTALLATION

Diagram illustrating Space Needs for Water Vault Prop - Provided by SPU

### 3.1.7 Storage Area Program (SPU)

Existing storage for SPU training activities is scattered about the JTF campus. Locating storage adjacent to where supplies are being used would obviously create more efficiencies, and reduce conflicts with other training activities on site.



*Current Material Storage is open, causing contamination issues*

Existing storage includes the following:

- Small (~200 sf) dry storage room in Classroom Building used for miscellaneous supplies;
- Covered materials storage structure (~1,600 sf) adjacent to existing Dig Prop, with 5 bays divided with ecology blocks stacked 3 high. Storage of miscellaneous materials occur in 4 of the 5 bays, including lumber, barricades, pallets, and pipe. The 5th bay is used for sand storage, which is used for testing purposes. Ideally, the walls around the sand storage would be higher to prevent wind driven rain from saturating the sand, and to keep volunteer vegetation from taking root in the sand;
- ~12 ft x 12 ft portable metal storage container currently located on the back side of the covered storage structure that is used for temporary storage. Access to this is sometimes blocked by other materials being stored adjacent to it;
- ~200 sf enclosed storage room at the Pavilion Building that contains traffic cones and other miscellaneous materials;
- ~100 sf storage area on the backside of the Pavilion Building enclosed with chainlink for storage of testing props;
- Sheltered storage space is needed adjacent to a covered area that would be used for candidate physical screening.

### 3.2 Space Needs

No	Program Space	Dimensions		Space Need	Remarks	OPTIONS								
		L	W			1	2	3	4	5	6	7		
1	Parking			82,800	Assumes double loaded layout with minimal buffering									
2	Driver Training - Perception	475	75	35,625	Requires a loop road and maneuvering space at both ends									
3	Driver Training - Dog-leg Backup	425	50	21,250	Requires a loop road and maneuvering space at both ends									
4	Structural Collapse / Rescue	100	100	10,000										
5	Metal Cutting	100	50	5,000										
6	Tower Crane Rescue			-	Could be collocated on the Structural Collapse pad	Assume collocated on Structural Collapse pad								
7	Low Slope Rescue	150	60	9,000	Approx size of existing prop									
8	Ground-level Cutting Props	60	40	2,400	Requires additional circulation space around prop									
9	Dig Prop - Trenching	40	40	1,600										
10	Dig Prop - Water	150	70	10,500	Requires additional access circulation and safety setback (30 ft) from adjacent uses									
11	Dig Prop - Drainage/Wastewater	165	70	11,550	Requires additional access circulation and safety setback (30 ft) from adjacent uses									
12	Dig Prop - Environmental	80	50	4,000	Requires additional circulation space around prop									
13	Classroom (Indr/Outdr)	100	46	4,600										
14	Dig Prop Storage	85	24	2,040										
15	Testing Prop Storage	20	12	240										
16	<b>SFD Storage</b>			<b>2,500</b>										
<b>TOTAL</b>				<b>203,105</b>										

## **4 SITE LAYOUT OPTIONS**

### **4.1 Overview**

The previous section, Section 3.2 - Space Needs, identifies a net square footage need of approximately 200,000 SF, which is approximately 4.60 acres. The overall size of the JTF expansion site is 5 acres including the vacated SW Roxbury right-of-way, with only about 3.47 acres being developable, and of that 3.47 acres, the largest contiguous portion is 2.57 acres. Given the deficit of available developable land on the expansion site, a prioritization of the City's needs was required

The following Preliminary Options were meant to test the various programming space needs, to explore any synergies that could be realized through adjacent uses, and possible impact reprogramming of other parts of the existing JTF site might have on the overall programming / space needs.

These Preliminary Options were reviewed by the project stakeholders, and from the 7 options presented 2 were chosen as the Preferred Options for further refinement and cost modelling.

### **4.2 Preliminary Options**

#### **4.2.1 Option 1**

Option 1 focuses development within the 2.57 acres of contiguous developable land on the expansion site. Vehicular access Y's off of the western approach to the existing overpass, then continues south along the toe of the slope to the vacated SW Roxbury right-of-way, then continues south along the property line, turning north again at the west edge of Wetland 5, then connecting with the southern perimeter road for the JTF.

The Wastewater/Drainage and Trenching Dig Props are cut into the hillside to the west, on the west side of the vehicular roadway.

The Structural Collapse Prop is situated directly adjacent to the existing "Pit" at the overpass, allowing it to be used for basement rescue / extraction. Directly south is the Metal Cutting Prop area.

To the east of the Structural Collapse and Metal Cutting Prop areas is the Classroom Building and Storage. This central location gives the Classroom Building good orientation

towards the prop areas to enhance learning opportunities.

This option assumes that the Water Dig Prop remains on the existing JTF site.

To the east of this area is the Multi-Functional Paved Area that can accommodate up to 167 passenger vehicles.

#### Pros

- Provides good adjacency between Structural Collapse Prop and existing overpass “Pit”;
- Classroom Building location overlooks prop areas for enhanced learning.

#### Cons

- Drainage/Wastewater and Trenching Prop areas will require significant retaining walls and groundwater mitigation;
- Doesn't accommodate Environmental Dig Prop on expansion site;
- Doesn't accommodate EVIP/Driver Training program on expansion site;
- Doesn't accommodate Ground-level Cutting Prop on expansion site;
- Doesn't accommodate Low Slope Rescue training.
- Impacts to wildlife corridor.

### **4.2.2 Option 2**

Option 2 focuses development within the 2.57 acres of contiguous developable land on the expansion site. Vehicular access Y's off of the western approach to the existing overpass, then continues south along the toe of the slope to the vacated SW Roxbury right-of-way, then continues south along the property line, turning north again at the west edge of Wetland 5, then connecting with the southern perimeter road for the JTF.

The Classroom Building and Storage are cut into the hillside to the west, on the west side of the vehicular roadway. This allows the Classroom Building to look out over the Structural Collapse and Metal Cutting Prop areas.

The Structural Collapse Prop is situated directly adjacent to the existing “Pit” at the overpass, allow it to be used for basement rescue / extraction. The Metal Cutting Prop area is located directly south of the Structural Collapse Prop.



To the east of the Structural Collapse and Metal Cutting Prop areas are the Drainage/Wastewater Prop area, running in a north-south linear orientation.

To the east of the Dig Prop area is the Multi-Functional Paved area, which can accommodate up to 167 passenger vehicles.

This option assumes that the Water Dig Prop remains on the existing JTF site.

#### Pros

- Provides good adjacency between Structural Collapse Prop and existing overpass “Pit”;
- Confines Development within the contiguous part of the site.

#### Cons

- Cutting into the hillside for the Classroom Building and Storage area will required significant retaining walls and groundwater mitigation;
- Trenching Dig Prop not accommodated on expansion site;
- Environmental Dig Prop not accommodated on expansion site;
- Ground-level Cutting Prop not accommodated on expansion site;
- Doesn’t accommodate EVIP/Driver Training program on expansion site;
- Doesn’t accommodate Low Slope Rescue training.
- Impacts to wildlife corridor.

### **4.2.3 Option 3**

Option 3 focuses development within the 2.57 acres of contiguous developable land on the expansion site. Vehicular access Y’s off of the western approach to the existing overpass, then continues south along the toe of the slope to the vacated SW Roxbury right-of-way, then continues south along the property line, turning north again at the west edge of Wetland 5, then connecting with the southern perimeter road for the JTF.

The Ground-level Cutting Prop, Trenching Dig Prop, and Storage are cut into the hillside to the west, on the west side of the vehicular roadway.

The Structural Collapse Prop is situated directly adjacent to the existing “Pit” at the overpass, allow it to be used for basement

rescue / extraction. The Metal Cutting Prop area is located directly south of the Structural Collapse Prop.

To the east of the Structural Collapse and Metal Cutting Prop areas is the Drainage/Wastewater Dig Prop area, running in a north-south linear orientation.

To the east of the Dig Prop area is the Multi-Functional Paved area, which can accommodate up to 129 passenger vehicles. To the south of the Multi-functional Paved area is the Classroom Building. This option assumes the Water Dig Prop remains on the existing JTF site.

#### Pros

- Provides good adjacency between Structural Collapse Prop and existing overpass “Pit”;
- Confines Development within the contiguous part of the site

#### Cons

- Cutting into the hillside for the Storage area, Ground-level Cutting Prop, and Trenching Dig Prop will required significant retaining walls and groundwater mitigation;
- Doesn’t accommodate EVIP/Driver Training program on expansion site;
- Doesn’t accommodate Environmental Dig Prop;
- Doesn’t accommodate Low Slope Rescue training;
- Impacts to wildlife corridor.

### **4.2.4 Option 4**

#### **4.2.4.1 Description**

Option 4 focuses the majority of development within the 2.57 acres of contiguous developable land on the expansion site. Vehicular access Y’s off of the western approach to the existing overpass, then continues south along the toe of the slope to the vacated SW Roxbury right-of-way, then continues south along the property line, turning north again at about midway through the site, then connecting with the southern perimeter road for the JTF. The Multi-functional Paved area is pushed to the east on this option, located between Wetland 5 and Wetland 1. The Low Slope Rescue Prop could be located in the vacated SW Roxbury ROW, utilizing the steep slope and the deadend SW Roxbury.

The Structural Collapse Prop is situated directly adjacent to the existing “Pit” at the overpass, allow it to be used for basement

rescue / extraction. The Metal Cutting Prop area is located directly east of the Structural Collapse Prop.

The Ground-level Cutting Prop and Storage are south of the Structural Collapse and Metal Cutting Props.

To the east of the Structural Collapse and Metal Cutting Prop areas are the Dig Prop areas; Water, Drainage/Wastewater, Environmental, and Trenching.

To the east of the Dig Prop area is the Classroom Building, at the northeast tip of the 2.57 acres.

In the area east of Wetland 5 and west of Wetland 1 is the location of the Multi-functional Paved area, with room to accommodate up to 73 passenger vehicles.

#### Pros

- Provides good adjacency between Structural Collapse Prop and existing overpass “Pit”;
- Accommodates all 3 of SPU’s main Dig Prop areas;
- Multi-functional Paved area has good adjacency with Administration Building entrance, when area functions as parking.

#### Cons

- Doesn’t accommodate EVIP/Driver Training program on expansion site;
- Accommodates parking for only 73 passenger vehicles.

### **4.2.5 Option 5**

Option 5 infills Wetland 5 to create a contiguous developable site area of approximately 3.65 acres. By infilling Wetland 5/ Stream 5, we are able to gain enough length to accommodate EVIP training. Similar to Options 1-4, vehicular access Y’s off of the western approach to the existing overpass, then continues south at the toe of the slope at the west end of the site. At about midway across the site, the roadway turns east and becomes a double-loaded access road serving the Structural Collapse, Metal Cutting and EVIP pad on the north half of the site. Located on the south side of the roadway is the Ground-level Cutting Prop, Trenching Dig Prop, Water Dig Prop, Storage, Drainage/Wastewater Dig Prop, and the Environmental Dig Prop. The roadway then turns north to reconnect with the existing JTF south perimeter road. The Classroom Building is located at the west side of the buffer for Wetland 1.

Parking would occur on the existing EVIP pad, or could also occur on the expansion site EVIP pad, which can accommodate approximately 159 passenger vehicles.

#### Pros

- Provides good adjacency between Structural Collapse Prop and existing overpass “Pit”;
- Accommodates all 3 of SPU’s main Dig Prop areas;
- Accommodates a new EVIP pad that could potentially address CDL training needs.

#### Cons

- Dig Props will need to mitigate groundwater;
- Offsite wetland mitigation will likely be expensive;
- Doesn’t accommodate Low Slope Rescue training.

### **4.2.6 Option 6**

Option 6 is similar to Option 5 in program and layout, except it links the 2 developable portions of the expansion site by means of a bridge structure over Wetland 5/Stream 5 for the Driver Training program. Vehicular access Y’s off of the western approach to the existing overpass, then continues south at the toe of the slope at the west end of the site. At about midway across the site, the roadway turns east and becomes a double-loaded access road serving the Structural Collapse, Metal Cutting and EVIP pad on the north half of the site. Located on the south side of the roadway up to the west edge of Wetland 5 is the Ground-level Cutting Prop, Trenching Dig Prop, Drainage/Wastewater Dig Prop, Storage and the Environmental Dig Prop. The Classroom Building is located between Wetland 5 and the buffer for Wetland 1. This option assumes that the Water Dig Prop is located at the existing Dig Prop.

Parking would occur on the existing EVIP pad, or could also occur on the expansion site EVIP pad, which can accommodate approximately 159 passenger vehicles.

#### Pros

- Provides good adjacency between Structural Collapse Prop and existing overpass “Pit”;
- Accommodates 2 of the 3 SPU main Dig Prop areas;
- Accommodates a new EVIP pad that could potentially address CDL training needs;
- Accommodates 2 of the 3 SPU main Dig Prop areas;

- Bridge solution will not require permitting or off-site wetland mitigation.

Cons

- Dig Props will need to mitigate groundwater;
- Bridge structure will be relatively costly.

**4.2.7 Option 7**

Option 7 segregates the site, where the majority of SPU’s needs are accommodated on the expansion site, and SFD’s needs are fulfilled on the existing JTF site. This assumes that the area on the existing JTF site currently used for the Dig Prop and covered storage can accommodate the Structural Collapse and Metal Cutting Props. While the Structural Collapse Prop loses the desired proximity to the “Pit” area of the overpass, it was thought that a similar feature could be worked into the existing Confined Space Prop. This reprogramming of the existing JTF site allows the majority of SPU’s training to occur on the expansion site, and potentially increases the ability to schedule concurrent training events at the JTF (e.g. EVIP training wouldn’t monopolize the site)

This option has the same vehicular access starting at the west end with a “Y” off of the western approach to the overpass. The roadway continues to the south along the toe of the slope, then turns eastward along the south property line, then turns in a northeasterly direction along the edge of Wetland 5, connecting with the existing south perimeter road of the JTF.

The Water, Drainage/Wastewater, Environmental Dig Props, and Storage are located at the west end of the site. A Multi-functional Paved area capable of accommodating up to 97 passenger vehicles sits east of the Dig Props, and the Classroom Building is located in the northwest corner of this Multi-functional Paved area.

Pros

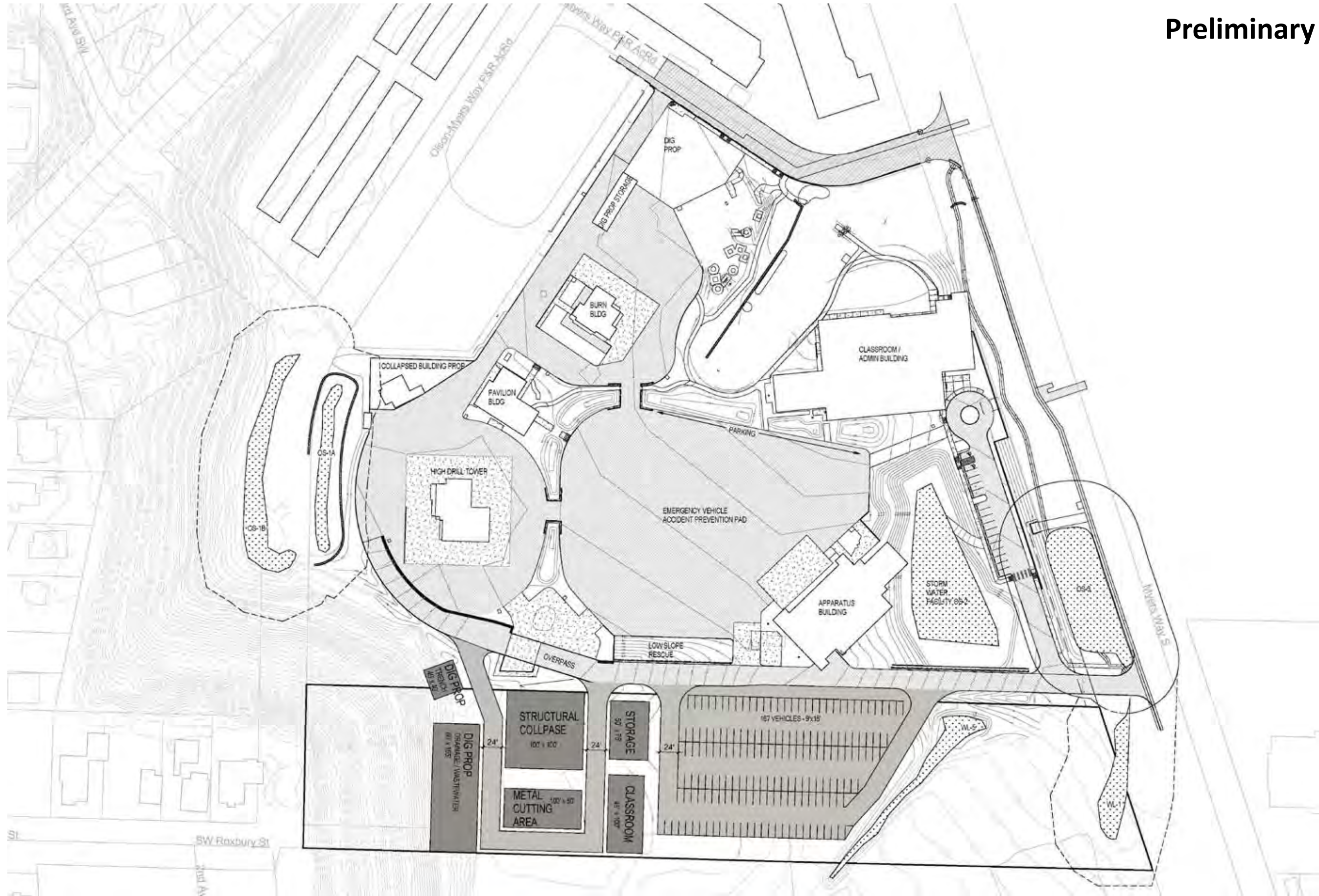
- Segregates training activities to allow concurrent training events;
- Accommodates the SPU Dig Prop areas.

Cons

- Dig Props will need to mitigate groundwater.
- Doesn’t accommodate Ground-level Cutting Prop on the expansion site.
- Doesn’t accommodate EVIP/Driver Training program on expansion site.
- Impacts to wildlife corridor.

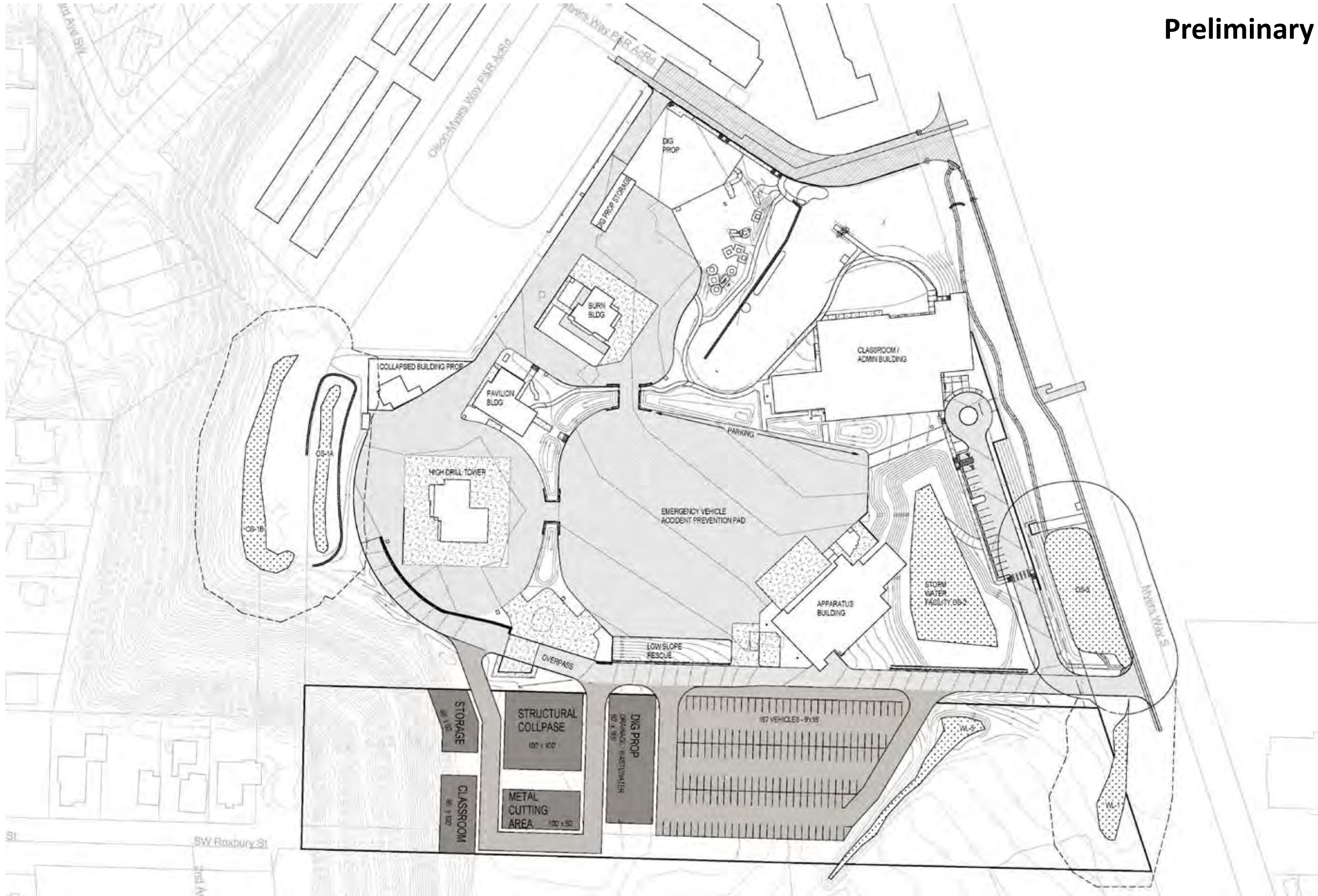


# Preliminary OPTION 1



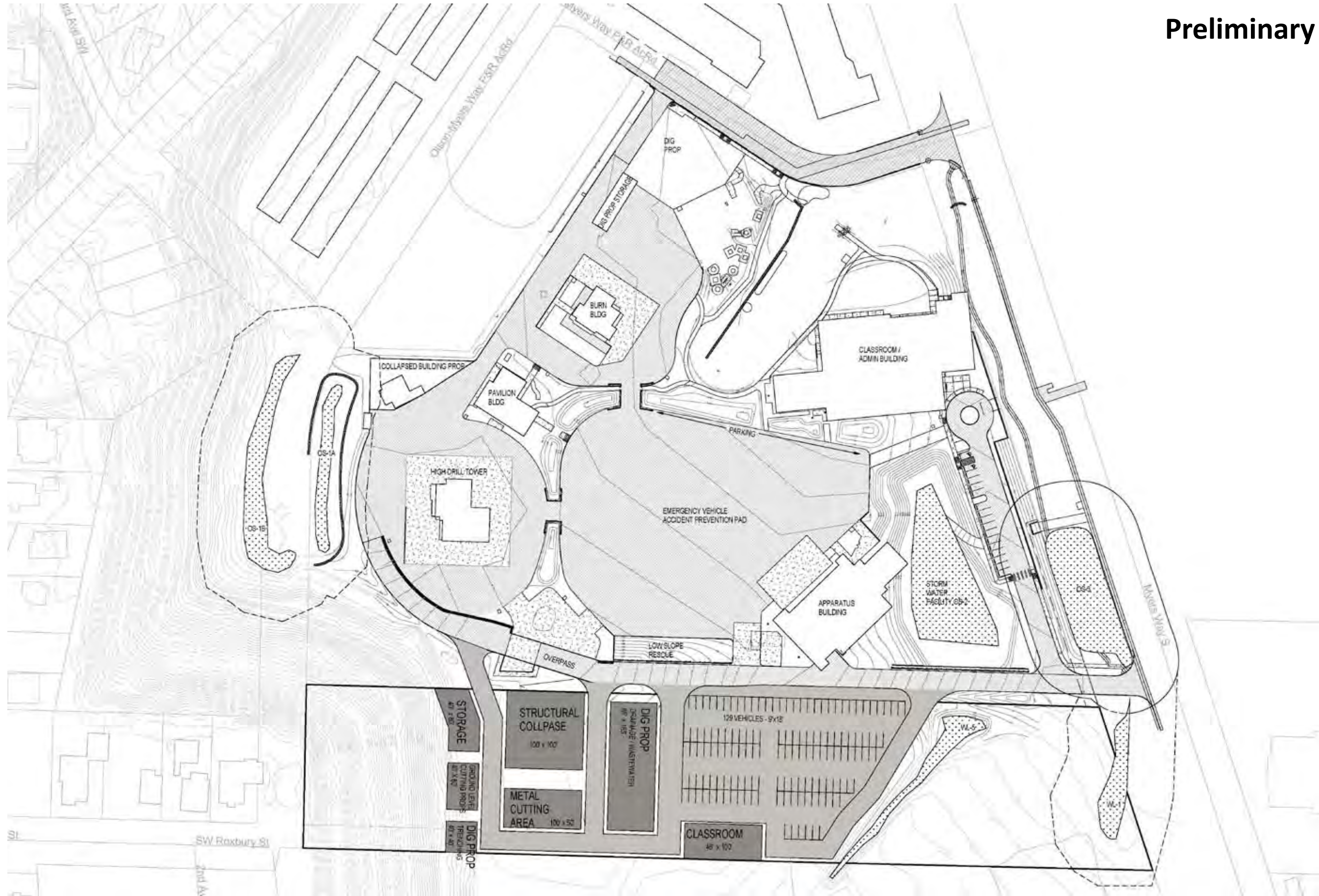


# Preliminary OPTION 2



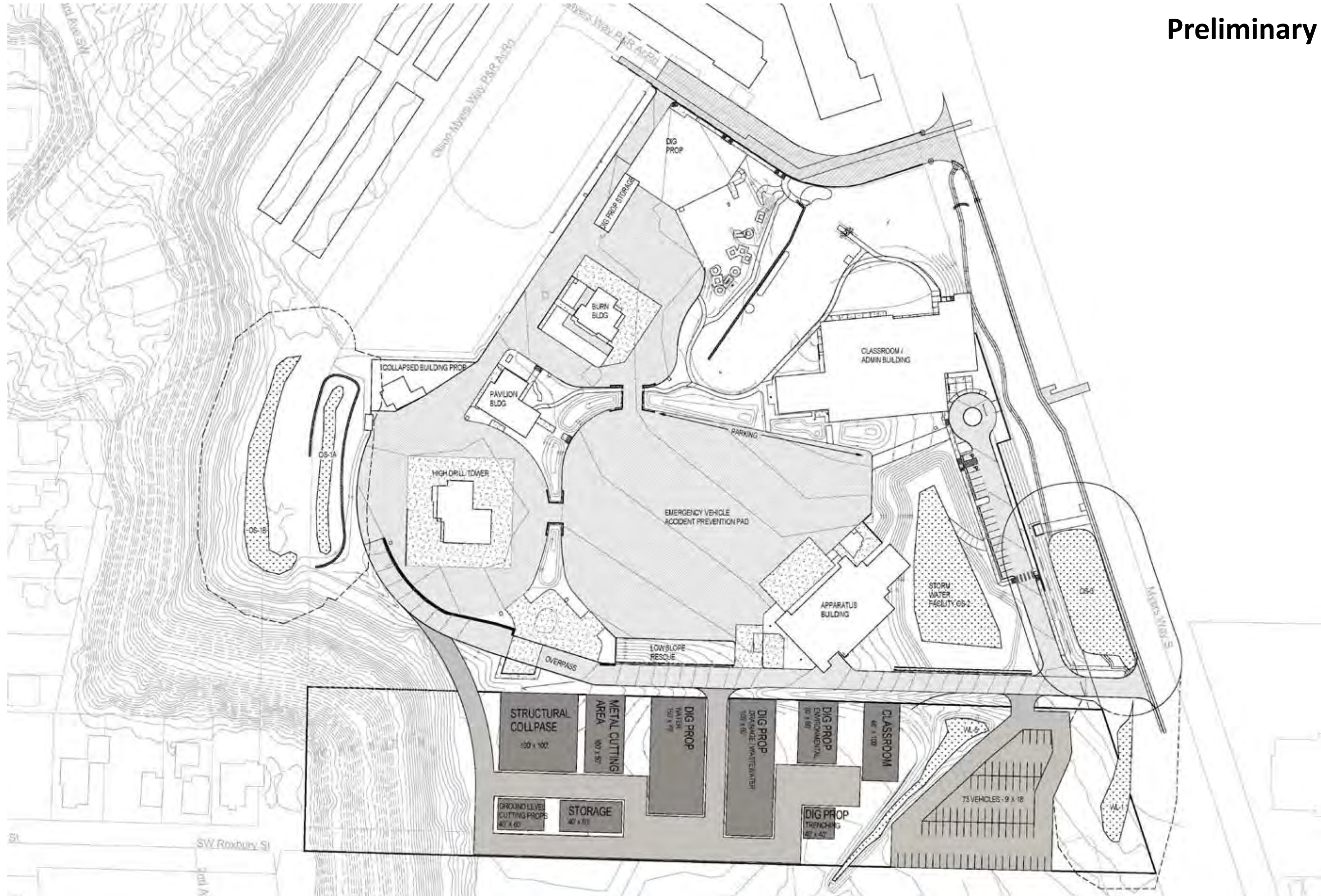


# Preliminary OPTION 3



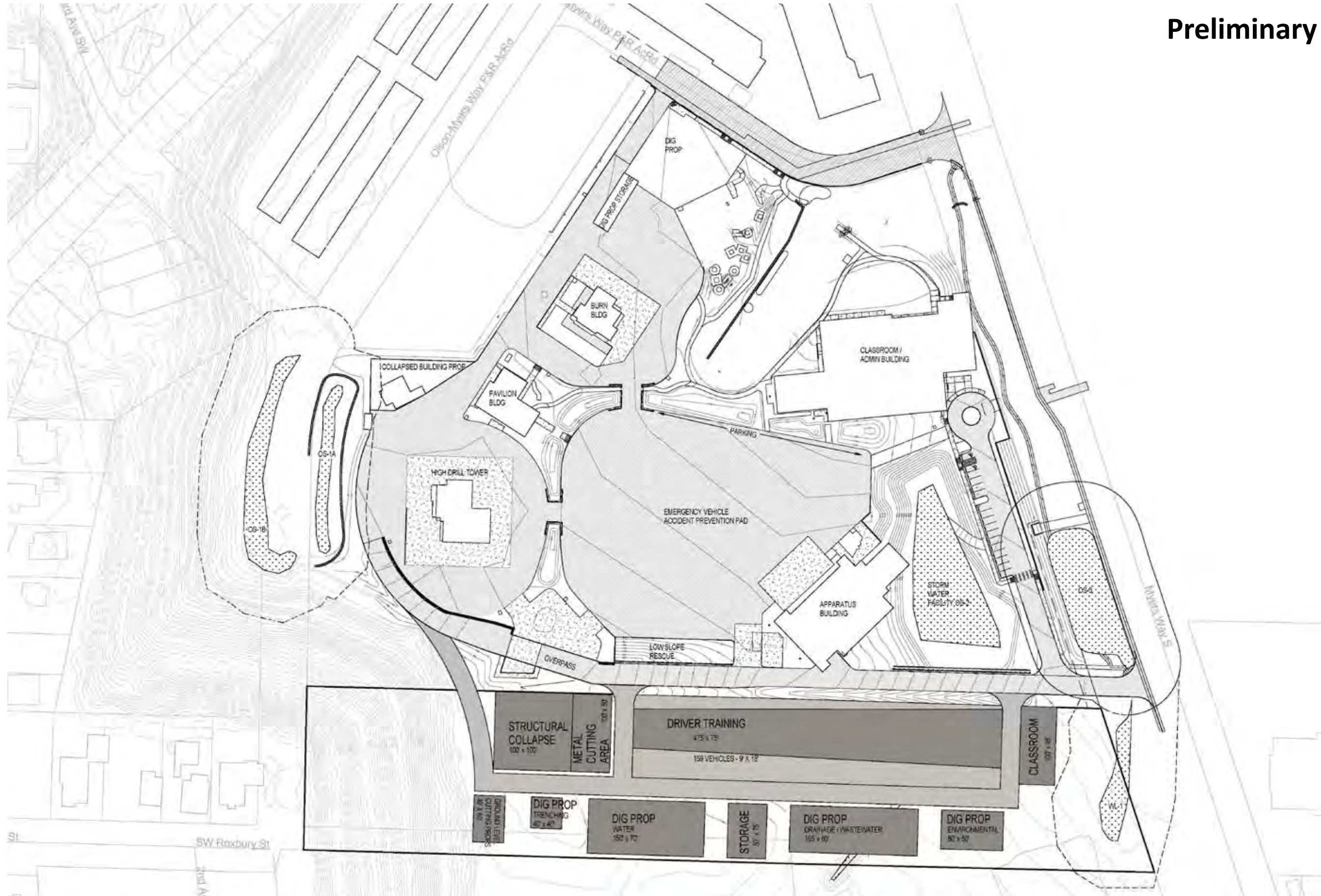


# Preliminary OPTION 4



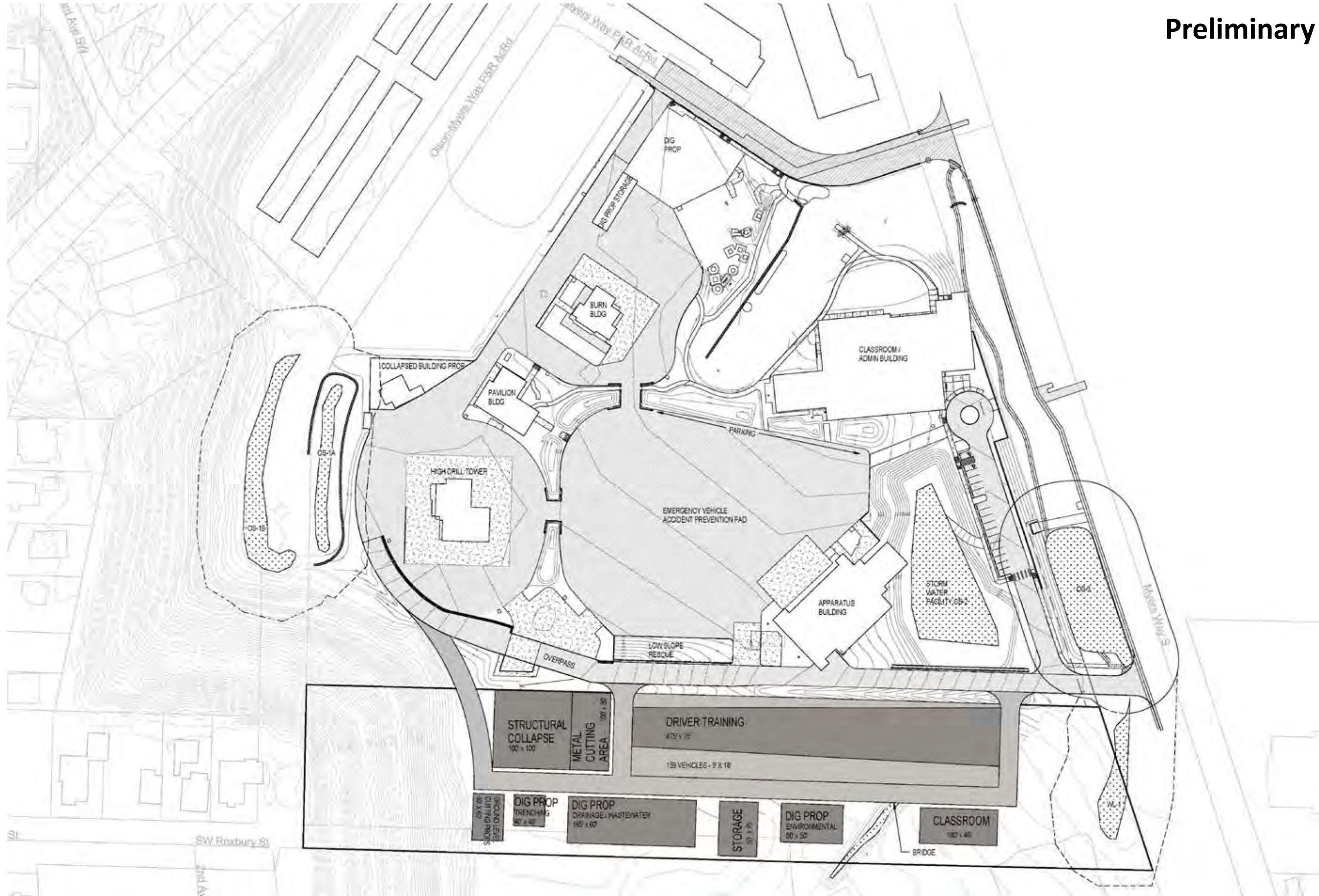


# Preliminary OPTION 5



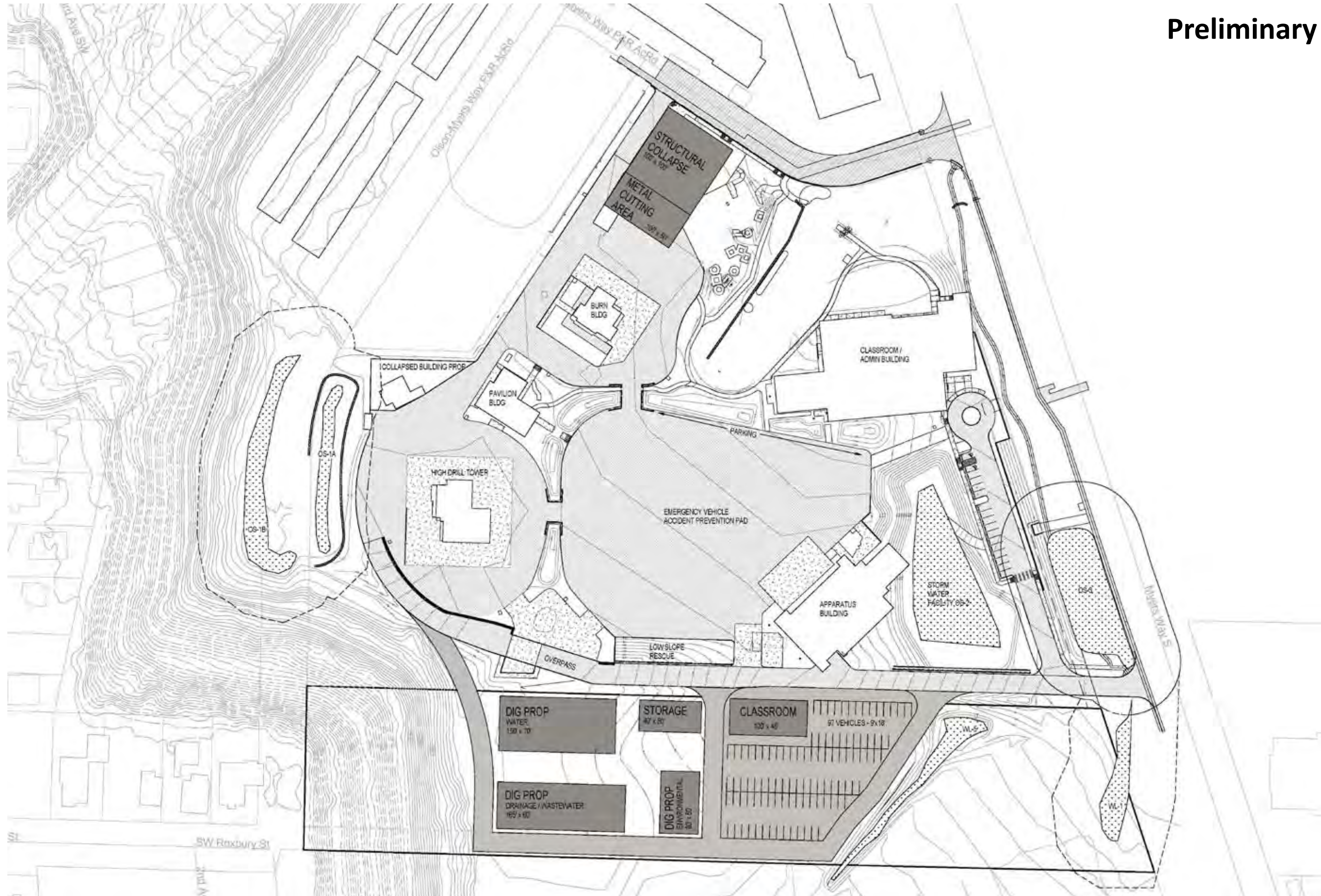


# Preliminary OPTION 6





# Preliminary OPTION 7





### **4.3 Preferred Options**

#### **4.3.1 General**

Key stakeholders from both SPU and SFD met to review the 7 options with the goal of narrowing the options to 2 Preferred Options which would be used for a costing exercise. The general criteria for the selection of the 2 Preferred Options were a) how much of the desired program is accommodated on the expansion site, and b) functionality and flexibility of the layout.

The presentation of the 7 options generated some additional general programmatic needs/desires from the key stakeholders. Those needs/desires are as follows:

- Current Perception and Reaction (P & R) training on the EVIP pad requires vehicles to circulate around the High Drill Tower in order to have the necessary length to perform the training on the EVIP pad, which eliminated SFD's ability to conduct trainings on both props concurrently. For options that don't accommodate a new EVIP pad on the expansion site, realignment of the P & R training course to a north-south orientation, which extends onto the expansion site to accommodate the necessary length, will allow both P & R training and use of the High Drill Tower to occur simultaneously. Vehicles would circulate around the Burn Building at the north end of the training course, and adequate maneuvering room would need to be provided at the south end. The existing south driveway access to the EVIP pad would need to be widened to 50 feet, with the added width coming out of the existing Low Slope Rescue training area.
- The vacated SW Roxbury right-of-way at the southwest corner of the site should be kept unprogrammed to allow use for Low Slope Rescue training. Adequate room at the toe of the slope should be left unprogrammed to provide a maneuvering and staging area for the training. A "deadman" anchor would be needed at the top of the slope, at the end of the SW Roxbury right-of-way, for Low Slope Rescue training.
- Accommodations should be made for future vehicular access to the parcel(s) to the south of the expansion site. This could be accommodated by an access road entering the expansion site off of the western approach to the overpass that continues south along the toe of the steep

slope, keeping the south leg of this road unprogrammed. This would also accommodate the need for the Low Slope Rescue Prop.

- The Classroom Building should be located near the work areas, such as the Structural Collapse Prop, to minimize travel time between classroom and prop area. It is also desired to have visual connection from classrooms to the work area to facilitate learning opportunities. Also, this would provide a restroom facility close to the prop area. The desire is also to have the ability to drive equipment directly into the classrooms.
- The Environmental Prop doesn't need to have a dedicated area, it can occur at the Wastewater/Drainage Prop, as it's an infrequent training opportunity.
- The Oil Spill Trailer currently stored off site will be relocated to the JTF site. It will need power, and ideally it would be located adjacent to the Environmental Prop.
- Enclosed/covered storage for SFD and SPU can be collocated in one building, but should be adjacent to respective work areas to the extent possible. Current SPU storage occupies approximately 2,400 SF. Representatives from SPU and SFD agreed that 3,000 to 3,5000 SF of additional storage would be adequate for both of their needs.
- The Tower Crane Rescue Prop can be located on the Structural Collapse Prop. It requires a 10' x 10' pad.
- Due to the high level of metal scraps in the gravel at the existing Dig Prop, the gravel should be removed to the native dirt subgrade, and new gravel brought in.
- The expansion site should accommodate 100 passenger vehicles at a minimum to cover classroom needs. It should not be striped for parking. Stall size should be 10 FT wide to accommodate the majority of City vehicles.
- Water source for the expansion site will likely come from a line that currently runs from the Apparatus Building to the Recycled Water area adjacent to the overpass. It is not an active line, having been capped at the east end several years ago.

#### 4.3.2 Preferred Option A

This option is a hybrid of Options 1-3, with the program spaces shifted to the east to avoid costly retaining of the steep slope. This was accomplished by reducing the parking capacity of the Multi-function Paved Area to align with minimum requirements discussed above. Other features of this option include:

- Western access roadway onto the site spurs off of the western approach to the overpass and continues south along the toe of the steep slope to the southern property line. The throat of this driveway accommodates truck traffic approaching from either direction.
- The Structural Collapse Prop is located adjacent to the existing Overpass and Pit area, allowing continued use of the Pit area for basement training. Further structural review of the retaining wall around the Pit is needed to determine the loading capacity of the area around the top of the wall.
- To the east of the Structural Collapse Prop, with a 30 FT buffer between, is the Metal Cutting Area.
- To the south of the Structural Collapse Prop, with an approximately 60 FT roadway/buffer between, is the Classroom Building along the southern edge of the property. This location allow the potential for a good visual connection to the Structural Collapse Prop. The northern orientation of this view will provide the least potential for glare issues when looking from the classrooms to the prop area. This adjacency with the roadway/buffer will also allow direct access to the classrooms for equipment demonstrations.
- The enclosed/covered Storage Area is shown as a continuation of the Classroom Building. It provides good adjacency to the Structural Collapse, Metal Cutting, Trenching, and Drainage/Wastewater/Environmental Props.
- The Trenching Dig Prop is located between the Storage and Metal Cutting Areas. It is also directly adjacent to the Drainage/Wastewater/Environmental Dig Prop, which allows some flexibility in the layout of the two prop areas. There should be some setback space between this prop and the Storage Area to the south to allow access to the Storage Area. Dewatering will likely be required to address

the seasonal high water table. However, the water table appears to be deeper as you move east, so locating this prop as far to the east as possible, without negatively impacting other functions, would help address this issue.

- The Drainage/Wastewater/Environmental Prop is located directly east of the Metal Cutting Area, Trenching Dig Prop, and the Storage Area. The prop area is situated transversely on the site, bifurcating the developable area with the prop areas to the west and the Multi-function Paved Area to the east. The east edge of the prop area is roughly aligned with the west edge of the widened southern access driveway to the EVIP pad. Dewatering may be necessary to address the seasonal high water table issue, if training is to occur year round.
- The Multi-function Paved Area extends from the east edge of the Drainage/Wastewater/Environmental Dig Prop to the edge of Wetland/Stream 5, and spans the entire width of the site. The area can accommodate a little more than (100) 10 FT x 19 FT parking stalls with 24 FT drive aisles. This area will have a slope from west to east that will be approximately 3.6%. This slope is dictated by the slope of the existing south access road, which the Multi-function Paved Area abuts; this assumes that the grades of the Multi-function Paved Area must match the grades of the south access road at the west and east ends, at a minimum, to allow at least two access point on to the Multi-function Paved Area. A slightly lesser slope could be achieved through retainage along the south side of the south access road, elimination of a few parking stalls, and a ramp down off of the Multi-function Pave Area at the east end.
- At the request of the key stakeholders, a gravel pad program area for miscellaneous overflow storage was added to the area between Wetland/Stream 5 and Wetland 1. This area would be secure, similar to other areas of the JTF site, and access to it would be via a driveway on the west side of the existing security gate.
- The existing Dig Prop area on the JTF site will be stripped to native soil to remove metal debris leftover from current metal cutting training, then filled back with gravel. This area will be reprogrammed to be the Water Dig Prop. There currently is a plan to bring potable water to this site, which will be needed for the Water Dig Prop training. With

the desired buffers, this dig prop area will utilize the exiting north access roadway as well as the currently paved area behind the existing dig prop covered storage. This option assumes that the existing covered storage would be rebuilt within close proximity to the Water Dig Prop.

- Based on feedback from the key stakeholder group, the Ground Level Cutting Prop could be absorbed somewhere on the existing JTF site. So, this option did not specifically identify an area for this prop. It could potentially be located where the current Collapsed Building Prop is located.

#### **4.3.3 Preferred Option B**

Options 5 and 6 were the only options that accommodate the full desired program on the expansion site, and of those two options Option 6 offers the most flexibility. Preferred Option B is based on Option 6 with a few minor but important revisions, which are 1) relocating the Classroom Building closer to the Structural Collapse Prop, and 2) provide for future vehicle access to the parcel south of the expansion site. Option B maximizes the developable area of the site by infilling Wetland/Stream 5 and regrades the site from the toe of the steep slope to the buffer for Wetland 1 to a slope of approximately 3.2%. Other features of this option include:

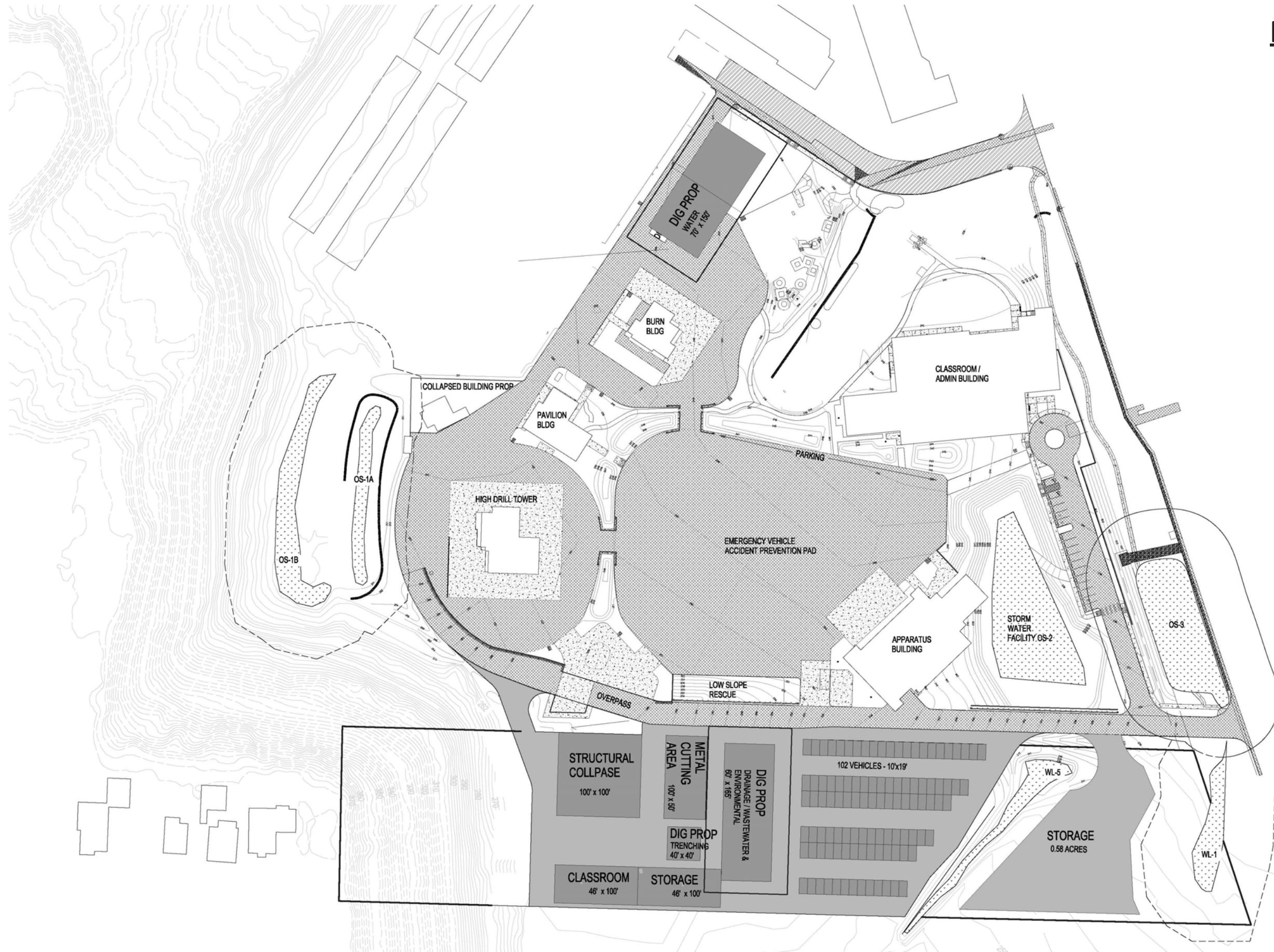
- Western access roadway onto the site spurs off of the western approach to the overpass and continues south along the toe of the steep slope to the southern property line. The throat of this driveway accommodates truck traffic approaching from either direction on the south access road.
- The Structural Collapse Prop is located adjacent to the existing Overpass and Pit area, allowing continued use of the Pit area for basement training. Further structural review of the retaining wall around the Pit is needed to determine the loading capacity of the area around the top of the wall.
- Directly east of the Structural Collapse Prop is the Metal Cutting Area.
- Continuing to the east is the Driver Training area, oriented in an east-west direction. The width of this area was determined by the dimensions for 2 rows of double loaded parking aisle, which is wider than what was identified for the needs of the driver training activities.

- Between the Metal Cutting Area and the Driver Training area is another potential vehicle access point off of the JTF south access roadway. Desired grades for the expansion site and access points will need to be coordinated.
- To the south of the Structural Collapse Prop, with an approximately 60 FT roadway/buffer between, is the Classroom Building along the southern edge of the property. This location allows the potential for a good visual connection to the Structural Collapse Prop. The northern orientation of this view will provide the least potential for glare issues when looking from the classrooms to the prop area. This adjacency with the roadway/buffer will also allow direct access to the classrooms for equipment demonstrations.
- The enclosed/covered Storage Area is directly adjacent to the Classroom Building. It provides good adjacency to the Structural Collapse, Metal Cutting, Trenching, and Drainage/Wastewater/Environmental Props.
- Directly to the east of the Storage Area is the Ground Level Cutting Prop.
- Continuing to the east is the Trenching Dig Prop. Dewatering will likely be required to address the seasonal high water table. However, the water table appears to be deeper as you move east, so locating this prop as far to the east as possible, without negatively impacting other functions, would help address this issue.
- The Water Dig Prop is located adjacent to the Trenching Prop. Given this area's water requirements, locating it close to the Classroom Building and other uses that require water will reduce the amount of pipe needed, and therefore costs. Dewatering may be required to address the seasonal high water table. This area also overlaps the current Wetland/Stream 5 area. Redirection of this conveyance system will need to be coordinated with the Dig Prop needs.
- The Drainage/Wastewater/Environmental Dig Prop is located in the southeast corner of the expansion site. Dewatering will likely be required to address the seasonal high water table. This area also overlaps the current Wetland/Stream 5 area. Redirection of this conveyance system will need to be coordinated with the Dig Prop needs.



# Preferred **OPTION A**

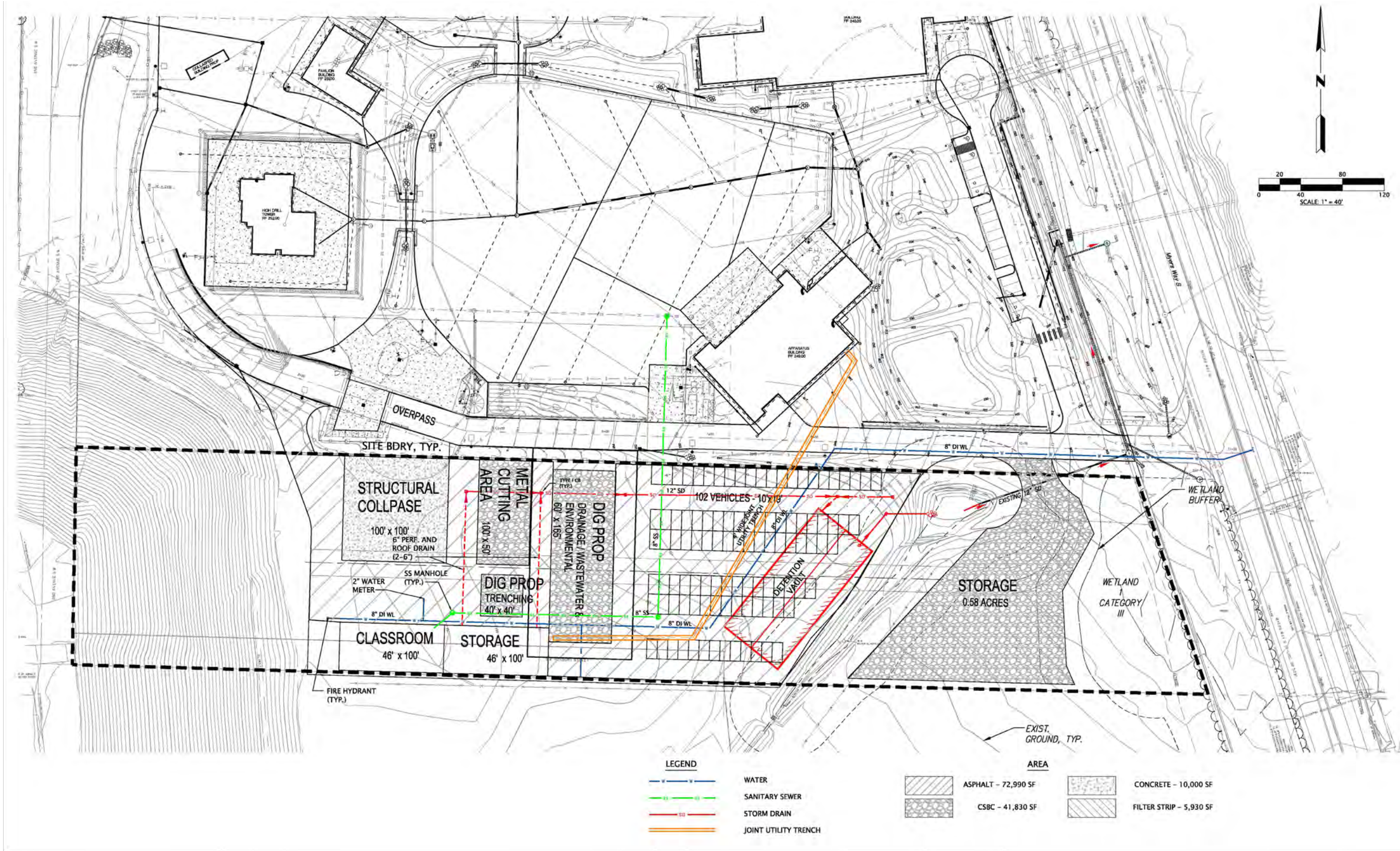
Conceptual Site Plan





# Preferred **OPTION A**

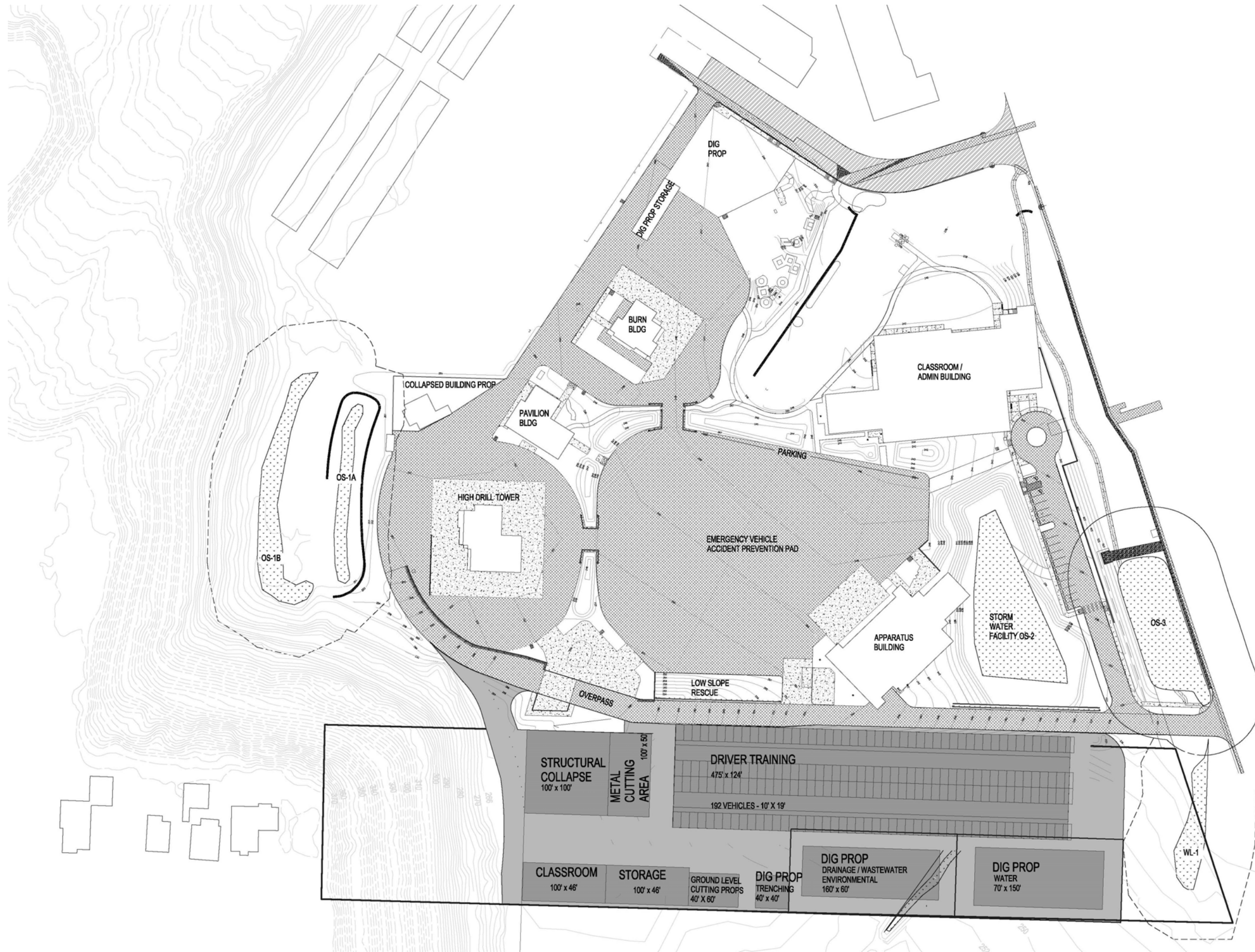
## Conceptual Civil Plan





# Preferred **OPTION B**

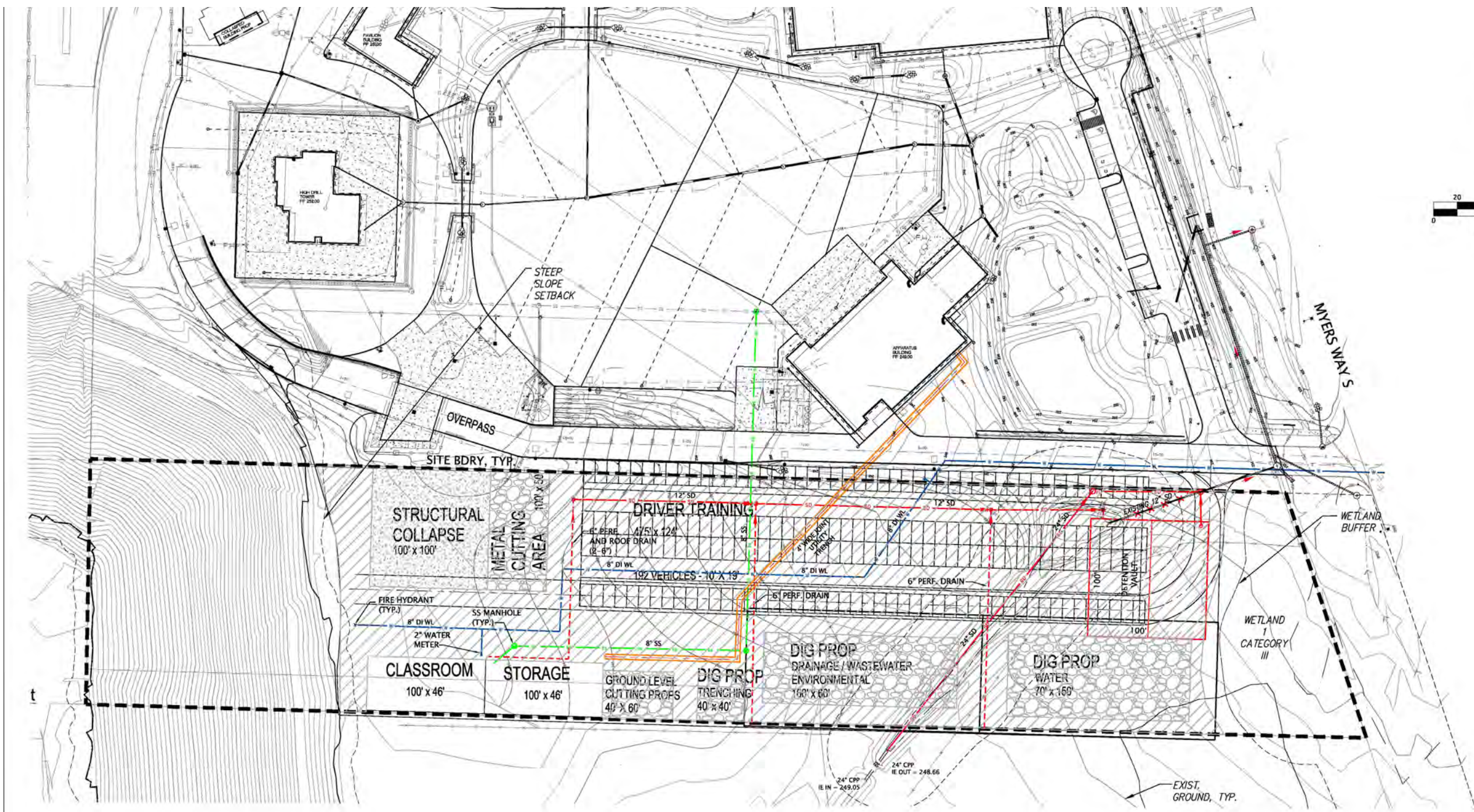
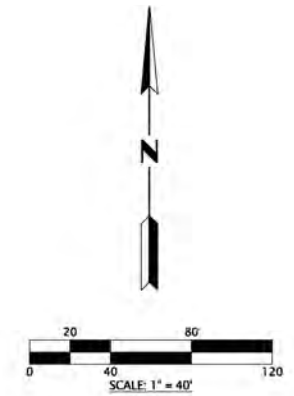
## Conceptual Site Plan





# Preferred **OPTION B**

## Conceptual Civil Plan



LEGEND		AREA	
	WATER		ASPHALT - 105,200 SF
	SANITARY SEWER		CONCRETE - 10,000 SF
	STORM DRAIN		CSBC - 18,600 SF
	JOINT UTILITY TRENCH		



### 4.3.4 Estimated Project Costs

JOINT TRAINING FACILITY EXPANSION - OPTION A (14171) SUMMARY  
PRELIMINARY DEVELOPMENT COST ESTIMATE

No.	Description	Cost	Comments
<b>COST SUMMARY</b>			
<b>HARD CONSTRUCTION COSTS</b>			
	OFF-SITE DEVELOPMENT	\$54,350	
	ON-SITE DEVELOPMENT	\$3,983,445	
	<b>SUBTOTAL HARD CONSTRUCTION COSTS</b>	<b>\$4,037,795</b>	
	CONSTRUCTION CONTINGENCY - 20%	\$807,559	
	<b>SUBTOTAL HARD CONSTRUCTION COSTS</b>	<b>\$4,845,354</b>	
<b>ESTIMATED INDIRECT SOFT COSTS</b>			
	GENERAL CONDITIONS (8%)	\$387,628	
	LIABILITY INSURANCE (0.5%)	\$24,227	
	BUILDERS RISK INSURANCE	\$0	
	GENERAL CONTRACTOR PAYMENT & PERFORMANCE BOND	\$0	
	A/E DESIGN COSTS (25%)	\$1,211,339	
	OTHER CONSULTANT FEES DURING CONSTRUCTION (3%)	\$145,361	
	MISC. FEES (3%)	\$145,361	
	TOTAL ESTIMATED FEES, PROCESSING DEPOSITS, & CONNECTION CHARGES BY CITY OF SEATTLE WATER	\$0	Unknown
	<b>SUBTOTAL ESTIMATED INDIRECT SOFT COSTS</b>	<b>\$1,913,915</b>	
	INDIRECT SOFT COST CONTINGENCY - 10%	\$191,392	
	<b>SUBTOTAL ESTIMATED INDIRECT SOFT COSTS</b>	<b>\$2,105,307</b>	
	<b>TOTAL DEVELOPMENT COST (Including Contingency)</b>	<b>\$6,950,661</b>	
	<b>PRELIMINARY DEVELOPMENT COST ESTIMATE</b>	<b>\$7,000,000</b>	

Notes:

This Preliminary Conceptual Cost Estimate is prepared for The City of Seattle Joint Training Facility Expansion Study. This preliminary estimate represents Goldsmith Land Development Services opinion based upon best available information. Unit costs do not assume prevailing wage costs.

*Prerred Option A Cost Estimate*

JOINT TRAINING FACILITY EXPANSION - OPTION B (14171) SUMMARY  
PRELIMINARY DEVELOPMENT COST ESTIMATE

No.	Description	Cost	Comments
<b>COST SUMMARY</b>			
<b>HARD CONSTRUCTION COSTS</b>			
	OFF-SITE DEVELOPMENT	\$54,350	
	ON-SITE DEVELOPMENT	\$4,231,000	
	<b>SUBTOTAL HARD CONSTRUCTION COSTS</b>	<b>\$4,285,350</b>	
	CONSTRUCTION CONTINGENCY - 20%	\$857,070	
	<b>SUBTOTAL HARD CONSTRUCTION COSTS</b>	<b>\$5,142,420</b>	
<b>ESTIMATED INDIRECT SOFT COSTS</b>			
	GENERAL CONDITIONS (8%)	\$411,394	
	LIABILITY INSURANCE (0.5%)	\$25,712	
	BUILDERS RISK INSURANCE	\$0	
	GENERAL CONTRACTOR PAYMENT & PERFORMANCE BOND	\$0	
	WETLAND MITIGATION	\$270,000	Purchase through KC Mitigation Reserves Program
	ENVIRONMENTAL CONSULTANT FEES	\$60,000	401/404 Permit
	A/E DESIGN COSTS (25%)	\$1,285,605	
	OTHER CONSULTANT FEES DURING CONSTRUCTION (3%)	\$154,273	
	MISC. FEES (3%)	\$154,273	
	TOTAL ESTIMATED FEES, PROCESSING DEPOSITS, & CONNECTION CHARGES BY CITY OF SEATTLE WATER	\$0	Unknown
	<b>SUBTOTAL ESTIMATED INDIRECT SOFT COSTS</b>	<b>\$2,361,256</b>	
	INDIRECT SOFT COST CONTINGENCY - 10%	\$236,126	
	<b>SUBTOTAL ESTIMATED INDIRECT SOFT COSTS</b>	<b>\$2,597,382</b>	
	<b>TOTAL DEVELOPMENT COST (Including Contingency)</b>	<b>\$7,739,802</b>	
	<b>PRELIMINARY DEVELOPMENT COST ESTIMATE</b>	<b>\$7,750,000</b>	

Notes:

This Preliminary Conceptual Cost Estimate is prepared for The City of Seattle Joint Training Facility Expansion Study. This preliminary estimate represents Goldsmith Land Development Services opinion based upon best available information. Unit costs do not assume prevailing wage costs.

*Prerred Option B Cost Estimate*

Estimated total project costs for the 2 Preferred Options A & B are on the preceding page. These estimates are made up of the estimated cost of construction (“hard costs”) and estimated indirect “soft costs”, such as insurance, mitigation, fees and permits. A detailed breakdown of these costs are included in the appendix.

The sums do not include the estimated \$3,528,360 of the loan debt and interest and infrastructure improvement costs. The City of Seattle’s Department of Finance and Administrative Services Real Estate Management estimates that loan repayment and infrastructure improvement costs to be approximately \$30/s.f.

## **5 CONCLUSION**

Based on preliminary programmatic space needs developed through input from project stakeholders over the course of the study through questionnaires, meetings and email correspondence, as well as information provided to us about the programming of the current JTF site, it appears that the JTF expansion site can accommodate the unmet needs of the training facility while also helping resolve scheduling challenges encountered with the current JTF site layout. 2 preferred options were chosen out of a group of 7 preliminary options for further refinement

Preferred Option A accommodates the majority of the needs on the expansion site while also relying on the reconfiguration of the existing JTF Dig Prop and reorientation of the Perception and Reaction driving course on the existing EVIP pad. So, in this option a portion of the unmet need is fulfilled through reprogramming of the existing JTF site.

Preferred Option B accommodates the entire program for unmet needs on the JTF expansion site without the reconfiguration of the existing JTF site. It does so by filling Wetland/Stream 5 to create a larger contiguous developable area, which will require a more extensive permitting process and impact the overall cost of the project.

There is an approximately 10% variance in cost between the 2 options, with Preferred Option B having the highest cost.

This exercise essentially performed a test-fit of the desired programmatic space needs with the JTF expansion site. If the project were to receive funding, a detailed facility program



should be developed, which would be used as a basis for the refinement of one of the two preferred options.



## **APPENDICES**

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