Matanuska-Susitna Borough

Central Mat-Su Fire Training Center

Master Plan

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ECI/HYER ARCHITECTURE & INTERIORS

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1 Introduction

The Central Mat-Su Fire Training Center (Training Center) will serve as a comprehensive training center for emergency response personnel from eight fire stations in the Central Mat-Su Fire Service Area (CMSFSA). The training and certification of the over 140 on-call responders is critical in developing and maintaining an effective emergency response system. The Training Center will also be available for use by fire departments and emergency response agencies from other regions within the State of Alaska. Broad usage of this facility is expected to strengthen the statewide network of public safety agencies and emergency responders by fostering closer working relationships between the various groups.

The 74-acre campus, located at the intersection of Knik Goose Bay Road (KGB) and Vine Road (Milepost 7 Knik-Goose Bay Road), provides an opportunity to develop a state-of-the-art educational and training campus with a focus on scenario-based training. The Training Center will provide a greater sense of realism for trainees by better simulating the risks and dangers that emergency responders face in "real-life" circumstances, and by incorporating changing technologies in fire suppression and fire prevention, as well as the capability to vary the complexity and challenge of response. The benefits of well-trained and knowledgeable responders are:

- Reduced injuries and deaths of civilians and fire fighters
- Reduced number of fires and property damage
- Increased efficiency of the fire fighting force

The purpose of this Master Plan is to outline a development plan for the campus that:

- Incorporates specific and key training opportunities identified by stakeholders as important to the fire department.
- Provides a multi-functional training facility that supports a broad range of realistic training scenarios for emergency services personnel.
- Identifies a range of short-term, mid-term, and long- term projects that can be phased in response to funding availability.
- Identifies a rough order magnitude of construction cost for specific training areas that will provide a menu of options for future development.
- Is efficient and cost effective.
- Accommodates future expansion to respond to demands associated with growth in population and service areas.
- Promotes compatibility with adjacent neighborhoods.

The Master Plan is the result of an iterative design and planning process that went through several changes with respect to facility and infrastructure components and their locations. The planning process generally had three key components: (1) Regular work sessions with key stakeholders to identify current and future training needs, organizational structures, and potential teaming partners; (2) site investigations, determination of infrastructure needs, facility programming, conceptual layouts for facilities and props, and (3) preparing a campus master plan document including a prioritized set of phased actions for the next several years to realize the planning process goals. It is important to

understand that this plan is intended to be revisited, confirmed, and improved with each phase of development.

1.1 Service Area Overview

The Matanuska Susitna Borough (MSB) Department of Emergency Services (DES) is charged with the protection of lives and property. It is comprised of fire protection and emergency medical services; water, technical, off-road, and hazmat rescue services; emergency management and community preparedness programs; enhanced 911 services; and emergency vehicle maintenance. The MSB has a total population of 96,074 (as of 2013, DCCED-certified) distributed over 24,582 square miles. Although the majority of the population is concentrated in the "core area" (i.e., 100 square miles located around the cities of Palmer and Wasilla), the district's widely scattered population and large area increases the challenge to emergency responsiveness.

The Central Mat-Su Fire Department (CMSFD) provides fire protection for the core area of the MSB, and is second largest and second busiest fire department in Alaska. The service area population is approximately 48,000, or about 48 percent of the Borough's population. The department operates a combined system of approximately 120 on-call responders supplemented with 20 full time staff. The department's two sections, fire and rescue, each have their own funding, membership requirements, and equipment. CMSFD stations include:

- Station 5-1: 1911 S Terrace Court, Palmer
- Station 5-2: 7731 E Bogard Rd, Palmer
- Station 6-1: 101 W Swanson Ave, Wasilla
- Station 6-2: 4568 S Knik-Goose Bay Rd, Wasilla
- Station 6-3: 11021 W Horizon Dr., Wasilla
- Station 6-4: 18297 W Point Mackenzie Rd, Wasilla
- Station 6-5: 680 N Seward Meridian Pkwy, Wasilla,
- Station 6-6: 2330 W Fairview Loop, Wasilla

Fire stations for other fire departments in the MSB include:

Victory Volunteer Fire Department

Sutton Fire Department

- Station 1-1: 15625 N Glenn Highway
- Station 1-2: 11317 N Jonesville Mine Road

Butte Fire Department

- Station 2-1: 3355 S Old Glenn Highway
- Station 2-2: 8271 S Ben Hur Drive

Greater Palmer Fire Department

- Station 3-2: 5955 N Glenn Highway

- Station 3-3: 5855 E Clark Road
- Station 3-5: 8200 Turner Road

West Lakes Fire Department

- Station 7-1: 1685 N Pittman Road
- Station 7-2: 5182 N Pittman Road
- Station 7-3: 1250 Spring Drive
- Station 8-1: 3047 S Big Lake Road
- Station 8-2: 1951 W Penny Kay Lane

Houston Fire Department

- Station 9-1: 13965 W Armstrong Road

Willow Fire Department

- Station 12-1: (907) 861-8121
- Station 12-2: (907) 861-5005
- Station 12-5 Crystal Lakes
- Station 12-6 Nancy Lake

Caswell Fire Department

- Station 13-1: (907) 892-6255

Talkeetna Fire Department

- Station 11-1: (907) 861-8115
- Station 11-2: (907) 861-8116

Photo 1 – Matanuska-Susitna Borough

1.2 Potential Partnerships

Potential partnerships can result in gifts-in-kind to enhance the training center, provide labor to develop the training areas, or potentially provide revenue for program development. Partners, including those who may have an interest or need for emergency services training, may be in the position to apply for a grant for training equipment or props but have no suitable location in which to place it. Partnerships can locate props at a central location where they can be used by multiple groups. A central facility could provide numerous partnership benefits, such as the following:

- Other regional fire authorities would likely use the training campus, as available, for their own department training. CMSFD and other fire authorities could 'trade for use' each of their training facilities and campus assets, avoiding duplication of facilities.
- State Troopers: Potential use of driving course, if available.
- Alaska Railroad: Donation of prop materials and items such as a rail car and track. A short section of donated track could be incorporated into the driver training course for a rail crossing.
- University of Alaska: Educational partnership in conjunction with their Associate of Applied Science in Fire and Emergency Services Technology. This could include props demonstrating fire behavior, or partners with vendors of fire alarm and fire sprinkler systems to demonstrate how these systems are operated.
- State of Alaska Division of Forestry/Department of Natural Resources: Use of the wildland rescue, steep terrain rescue, and driving course. This partnership would likely exchange labor and revenue for training area development for future use of the training props.

- Usage by agencies such as the Department of Homeland Security, Drug Enforcement Agency / Federal Bureau of Investigations, and State of Alaska Department of Environmental Conversation.
- Search and rescue groups: Use of the wildland rescue, steep terrain rescue, and driving course. This partnership would likely exchange labor for training area development for future use of the training props.
- Tourism industry: Industry props/materials might be donated in return for training opportunities of private industry drivers, guides, and safety officers who have mandatory training certification requirements. Props might include a used tour bus.
- Oil Industry: Industry props/materials might be donated in return for training opportunities of private industry safety officers and emergency response teams who have mandatory training certification requirements. Props might be oil tank rail cars or semi-tanker tank cars.
- Usage by tribal organizations and various communities-at-large.

As the Training Center becomes more established and develops current and future programs, partnership opportunities are expected to grow.

2 Fire Training Center Design Considerations

To adequately plan the campus for both near-term and long-term improvements, multiple work sessions were held with MSB and CMSFD stakeholders to understand the more specific goals and priorities for the future Training Center. Key considerations from those meetings, which have informed the overall campus layout, required facilities, and training props, are summarized below.

General Site Design

- Plan for phased development: facilities and props should be developed in functional phases, and as funds become available.
- A 100-foot vegetative buffer should be maintained and protected around the site perimeter to provide a visual screening buffer between the site and adjacent land uses. This excludes the property boarding the KGB Road and Vine Road.
- The prevalent wind direction should be considered so that smoke generated by the training center does not interfere with the surrounding area or buildings. Residues from extinguishing agents and products of combustion may be found a considerable distance from the training sites.
- Noise is also a factor that should be considered. The existing terrain should be used to direct noise away from populated areas, or located in lower elevation areas where sound is attenuated.
- Trees should be retained on the site, to the extent practical. Vegetation can help mitigate noise and prevent windblown debris from leaving the site. It also provides opportunities for realistic training scenarios and contributes to site aesthetics.
- The site perimeter will require security fencing with electronic vehicle gates.
- Site lighting will be provided at the outdoor live fire props, mock subdivision, drill yard, parking areas and driving course pad.
- The design needs to address surface runoff and drainage for all facilities and props.
- Props should have parking pads to facilitate staging of emergency vehicles and driveway access.
- The prop training areas will need propane and natural gas sources.
- The training campus is to be used only by authorized users and not open to the public.

Training Classes and Functionality

- Between 60 and 90 firefighters will attend a typical training event.
- Fire training academies will typically average 30 attendees.
- A Rescue Technician class is held once a year. Thirty vehicles are brought to the site for vehicle extrication training.
- Training campus and props must be laid out and designed to make the most of limited time. Paid "on-call" fire fighters are limited to 29.9 hours per week. If they are on duty for 24 hours, 5.9 hours are left for training.
- The training center needs to be able to hold multiple classes at once (at least two).
- The design requires maximum flexibility in use of both indoor and outdoor spaces.
- Training props and evolutions must be as realistic as possible.

- Short re-set times between training evolutions are very important.
- Snow removal and ice build-up are concerns at the training towers and props.

Parking

- The site should have limited parking area for "public use" on the unsecured side of the facility with the majority of parking located within the secured area. Estimated parking demand is as follows:
    - Cadet parking: 60 stalls (two classes of 30 cadets each).
    - Paid on-call firefighter weekly training: 60 to 70 attendees, however, most will park at duty stations and travel to the training site in groups using emergency vehicles.
    - All department training/auditorium use: 120 stalls.
    - Training staff/admin parking: 6 to 10 employees.
    - Station 6-2 Replacement: 12 stalls to match sleep room count, plus 2 for visitors. Firefighter parking to be on secure side with headbolt heaters.
    - For comparison, the existing parking (114 stalls) at Station 6-1 is insufficient for large events.
    - Public parking would typically be used by community councils, visitors, and school groups.
- In general, firefighter, staff, and trainee parking should be located on the "secure" side.

Buildings

- Station 6-2 needs to be replaced. The existing 4,200 SF fire station is undersized to meet current service area demands, and the service area is one of the fastest growing regions in the MSB.
- A new fire station/training center should include:
    - Administration/Classroom/Training/Skills /Warehouse Building(s), including one bay dedicated for fleet maintenance.
    - Warehouse storage space for equipment and vehicles.
    - Station 6-2 must be operationally independent from the rest of the training campus. Functional separation between Station 6-2 emergency response teams and the training functions can be accommodated in one shared building with a common lobby separating the uses and strategically located site security fencing.
    - CMSFD would like to house a 30-foot long historic fire truck in one of the new facilities.
- Upon completion of the new Station 6-2, the old station can be used for storage of training apparatuses and vehicles in the short-term. Pending future funding, it should be repurposed to a higher and better use, which, given its age and configuration, may function as a firefighter maze or confidence course. Additional improvements may include mechanical and electrical updates to better support future uses and reduce maintenance.
- Outdoor rehabilitation areas should be included, including remote classrooms/shelters for outlying areas of the campus.
- A sheltered space, such as a 40 x 40 SF paved and covered area of outdoor storage that is not highly visible, is desired to construct/assemble and store props (as many props are built 'in house' by CMSFD).

- Picnic pavilions for gatherings: one or more locations, as specifically identified in future development plans.
- Data/Communications: all occupied buildings should have fiber-optics connection.

Fire Training Towers, Props, and Other Training Support

Very little smoke or air quality issues will be associated with the live fire training props used. Fuel sources used for fire training exercises consist of natural gas and propane. Live fire training exercises will also use water with the possibility of foam. In future phases of the project, training may offer props for flammable liquid and gas fires. All these props will use clean burning natural gas or propane as fuels.

Mock Subdivision/Community

- A mock fire training subdivision should include a mix of single family, multi-family, and commercial structures backed with naturally vegetated forested areas. The use of these structures will be comprised of search-and-rescue training evolutions and live fire structures within some of the buildings. These activities would simulate many scenarios in the Mat-Su. Police departments could also use the facility for tactical training.
- The design could relocate the existing training tower to this mock subdivision training location.
- Mock power lines need to be included in the subdivision and/or along roadways.
- The live fire training props should be located adjacent or part of the mock subdivision.

Driver Training

Driver training includes two main areas: the 350-foot by 600-foot asphalt paved Driver Training Pad on the north side of the campus and the East and West roads (on-site roadways). The course should implement use of limited traffic controls, such as signage and pavement markings, to simulate public roadways.

3 Props

Props and prop areas should offer more than one type of use, and the Training Center should use existing systems as training props wherever possible when designing new facilities (example: a sprinkler lab in a classroom).

The following props were identified during the May 2015 workshop session as desired. This list is not intended to be exhaustive of all future prop needs or desires.

- Stand-alone gas-based units that can be positioned virtually anywhere around the training site – aircraft wing fire, helicopter fire, pressure vessel/tank.
- An emergency vehicle operations course, with a driver training course testing pad.
- A technical rescue /vehicle extrication pad, which could be accomplished on driver training course testing pad.
- Aircraft rescue props.
- Spill containment training, likely as part of the driver training course testing pad and/or vehicle extraction pad.
- Concrete basin pit (currently pits for gas fires).
- Outdoor gas-fired prop area for dumpster fires, vehicle fire, rail fire, etc.
- Facility for fire investigation training with sprinkler system.
- Ventilation prop to simulate pitched and flat roofs – 22 by 34 feet long.
- For aerial operations, an area that is accessible from 360 degrees.
- Maze training/confidence room, could be accommodated in repurposed Station 6-2.
- Forcible entry – wall breech, Denver drill – incorporate into buildings if possible.
- A drafting pond for training. Tenders could circle and discharge to pond to reduce water usage. The pond would be lined and drained in the winter.
- Helipad for emergency use only: use vehicle driving course, or an established lawn area that can also be used for fitness or recreation.
- Pumper test area: use paved concrete area for mobile draft test (must be on concrete pad).
- ATV training course.
- Ropes training course on the steeper site slopes.
- Functional water tank should double as a prop to simulate gas tank fire and rescue.

Lower Priority Props

- Training opportunities that will occur offsite at other location(s): water/ice rescues.
- Low priority training because it is provided at the Anchorage Fire Department training facility: Technical training for structural collapse and confined space.
- Trench collapse training needs programmed space but uses props provided by Anchorage Fire Department.

Additionally and as appropriate, planning considerations from the *National Fire Protection Association (NFPA) 1402, Guide to Building Fire Service Training Centers 2012* are incorporated by reference for the design of Training Center facilities and props.

3.1 Target Hazards in Fire Service Area

The vision for the campus is to create realistic training environments that closely duplicate the challenges encountered by firefighters. Too often training facilities do little to recreate the context in which service is provided and thus serve to limit the effectiveness of training. Training in context is a key factor in limiting injury or death and improving performance, as it is the only way to create the stress and information overload common in chaotic emergency events.

To this end, target hazards in the Mat-Su Borough were identified during stakeholder meetings. Target hazards are areas of a community that stand the greatest risk of fire and life loss (both to the community and to emergency responders). They are locations or plausible scenarios in which a fire department could quickly become overwhelmed and for which additional resources would be needed. CMSFD desires to focus its training on MSB target hazards.

Existing target hazards in the MSB include:

- Single family residential subdivision developments
- Residential neighborhoods and wildland interface fires
- Multi-family residential developments: duplex, four-plex and larger
- Non-reported assisted living facilities
- Ambulatory care facilities
- "Big-box" stores
- Rail and truck hazardous material fires (related to these modes of transport throughout the MSB)
- Recycle yards and tires
- Industrial/manufacturing facilities such as:
    - Liquid natural gas truck transportation
    - Welding and drill head repair, with liquefied O2
    - Wood truss manufacturing
    - Structural insulated panels (SIPS) manufacturing
    - Port MacKenzie – metal shredding, tank farm

As the Training Center campus is developed, target hazards should be periodically reviewed to ensure new fire training structures and props are providing the most effective training.

4 Site Infrastructure

4.1 Property Overview

Station 6-2 is located on the southern side of the Training Center campus and has direct access to Knik-Goose Bay (KGB) Road. An existing fire training tower is located approximately 100 feet to the northeast. An on-site water well and septic system serve the existing fire station. Two buried water tanks used in support of the fire training drills are located below the asphalt pavement to the southeast of the training tower. A fire hydrant and manhole roughly identify the locations of the buried water tanks.

In 2014, development of the campus into a regional fire training center began with construction of the East and West Roads, which provide a looped access around the campus and connectivity to Cruiser Drive and KGB Road. In a subsequent project, these two roads were paved in the summer of 2015. The roadway improvements include a closed water piping system, installed below the onsite roadways and Cruiser Drive, and several fire hydrants near the edge of the road throughout the campus. A water source has not been developed to supply the necessary training water for this distribution system and these pipes are currently empty. Perimeter security fencing with manual access gates were also installed. The remainder of the site is undeveloped and forested.

The site topography of the campus area provides both opportunities and challenges for the training area development, as the property has a wide range of slopes, high areas, and low areas. The entire site should be considered usable for developing as many training areas as possible to maximize beneficial use of the property. The northwest section, which is roughly one-third of the property, is characterized by mild slopes and is ideal for training areas that require fairly level topography for development. The southeast area, also approximately one-third of the site, is bounded by the Vine Road, KGB Road and East Road and features mild to moderate slopes, where most of the vertical development will occur. Construction techniques will require moderate amounts of earthwork to prepare level or gently sloping surfaces for building and parking and training areas. The remaining property between these two areas consists of very steep slopes, where specific types of training could occur that would take advantage of the natural land features. This middle area also features a low depression with open grass meadows that are classified as wetlands.

In designing facilities, training towers, and burn buildings, it may be advantageous to create multi-story buildings with on-grade access to different floors on opposite sides of the building. In a simulated residential structure, a daylight basement is replicated. A simulated commercial structure could test the communication between responders entering from opposing sides of the building. Variable topography would also be beneficial for driver training, as well as for extrication of a car over an embankment.

In July 2015, two small wetlands on the site were field-verified and determined to be under the U.S. Army Corps of Engineer's regulatory jurisdiction (Appendix B). Both wetlands are "depressional" systems surrounded by upland forests. Section 404 of the Clean Water Act requires that a permit must be obtained prior to placement or discharge of dredged and/or fill material into the wetlands. The

CMSFD should request re-evaluation of these wetlands in the future to confirm that they meet the minimum requirements of a wetland. Change of environmental factors, such as weather patterns and subsurface ground water levels, will directly affect the surface character of the land and possibly change the wetlands determination.

4.2 Access and Multi-Modal Site Circulation

The Training Center campus is bounded by KGB Road to the south, Cruiser Drive to the north, and Vine Road to the east. The Alaska Department of Transportation and Public Facilities (DOT&PF) is presently designing improvements for KGB Road and the portion of Vine Road that fronts the northeast side of the campus. This corridor currently experiences high congestion, poor traffic conveyance, and high collision rates due to limited capacity and a high density of connecting driveways, particularly during peak hours. Congestion issues are expected to increase, spurred by continued development along KGB Road and in the Point MacKenzie region, and significant population growth in the Matanuska-Susitna Borough as a whole. Construction of the roadway improvements is anticipated to begin in 2017.

The extent of the KGB Road improvements dictated the location of a new Fire Station 6-2 in order to accommodate multi-directional access to the roadways and maintain fire response times. Proposed roadway grades and setback distance from the KGB/Vine Road intersection will force the station to the southwest as far as possible within Training Center.

New driveways, or possibly narrow roadways, will enable access new facilities, props and fire training towers located around the Training Center campus. Where it intersects with Cruiser Drive, the north end of East Road may be re-aligned to the west to provide increased separation from the Cruiser/Vine intersection and facilitate site development. This action may enhance the beneficial usage of the narrow section of land between East Road and Vine.

Currently no trails or sidewalks are developed on the campus. New pedestrian facilities should be linked with a looped trail system that provides for fitness training, access to wildland fire training area, rope training area, and for transporting training materials and equipment to site props.

4.3 Water Well and Water Systems

Two types of water systems will serve the water needs of this Training Center.

- A single non-potable water system to serve the training areas.
- Individual potable well and water systems to serve the occupied buildings.

Developing independent water systems for the drinking water and fire training water will reduce the design complications associated with combining individual well pumps into a single piped distribution system on a booster pump system. The hydraulic balancing of two or more water systems together in combination with the expected various flow demands is a significant design and maintenance challenge.

Separating the water systems alleviates many safeguard and regulatory requirements specific to potable water systems. The non-potable water system is much larger in size and capacity and would therefore include a significant cost for maintenance and operation over the course its service life to

conform to potable drinking water standards. State of Alaska Department of Environmental Conservation (ADEC) will have regulatory authority for only the potable water system serving drinking water to the users.

4.3.1 Non-Potable Water System – Fire Training Water

The non-potable water system used for training evolutions and training areas and, ideally to supply the necessary water volume for the fire suppression system of the new Fire Station 6-2 and Training Facility. The basic components of this water system includes one or more high production water wells, a well house, an aboveground insulated water storage tank (WST) and the existing distribution system comprised of 4,300 linear feet of 10-inch HDPE water lines below the recently constructed East and West Roads.

The well(s), pump house, and WST are currently programmed for installation near the intersection of the Cruiser Drive and West Road. This location is ideal, featuring a flat topography that facilitates construction, an elevation considerably higher than all the training areas requiring water, and is a low-impact development with respect to the adjacent residential neighborhood.

The needed water storage tank volume is estimated to be a minimum of 200,000 gallons, based on Table 1, which summarizes the training water and reserve water needed for the new Station 6-2 and the Training Center fire suppression system. The volume of reserve water required for the fire suppression system of Station 6-2 is estimated at 15,000 gallons, based on previous projects of similar size and use. Final programming of campus water use will ultimately dictate this quantity.

The quantity of water needed for training exercises will likely grow as training evolutions increase, additional water wells are installed, and general water system improvements are made in the future. An example calculation below illustrates the water volume used during a typical training day. This example features a flow rate of 2000 gallons per minute using two-minute bursts that are repeated 10 times in a day for one exercise. Three separate exercises would occur at separate training areas or props in one day.

TABLE 1	
Example of Water Storage Volume Tank Sizing	
Criteria	**Daily Water Use/Volume**
Design Flow Rate	2,000 gallons per minute
Duration (2 minutes)	4,000 gallons
Frequency (10 times per day)	40,0000 gallons
Number of Training Groups (3 per day)	120,0000 gallons
Contingency Water Volume	35,000 gallons
Subtotal	155,0000 gallons
Reserve Water Storage for Station 6-2 Fire Suppression System	15,000 gallons
Reserve Water for Fire Emergencies (250 GPM for two hours per ISO)	30,000 gallons
TOTAL	**200,000 gallons**

The WST will be refilled when the water level drops below a preset threshold. The previous example follows a conservative approach, which begins refilling the WST at the end of a training day. After the training exercises consumed all 120,000 gallons of the allotted training water, the time needed to refill the WST would be about 5 hours, assuming a high production well flow of 400 GPM. If the maximum well production is only 200 GPM then the refilling time is nearly 10 hours. Likewise, for a well production that is 100 GPM, the refilling time is 20 hours.

Monitoring of the WST volume during training exercises should occur at regular intervals, if not continually, during the day to verify that the remaining water volume does not drop below the reserve or minimum amount needed for fire protection of the campus buildings and fire emergencies. A remote water level indicator and alarm could be installed to provide continuous monitoring.

The well house will serve as a control room for the submersible well pump(s) and contain the in-line booster pumps that will supply water to the distribution system downstream of the WST. The general water delivery method for this system, from source to point-of-use, would be:

1. Water well(s) with submersible pumps deliver water to the WST.
2. Water level of the WST would be controlled by internal floats and switches set at specific elevations as follows:
    a. Well pump number one "on."
    b. Well pump number two "on" (if high demand and if second well is developed).
    c. Alarm for low water level.
    d. Well pump number one and number two "off."
    e. Alarm for high water level.
3. Via a gravity pipe, water would convey out of the WST to the adjacent well house where it will be pumped into the distribution system.

4. The well house will contain single or variable speed booster pumps to pressurize the water system. The distribution system pressure would range from 60 to 80 PSI depending on location of use and the Fire Department's specific needs for training or fire protection.

The non-potable water system will require a detailed design for the operation of its several components, including its mechanical pumping system and balancing of the pressure system when large or small flow is experienced. Due to an elevation difference of nearly 85 feet, the distribution system will experience a pressure difference of about 35 PSI between the high point at the well house/WST and the lowest on-site hydrant, located near the Low Rise Commercial building. A pressure reducing valve may be needed to balance the entire distribution system to similar pressures to avoid the disparity of high pressures at the low elevation hydrants or a low pressure within the higher elevation hydrants. Ideally, the target system pressure ranges for the lower and upper elevation hydrants should be similar.

This water system would not be regulated by State of Alaska Department of Environmental Conservation (ADEC); however, establishment of water rights will be required by State of Alaska Department of Natural Resources (ADNR).

4.3.2 Potable Water System – Drinking Water

Domestic water for each future building would be provided by water wells serving individual water systems. These water systems would be regulated by ADEC since they would provide potable water to users. If the non-potable water system described above could not supply the required water storage for the campus fire protection system, then the potable system could fill belowground water storage tanks installed for each building's fire suppression system. This is a typical construction practice for many sprinklered buildings throughout the state when municipal or community water and sewer services are not available. Based on the final population served for each building, the water system is expected to be a Class 'C' or Class 'B' water system. A Class 'C' water system would be relatively simple to operate and would require limited regulation compliance. A Class 'B' water system is more complicated and will require regulatory water quality monitoring and require approval of the proposed design by ADEC before construction could begin.

The water well currently serving the existing Station 6-2 would remain in service and continue to serve this facility in the future. A new water well should be developed to serve the potable uses of the new Station 6-2 and Training Center facility.

4.4 On-Site Wastewater Systems

All buildings and facilities served by the campus potable water system will have a domestic wastewater system. Each wastewater system will consist of a septic tank and drain field for subsurface wastewater treatment and disposal. Septic tanks typically have a 5-foot diameter with a length varying between 8 and 16 feet, depending on the daily volume of conveyed to the wastewater system. All on-site wastewater systems are anticipated to convey less than 500 gallons a day, and will discharge by gravity. No pumping systems are anticipated. An analysis of the daily wastewater flow from each facility is typically performed during the construction documents phase of design. A typical leach field installation is expected to use a deep trench configuration due to the higher silt content of local soils,

which have slow percolation rates. Dimensions of the deep trenches also depend on daily wastewater volumes, but can range between 40 to 100 linear feet by 4 feet wide by 12 feet deep (from ground surface). A reserve area for a replacement drain field will be needed for each proposed installation.

4.5 Storm Water

Storm water routing will be conveyed primarily by sheet flow to dedicated on-site infiltration areas, naturally occurring low areas, and the use of drainage ditches for infiltration. Collection of training water and conveyance to these infiltration areas will be sufficient for water quality treatment given the minimal or absent amount of contamination within the runoff. Previous administrative decisions have established that flammable or combustible hydrocarbons will not be used for training events. The use of foam may occur on a non-regular basis and limited amount. The on-site infiltration areas will be sufficient for receiving this liquid.

4.6 Electrical Power

Three phase power service is available from the KGB Road overhead power facilities and will need to be extended to the new fire station and the southerly areas of the campus. Several transformers are needed for the new Station 6-2 and the southerly training areas. The mock subdivision, consisting of the single family house, multifamily housing, low rise commercial, Fire Investigators building, and Tactical Workshop and Technical Storage building will need limited interior lighting for the training exercises. Underground electrical service could extend from Station 6-2 to each of the southerly training areas that would also provide a central location to control the power and/or lights for a specific area or building. This benefit of a central power location within Station 6-2 to manage lighting needs provides time savings for training instructors by limiting their effort to visit each training location, better maintenance control, and manual override ability.

A second power service connection to the north will provide the power needs of the northerly training areas. Single phase power is available from the overhead power lines that parallel the north property boundary. It is assumed a single service would extend into the training campus from the pole nearest to Cruiser Street. This electrical service will supply power to the northerly training areas including site lighting for Driver Training Pad, lighting along West Road, and power for building services to the well house and controls building and the Remote Rehab Building. Multiple transformers will be installed along the West Road and within the training areas as needed.

5 Master Plan Site and Facility Programming

The campus has 6 major zones:

- Fire Station 6-2 and Training Center Building
- Mock Training Subdivision (Includes Live Fire Props)
- Drill Yard
- Driving Training Pad
- Water Storage Tank
- Wildland Training Area
- Future Development Areas

5.1 Fire Station and Training Center Building

The training site will serve three primary functions in addition to the training props and support buildings:

- Station 6-2 replacement
- Training Administration and Classroom spaces
- Warehouse Support space

The location of the Training Center building is largely a function of fire station access and response time requirements. Due to the KGB Rehabilitation Project realignment of the Vine Road intersection, a direct access from the campus to Vine Road will not be feasible. The driveway proximity to the KGB/Vine intersection would result in cars queued in front of the driveway, blocking access. As a result, it was decided that the fire station fronting KGB Road would be provided with a restricted-access median break to allow emergency vehicle full ingress/egress in both directions. The planned building location is programmed to maximize separation between the KGB/Vine Road and KGB/Sunset Avenue intersections and minimize the amount of fill and grade required for site development.

The vision for the Training Center building is to co-locate its three primary functions into wings of one building to maximize synergies between training activities, equipment, personnel, and to minimize downtime for instructors and cadets who would otherwise have to travel between separate buildings. This design also reduces operations and maintenance costs. The building is proposed to have one central public entry to facilitate wayfinding and maintain safety/security on a campus with active live fire training and an operational fire station. Access to the fire station and Training Center and Warehouse Support areas will be provided via a common lobby through secured doorways. The CMSFD has a 30-foot long antique fire truck that they would like to incorporate into the lobby design.

The new Fire Station 6-2 will have three drive-through apparatus bays with the 'back' bay doors accessing the training grounds and the 'front' bay doors facing KGB Road. Living quarters will accommodate twelve people.

The Training Center wing will house shared administration spaces, classrooms, and a fitness center. The Training Center classrooms should have direct access from the common lobby to accommodate public use after hours. Classrooms should be designed to have maximum flexibility and function as one,

two, or three separate classrooms using dividable walls. Each available classroom will have audio and visual capabilities and the spaces will be designed to accommodate a variety of chair and table layouts. A sprinkler lab is desired as part of the classroom. This would enhance the understanding of and familiarity with sprinkler systems and alarm systems.

The warehouse wing will primarily be used for storage of vehicles and training equipment. It will house one drive-thru apparatus bay that will be multi-functional and provide for a teaching environment (dirty classroom) when the vehicles are moved out of the structure. This indoor education space could be used for equipment demonstrations, laddering, rappelling, drafting, and other routine hands-on skills. The warehouse will also house a second drive through bay dedicated for fleet maintenance, which will require a separate oil and water separation system. A small office will be included for fleet maintenance staff.

The proposed program for each function is defined in more detail below and is based on extensive coordination with the CMSFD. In summary, the combined Fire Station, Training Center, and Warehouse Support spaces will be approximately 38,154 square feet (SF).

- Fire Station – 12,391 SF
- Training and Administration – 10,077 SF
- Warehouse Support -10,626 SF
- Shared Facilities and Building Services (Mechanical/Electrical) – 4,367 SF

It is expected that facility will be similar to Station 5-1; however, ultimate building project may vary from that shown in size, scale, and materials.

Photo 3 – Station 5-1

Photo 2 – A sprinkler lab and fire alarm (shown) in the classroom space allows students the opportunity to reset and test a variety of sprinkler systems. A variety of mock-ups provide firefighters, inspectors, installers, and engineers with hands-on experience in the design and operation of the systems.

TABLE 2 – Fire Station and Training Center Building Program						
Fire Station & Training Center Total Square				**38,154 SF**		
		QTY	**AREA (sf)**	**NET AREA (sf)**	**Subtotal (sf)**	**Notes**
Fire Station						Assumes one story
Fire Station Administrative						
	Office - Battalion Chief & Captain	1	160	160		Shared Officer Office
	Storage	1	80	80		
	Satellite Telecom Room	1	120	120		Optimize number of telecom rooms based on run distance.
	Radio Room	1	120	120		
	Subtotal - Administrative Area				480	
Fire Station Operations						
	Apparatus Bay - 3 drive-thru, 20' wide 100' deep	3	2000	6,000		Provide additional clearance, min 44" beyond outer bays, to provide access around perimeter when apparatus doors are open.
	Clean up /Decon/Extractor/Dryer and Shower/restroom	1	300	300		Shared space for Decon/Extractor/Dryer storage and Decontamination shower/restroom
	Fire Locker/Gear Storage	36	10	360		
	Fire Supplies Storage	1	240	240		
	Maintenance / Small Tool Workshop	1	120	120		
	SCBA Fill Station / Bottle Storage	1	240	240		
	Hose Washer & Dryer Storage	1	120	120		
	Apparatus Bay Janitorial	1	64	64		
	Subtotal - Operations				7,444	
Fire Station Living Quarters						
	Individual Sleep Rooms	12	99	1,188		1 person per room
	Individual Restroom/Showers	3	96	288		
	Linen Closet	1	15	15		
	Kitchen	1	240	240		To support 3 shifts (3 refrigerators). Design in proximity to training rooms
	Pantry	1	80	80		
	Dining	1	200	200		
	Dayroom	1	600	600		
	Fitness	0	400	0		Shared use of facility located in Training
	Laundry Room and Janitorial	1	160	160		
	Storage	1	80	80		
	Subtotal - Living Quarters				2,851	
	Subtotal - Fire Station				**10,775**	
	Allowance for Walls & Circulation		15%	1,616		

	Replacement Fire Station Total				12,391	
	Table 2, cont.	**QTY**	**AREA (sf)**	**NET AREA (sf)**	**Subtotal (sf)**	**Notes**
Training & Administration						
Training Offices						
	Reception Desk / Area	1	120	120		Connected to main Public Lobby to serve the entire facility
	Offices	2	120	240		120 SF per office allows meetings with 2 or 3 persons in the office
	Open Office	1	400	400		Accommodates 4 10 x 10 work stations.
	Subtotal - Training Offices				760	
Training Support Spaces						
	Work/Mail/Copier Room	1	200	200		Accessible to both Fire Station and Training
	Main Telecom	1	160	160		In addition to Main Telecom room, optimize satellite Telecom rooms based on run distance. At a minimum provide a Main Telecom Room in the Training portion of the building and a satellite in the Fire Station.
	Lunch Room / Break Room	1	160	160		Provide sink, microwave, fridge, min 2'x6' of clear counter space.
	Subtotal - Training Support Spaces				520	
Classroom and Meeting Spaces						
	Restrooms - Men	1	400	400		Design in proximity to training area and warehouse. Assumes 5 lavs, 5 toilets for each. Subject to code review for fixture requirements.
	Restrooms - Women	1	400	400		
	Dividable Classroom(s) (Use Moderfold acoustic wall or equivalent)	1	3750	3750		Divisible into 3 rooms (2 @ 1500 each, 1@ 750 sf). Large rooms: accommodate 50 students paired at desks. Small room: 25 at paired at desks. Provide floor boxes with power and telecom to each pair of students.
	A/V Equipment & Storage for Classrooms	3	45	135		Assumes each of the classrooms has a closet measuring 3' deep by 15' wide.
	Teaching Laboratory	1	800	800		Laboratory w/wet work benches for 20.
	Coffee/Snack Area	1	160	160		Located in close proximity to Classrooms. Provide sink and min 12' of counter with cupboards below and above.
	Storage - Chairs/Table	1	240	240		Located in close proximity to Classrooms.
	Subtotal - Classroom and Meeting Spaces				5,885	
Fitness Center						
	Fitness / Cardiovascular Room	1	1000	1,000		
	Locker Room / Shower - Women	1	600	600		For each, provide min 2 toilets, 2 lavs, 2 individual ADA showers, plus min 300 sf dressing area w/benches and min 30@12x12x36 lockers
	Locker Room / Shower - Men	1	600	600		
	Subtotal - Fitness Center				2,200	
	Subtotal - Training				**9,365**	
	Allowance for Walls & Circulation		15%	1,405		

	Training Total				**10,770**	
	Table 2, cont.	**QTY**	**AREA (sf)**	**NET AREA (sf)**	**Subtotal (sf)**	**Notes**
Warehouse/Support Area						
	Apparatus Bay -drive-thru, 100' deep to stage training vehicles	1	2000	2000		Provide additional clearance, min 44" beyond outer bays, to provide access around perimeter when apparatus doors are open.
	Fleet Maintenance Bay -drive-thru, 100' deep x 24 feet wide	1	2400	2400		Provide additional clearance, min 44" beyond outer bays, to provide access around perimeter when apparatus doors are open
	Office	1	120	120		120 SF per office allows meetings with 2 or 3 persons in the office
	Storage - 1st level Training Equipment and Supplies	1	3000	3000		Located below mezzanine. Min 9' clear height and 250 psf loading.
	Storage -Mezzanine	1	2000	2000		Min 9' clear height and 150 psf loading.
	Restrooms (Single, unisex)	2	70	140		Easily accessible to students involved in outside training.
	Subtotal: Training Support Building				9,660	
	Allowance for Walls & Circulation		10%	966		
	Total Warehouse Support Building				**10,626**	
Shared Facilities and Building Services						
Common Lobby/Entry						
	Public Lobby/Museum Space	1	800	800		Common lobby is shared between Fire Station, Admin and Training with secure access to each. Direct access from the common lobby to the dividable classrooms is desired to accommodate public use after hours. Lobby is sized to include 30' long antique fire truck.
	Arctic Entries	2	200	400		Actual number may vary. All primary staff and public entries to have an arctic entry.
	Reception Desk / Area	0	120	0		See reception desk located in Training and connected to Public Lobby
	Visitor Restrooms	2	70	140		Subject to code review for fixture requirements
	Restroom vestibule, drinking fountains	1	70	70		
	Subtotal - Common Lobby/Entry				1,410	
Building Services						
	Boiler/Mechanical	1	480	480		
	Electrical	2	120	240		Additional satellite electrical closets may be required depending on configuration.
	Fan Room	2	800	1600		Assumes 1 room each for Fire Station and Training; may be combined depending on configuration
	Compressor Room	1	120	120		
	Fire Pump	1	120	120		

	Generator	1	0	0		Assumes skid-mounted exterior generator.
	Subtotal: Building Services				2,560	
	Subtotal - Shared Facilities and Building Services				**3,970**	
	Allowance for Walls & Circulation		10%	397		
	Total Shared Facilities and Building Services				**4,367**	

5.2 Repurposing of Original Station 6-2

When the new fire station is completed, the original 4,200 SF building that housed Station 6-2 can be repurposed. It can immediately be used to house training apparatuses, snow removal, and other vehicles assigned to the training campus, as well as supplies and other equipment in support of the training environment. Doing so will be an economic reuse of an existing structure that requires no significant investment.

As additional funding becomes available, there is an opportunity to convert the existing community room into a firefighter maze and/or confidence course. Overhead doors could also be installed at the back of the existing apparatus bays for connectivity to the training grounds immediately to the north. The heating and ventilation system is aging and will need to be upgraded.

Photo 4

5.3 Mock Subdivision/Community

Photo 5 – Chester County (PA) Tactical Village

Arranged as a typical subdivision, the training community provides an opportunity for all first responder disciplines to undertake practical training - separately and combined. The combination of training buildings and training pads allow the first responders to set up many different scenarios to hone their skills of the entire emergency response process from initial site response, entry, and emergency action, to removal and exit. When laying out the subdivision, it is important to limit open space around each element, and to provide critical contextual features necessary to develop command decision making skills. Obstacles, such as the curb and gutter, sidewalks, hydrants, street signs, poles, and cables simulating overhead power lines are typically added to provide realistic challenges. One of the goals of the plan was to increase the density of development to more accurately depict realistic contexts providing greater opportunities for command decision making challenges.

Photo 6 – Mock power lines and street signs

The fire training subdivision development would be phased over time. The Master Plan provides a subdivision site and one potential layout for the community; however, the ultimate layout will depend on the types and acquisition sequence of the training building, towers, and props. New live fire training towers and drill towers are expensive and will likely be added within the Phase 3 planning period, which is 10 or more years out. Given the rapid growth in the MSB and changing firefighting and training technologies, it is difficult to predict the exact training tower mix that will best meet the future needs. The construction material of the buildings would resist multiple burning events and likely consist of metal or concrete. The building foundation is considered a cold foundation requiring specific design and construction to avoid adverse settlement.

For Phase 1 of the mock subdivision, it is recommended that the existing Station 6-2 drill tower be relocated to the training community site. The construction of the new Station 6-2 Fire Station project will displace this training tower and, because disassembly and relocation have cost implications, it is preferred that the tower becomes the first structure in the tactical subdivision so it only has to be relocated one time. The tower has been sited at the west end of the proposed mock subdivision and adjacent to the new Fire Station/Training Center to potentially take advantage of fill and grade work as part of that development. The tower pad could also be oversized to accommodate live fire prop pads. Ideally, the proposed "subdivision road" within the mock community would also be constructed to facilitate on-site circulation and future development.

Additional training buildings, props, and support facilities to be located in the subdivision are generally described below. It is important that future fire training towers and structures be designed to provide training drills that meet certification requirements, user needs, and incorporate the latest technologies to facilitate realistic training scenarios and ease of maintenance.

5.3.1 Fire Investigators Building

A small facility for fire investigation training is needed. The Fire Investigators Building will be a connex-type of structure that can be fitted with interior metal studs/GWB as needed for the situation. One to two sprinkler heads will be provided for use with gate valve and full drain-down, fed from a truck or hydrant system.

Photo 7

Photo 8

5.3.2 Tactical Training Towers

Structures provide for multiple training scenarios including laddering, rappelling, confined space, rescue, SCBA awareness, etc. Typically, they have paving on all four sides to allow apparatus to maneuver around the tower. The training tower should have portals for ducting to smoke machines or connection to portable salamander heaters when heat is needed during winter training to eliminate ice on floor surfaces.

Photo 9

5.3.3 Low Rise Commercial Structure

The live fire commercial training tower is a 7,000 SF building, which will have three floors designed to simulate multiple low-rise commercial occupancies – office buildings, warehouse, strip mall, retail, industrial occupancies, and parking garages. The building will have several propane-fired burning props, designed to meet NFPA standards

for a safe training environment. In addition to teaching fire behavior and extinguishing, this structure will provide training scenarios for hose evolutions, smoke evacuation, standpipes, sprinklers, search and rescue, and incident command.

5.3.4 Residential Structures

Five residential live fire training structures of about 2,000 SF each would simulate a variety of residential occupancies replicating a subdivision scenario. Each building would simulate different configurations – single family ranch, single family with walk-out basement, townhouse/garden apartments, and 4-plex multi-family residential. Garages and possibly a small neighborhood commercial building should also be considered.

With multiple floors and access points, these structures would be designed to support Class A live fires (straw bales and/or wood pallets), as well as propane props supporting the possible use of extinguishing foam. All burn rooms shall meet NFPA standards for a safe training environment. The building will be designed specifically for teaching fire behavior and extinguishing in residential scenarios. Ventilation props can be incorporated into the roofs of the residential burn buildings.

Photo 10 –- Existing site topography provides opportunities to provide at-grade access to different floors on opposite sides of the building. Some buildings replicate a single family residential layout with garage, living, family, and kitchen with bedrooms on the second floor accessed by an interior stairway. The back replicates a garden style apartment or hotel layout with both an interior stairway and external stairs and walkways.

5.3.5 Training Pads and Live Fire Props

Concrete training pads with propane fuel sources should be incorporated into the training subdivision. A combination of permanent and portable propane tanks and distribution systems for movable propane props with quick couplings is desired.

Pads will support a variety of permanent and/or mobile props to allow for maximum flexibility in training scenarios.

Photo 11

Propane fired props simulate scenarios such as car fires, residential propane tanks, dumpster fires, BBQ, helicopter, and/or small aircraft fuselage.

Photo 13

Photo 12

5.3.6 Tactical Workshop and Technical Storage

An outdoor storage 40 x 40 SF paved and covered area, with space to construct/assemble and store props is desired in the short-term with the long term goal of having a heated and enclosed workshop.

5.3.7 Rehab Pavilion

This facility would serve as a rest area/gathering place during trainings.

Photo 14 – One option for an envisioned rehab pavilion

5.4 Driver Training Pad

Driving training for fire personnel and possibly law enforcement will be accomplished with the combination of a large paved area and the East and West Roads. The driver training pad is simply a large wide-open asphalt pavement pad used for several types of training opportunities in addition to emergency vehicle driver training. Development of the driver training area will require construction of mild or shallow grade slopes to promote better functional uses for the several types of training uses. A substantial quantity of storm runoff or training water will sheet convey to the low end of this area which will require adequate sizing and space allotment for a retention pond or basin. Lighting is critical to provide considering training will occur in the evening hours.

Photo 15

In addition, the existing asphalt East and West Roads and future roadway through the training village include a variety of grades and turning radii that can be used for driver training. The road network could incorporate guardrails, telephone poles, crosswalks, and speed limit signs to add realism and the opportunity to stage mock accidents and rescue scenes.

5.4.1 Auto Extrication

The driver training pad will also serve as an auto extrication training pad. Auto extrication training addresses how to safely extricate victims of automobile accidents from their vehicles, as well as how to provide emergency medical treatment during those extrications. Thirty vehicles are delivered at a time and used during a five week training class. For smaller auto extrication classes, pads in the training village can also support this training activity.

Photo 16

Photo 17

Additionally, auto extrication training can be accommodated on training pads in the tactical village and along campus roadways to simulate more realistic scenarios.

Photo 18

Photo 19

5.4.2 Helipad

The helipad location will take advantage of the Driver Training area wide expanse that is generally flat or shallow grades, which is similar to that of a typical helipad landing zone. The helipad will only be used for emergency use to transport victims directly to hospital facilities and will not be FAA approved. A wind sock located on edge of asphalt will provide wind direction for the pilot.

5.5 "Remote" Rehab Building

This approximate 2,200 SF structure will provide trainees with a place out of the elements prior to, during, and after, training exercises, located remotely from the main training center. The primary purpose would provide shelter for "rehab", specifically, a place for hydration, nutrition, blood pressure checks, equipment checks, and other safety procedures. The facility can be used as outdoor classrooms with whiteboards and instruction materials for pre-briefing and de-briefing training exercises. If heated, structure could include restrooms and general storage for training prop consumables, supplies, and equipment. Overhead doors will open to the exterior.

Photo 20 – Anticipated building character shown for representational purposes only; ultimate building project may vary from that shown in size, scale, and materials.

Photo 21

Photo 22

5.6 Non-Live Fire Site Training Props

Non-live fire props provide training opportunities for real-world training situations that are often encountered in the response area. They also train responders for unique situations not frequently encountered. Both are important – frequently encountered hazards require training to sharpen skills and develop more efficient response tactics. Unique situations require training as they are infrequently encountered and can pose unexpected hazards.

Site props can be purchased, built on site with local materials/labor, and donated by industry partners as noted in the Potential Partnerships section. For master planning purposes, most simply require space allocation in a logical, efficient manner and the props can be developed over time. It is expected that non-live fire props will be placed in the designated Drill Yard or the Training Subdivision depending on phasing and funding. Props that are more space intensive and require more extensive infrastructure are described below. Other non-live fire props such as forcible entry doors and wall breach props.

5.6.1 Rope Training

Rope training is for search and rescue activities on low-angle terrain. Existing topography and the undeveloped natural terrain in the center of the campus can be used, perhaps augmented with fill to achieve desired slope(s). The site would provide steep rescue—not vertical rescue—training.

Photo 23

Photo 24

5.6.2 Aerial Training

Low angle, long reach rescue training for large floor plate buildings, and hose stream from an aerial platform will be conducted. Most training towers are not realistic structures for apparatus placement and aerial operations. There's usually a wide open pad; the standpipe connection and the hydrant are always in the same locations, always accessible; and there is typically access on four sides of the building. For a more realistic scenarios, aerial training areas should include overhead obstructions such as mock power lines and existing trees.

Photo 25

Aerial training can occur in the training village and along the East/West Roads where trees can be used as obstacles.

5.6.3 Site Ventilation Prop

The ventilation prop is a site-built, heavy timber structure for the purpose of training proper roof cutting, ventilation, and safety procedures. Additional ventilation props should be provided on roofs of burn buildings after the base skills are learned on the ground. The on-site topography allows a low rise structure to be built. Typically greater than 30 inches above grade so the requirement for handrails is minimized, the structure should follow the slope of the terrain, and be built over a concrete pad for easy cleanup. Another option is to build the props over a constructed earthwork mound.

The cut-out areas are sized for easy to replace plywood sheathing in 4x4 SF or 4x8 SF panels. At the cut-out areas the sacrificial 2x rafters are set in slots on each end for ease of replacement.

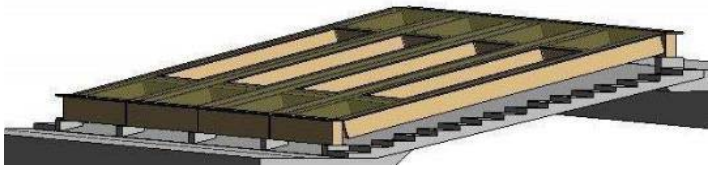

Photo 26

Photo 27

Photo 28

Above ground structures can include a garage door prop, wall strip, and Denver drill.

5.6.4 Aircraft Prop

A small plane, one or two engine aircraft prop should be provided for rescue training. Prop could be placed in a number of altitudes in a variety of locations on the training campus.

Photo 29

5.6.5 Storage Tank Prop

The new 200,000 gallon water storage tank (WST) that will provide fire training water for the campus also provides an opportunity for mock drills and tank rescue training. To simulate a fuel tank response, a containment vault/dike could be provided around the tank for response drills.

Photo 30

Photo 31

5.6.6 Haz-Mat Training

Hazardous material training is the spill response/containment of transportation vehicles, rail cars, and trucks. Response training must address a number of hazardous material issues, including fire, corrosives, acids, oxidizers, etc. A concrete training pad with room for overturned vehicles, including passenger cars and a truck, should be used. The pad requires containment around the perimeter. For training, the ability to have a tanker tipped on its side, with water flow to a depression in the pad that simulates a ditch, is desired for training to set up containment dikes.

5.6.7 Wildland Fire Training and All -Terrain Vehicle (ATV) Trails

The campus provides significant opportunities to take advantage of natural forested areas to provide wildland fire training and ATV driver training. A network of primitive trails (unpaved) provide realistic ATV driving courses and can also be used as fitness trails. For this reason, preservation of large expanses of forested areas should be a priority for the training center.

5.6.8 Low Priority Props

It was noted by fire department personnel that many props would come in a future phase of implementing the master plan, since there are adequate training facilities in the region and the training is not in as high of demand.

Confined Space Prop

The confined space prop is a series of utility vaults and interconnected pipes used to practice technical rescue techniques below grade and in tight spaces.

Photo 32

Photo 33

Trench Rescue

The trench rescue prop simulates technical rescue environments with unstable earth conditions, which may be encountered on construction sites or during the installation of underground utilities.

Photo 34

Photo 35

Collapse Prop

The collapse prop provides technical rescue training in a post-earthquake scenario with collapsed floors, roofs, and leaning walls in unstable conditions. At this time MSB training is for awareness only. If a building collapse prop is provided, it should be designed around the local target hazard of wood frame structures.

Photo 36

Photo 37

Urban Search and Rescue

Essentially a pile of concrete rubble and building debris, the urban search and rescue prop provides the opportunity to train for technical rescue operations, post-earthquake, to safely locate and extract victims.

Photo 38

Ice/Water Rescue Training

Ice/Water Rescue Training will continue to be performed off-site at area lakes.

6 Master Campus Plan Phasing and Cost Estimate

The development of fire training center will occur in a phased manner as funds become available, grants secured, partnerships established, and potential revenue streams developed. The primary funding streams currently consist of State and MSB revenues, with the possibility of smaller funding coming through the private sector, or other local governments who could benefit from the training station forming partnerships with MSB.

The timing and amount of revenue available for further site developments is unknown given the current economic climate in Alaska. Local government and State of Alaska budgets currently have reduced funds for capital projects. Capital spending for large projects is expected to be slow for the next few years due to reduced funding available and a more competitive environment to secure the available funding. However, this planning anticipates an eventual rebound of the State's budget, and coupled with MSB revenue, should create the basis for the full development of the training campus.

The matrix below identifies three phases of development based on a timeline beginning in 2017. A rough order magnitude (ROM) estimate of construction cost for each phase provides an overview of the likely costs expected with the proposed development. However, this matrix does not summarize a solidified time line of actual construction. It instead provides the MSB with a menu of options from which to select and develop projects based on priorities and specific needs of the CMSFD.

The ROM costs are in 2017 dollars and should receive an escalation value when determining the cost for future years.

TABLE 3 – Order of Magnitude Construction Cost Estimate				
Phase 1: Years 1 to 3				
		Timeline	**Order of Magnitude Cost**	**Comments**
1	Water Storage Tank, Well House and Driveway	2017	$1,020,000	Includes gas and electric utility connections extension from Admiralty and Cruiser Drive.
2	Relocation of Training Tower	2018	$530,000	Includes site preparation, paving and electric.
3	New Fire Station 6-2, Training Center, and Warehouse Support Building	2018-2019	$11,500,000	Includes parking lot, fencing, on-site water and wastewater system. Includes new gas and electric service connections.
4	Rehab of Existing Station 6-2	2019	$210,000	Includes; interior space remodel for training, electrical and mechanical upgrades
	Phase 1 Order of Magnitude Total Cost		**$13,260,000**	
Phase 2 – Years 3 to 10				
		Timeline	**Order of Magnitude Cost**	**Comments**
1	Driver Training Pad	2020	$2,200,000	Includes two driveways, site prep, electric extension and onsite lighting.
2	Live Fire Props	2020-2024	$400,000	Three props for Phase 2. Includes site prep, and utilities. Training vehicle prop by CMSFD.
3	Single Family Housing Structures	2020-2026	$1,200,000	Three structures for Phase 2. Includes driveway access to entire Mock Subdivision and looped water pipe extension. Electric utility extension.
4	Rehab Pavilion	2022	$185,000	Includes site prep
5	Drill Yard: Non-Live Fire Props: Force Entry Doors and Wall Breach Non-Live Fire Props: Site Ventilation Props	2020-2025	$285,000	One of each, total of two. Includes site preparation.
	Phase 2 Order of Magnitude Total Cost		**$4,270,000**	

TABLE 3 cont.				
Phase 3: Year 10 and beyond				
		Time line	**Order of Magnitude Cost**	**Comments**
1	Additional Single Family Housing	2027-2033	$445,000	Includes two additional for Phase 3. Includes site preparation
2	Fire Investigators Building	2027	$476,000	Includes site preparation
3	Tactical Workshop & Technical Storage	2027	$200,000	Assumes most site prep occurred under Phase 2 – Drill Yard improvements
4	Multi-Family Housing	2028	$1,030,000	Includes site preparation
5	Low Rise Commercial	2029	$575,000	Includes site preparation
6	Remote Rehab Building	2030	$720,000	Includes gas and electric utility connections and site preparation.
7	Drafting Pond	2030	$195,000	Includes drive access and site prep.
8	Trench Rescue	2032	$310,000	Includes site prep and electric utility
9	Collapse Prop	2032	$430,000	Includes site prep and electric utility
10	Urban Search and Rescue	2033	$280,000	Includes site prep and electric utility
11	Confined Spaces	2033	$350,000	Includes site prep and electric utility
12	Wildland Rescue	2017-2033	$120,000	Trail and access development. Trailhead parking
13	Steep Terrain and Rope Rescue	2007-2033	$25,000	Trail and access development
14	Steep Terrain and Rope Rescue	2007-2033	$134,000	Includes perimeter trails and site fencing along Cruiser Drive
	Phase 3 Order of Magnitude Total Cost		**$5,290,000**	
	Total Phase 1, 2 and 3 Order of Magnitude Cost		**$22,820,000**	2017 Dollars

APPENDIX A

Order of Magnitude Construction Cost

HMS Project No. 15058

CONCEPT DESIGN SUBMITTAL
CONSTRUCTION COST ESTIMATE (REVISION 2)

CENTRAL MAT-SU FIRE TRAINING CENTER
MASTER PLAN SITE DEVELOPMENT AND IMPROVEMENTS
OFF KNIK GOOSE BAY ROAD - WASILLA, ALASKA

PREPARED FOR:

CRW Engineering Group, LLC
808 South Bailey Street, Suite 104
Palmer, Alaska 99645

July 18, 2016

4103 Minnesota Drive • Anchorage, Alaska 99503 p: 907.561.1653 • f: 907.562.0420 • e: mail@hmsalaska.com

HMS Project No.: 15058

NOTES REGARDING THE PREPARATION OF THIS ESTIMATE

DRAWINGS AND DOCUMENTS

Level of Documents:	(3) concept design drawings and systems narratives
Date:	May 3, 2016
Provided By:	CRW Engineering Group, LLC of Palmer, Alaska

RATES

Pricing is based on current material, equipment and freight costs.

Labor Rates:	A.S. Title 36 working 60 hours per week
Premium Time:	16.70%

BIDDING ASSUMPTIONS

Contract:	Standard MSB construction contract without restrictive bidding clauses
Bidding Situation:	Competitive bids assumed
Bid Date:	Spring 2017
Start of Construction:	Summer 2017
Months to Complete:	Varies with each work area of construction
Construction Time:	Varies with each work area of construction

EXCLUDED COSTS

1. A/E design fees
2. MSB administrative and management costs
3. Owner furnished equipment and furnishings (FFE)

NOTES REGARDING THE PREPARATION OF THIS ESTIMATE (Continued)

GENERAL

When included in HMS Inc.'s scope of services, opinions or estimates of probable construction costs are prepared on the basis of HMS Inc.'s experience and qualifications and represent HMS Inc.'s judgment as a professional generally familiar with the industry. However, since HMS Inc. has no control over the cost of labor, materials, equipment or services furnished by others, over contractor's methods of determining prices, or over competitive bidding or market conditions, HMS Inc. cannot and does not guarantee that proposals, bids, or actual construction cost will not vary from HMS Inc.'s opinions or estimates of probable construction cost.

This estimate assumes normal escalation based on the current economic climate. While the global economic downturn appears to be moderating, it remains unclear how its effects and subsequent economic recovery will affect construction costs. HMS Inc. will continue to monitor this, as well as other international, domestic and local events, and the resulting construction climate, and will adjust costs and contingencies as deemed appropriate.

Review comments and mark-up estimate changes have been incorporated into this submittal.

GROSS FLOOR AREA

With General Cost Summary.

HMS Project No.: 15058

CONCEPT DESIGN GENERAL COST SUMMARY (REVISION 2)

	Total	*Cost/SF*	*Area*
1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)	$ 11,219,980	$ 303.24 /SF	37,000 SF
2. TRAILS, ACCESS, DRAFTING POND, FENCING, REPURPOSE EXISTING BUILDING, ETC.	502,552	8.01 /SF	62,726 SF
3. TRAINING TOWER SHOP, INVESTIGATOR BUILDING, ETC.	1,504,810	90.22 /SF	16,680 SF
4. FIRE TRAINING MOCKS SUBDIVISION (5 EACH)	2,978,377	160.65 /SF	18,540 SF
5. LIVE FIRE PROPS YARD (4 EACH)	404,762	6.01 /SF	67,350 SF
6. REMOTE REHAB BUILDING	713,767	324.44 /SF	2,200 SF
7. WATER WELL, WATER STORAGE TANK AND WELLHOUSE/CONTROLS BUILDING	993,240	63.34 /SF	15,680 SF
8. WORK SHOP, DRILL YARD, VENTILATION AND FORCIBLE ENTRY BREACH	485,512	5.24 /SF	92,710 SF
9. DRIVER, HELIPAD AND AERIAL TRAINING AREAS	2,130,284	8.23 /SF	258,746 SF
10. URBAN RESCUE CONFINED SPACES, TRENCH RESCUE AND COLLAPSE PROPS	783,902	6.30 /SF	124,397 SF
TOTAL ESTIMATED CONSTRUCTION COST (BID 2017*):	***$ 21,717,186***	***$ 31.20 /SF***	***696,029 SF***

* Note: For estimating purposes, all buildings and structures are priced for 2017 competitive bids. Costs will change depending on actual year of construction by adding an inflation factor. Unit costs reflect buildings or site improvements areas.

HMS Project No.: 15058

1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)

CONCEPT DESIGN COST SUMMARY (REVISION 2)

	Material	*Labor*	*Total*
01 - SITE WORK			
Site Preparation and Improvements	$ 532,193	$ 541,134	$ 1,073,327
Site Mechanical	62,939	51,805	114,744
Site Electrical	65,555	59,666	125,221
02 - SUBSTRUCTURE	289,394	336,133	625,527
03 - SUPERSTRUCTURE	351,926	343,229	695,155
04 - EXTERIOR CLOSURE	400,027	171,943	571,970
05 - ROOF SYSTEMS	546,758	263,933	810,691
06 - INTERIOR CONSTRUCTION	403,754	413,567	817,321
07 - CONVEYING SYSTEMS	0	0	0
08 - MECHANICAL	918,970	1,043,393	1,962,363
09 - ELECTRICAL	513,809	574,698	1,088,507
10 - EQUIPMENT AND FURNISHINGS	92,598	31,290	123,888
11 - SPECIAL CONSTRUCTION	0	0	0
SUBTOTAL DIRECT WORK:	*$ 4,177,923*	*$ 3,830,791*	*$ 8,008,714*
12 - GENERAL REQUIREMENTS			1,466,212
SUBTOTAL:			*$ 9,474,926*
13 - CONTINGENCIES			1,745,054
TOTAL ESTIMATED CONSTRUCTION COST:			***$ 11,219,980***

HMS Project No.: 15058

1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
01 - SITE WORK	*QUANTITY*	*UNIT*	*RATE*	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
Site Preparation and Improvements			*$*	*$*	*$*	*$*	*$*	*$*
PREPARATION								
Site survey and staking	3.10	AC	750.00	2,325	6000.00	18,600	6750.00	20,925
Erosion and pollution control	107,200	SF	0.03	3,216	0.07	7,504	0.10	10,720
SWPPP requirements and maintenance	1	LOT	1500.00	1,500	2500.00	2,500	4000.00	4,000
Traffic control, barriers, signage, etc.	3	MOS	800.00	2,400	1200.00	3,600	2000.00	6,000
Boundary fencing	1	LOT						Existing
EARTHWORK								
Clear site of shrubs	3.10	AC			6000.00	18,600	6000.00	18,600
Excavate and dispose organics on site, average 24" deep	9,990	CY			5.20	51,948	5.20	51,948
Average 18" deep NFS fill, compacted	8,990	CY	14.50	130,355	7.50	67,425	22.00	197,780
Soil compaction tests (1 per 500 CY)	18	EA	225.00	4,050			225.00	4,050
IMPROVEMENTS								
AC Pavements								
4" D1 leveling course, compacted	1,995	CY	19.00	37,905	8.00	15,960	27.00	53,865
3" AC pavements (2,285 tons)	130,580	SF	1.55	202,399	1.15	150,167	2.70	352,566

HMS Project No.: 15058

1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
01 - SITE WORK	*QUANTITY*	*UNIT*	*RATE*	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
Site Preparation and Improvements			*$*	*$*	*$*	*$*	*$*	*$*
IMPROVEMENTS (Continued)								
AC Pavements (Continued)								
Match existing KGB Road	130	LF	2.70	351	3.50	455	6.20	806
Mark 50'0" fire truck stalls	8	EA	22.00	176	30.00	240	52.00	416
Mark 20'0" wide vehicle stalls	160	EA	18.00	2,880	25.00	4,000	43.00	6,880
Mark ADA symbol	1	EA	20.00	20	35.00	35	55.00	55
Cross hatch markings	163	SF	0.55	90	0.60	98	1.15	188
ADA sign, building mounted	1	EA	70.00	70	40.00	40	110.00	110
Way finding traffic signs, posts and bases	4	EA	150.00	600	130.00	520	280.00	1,120
Curbs, Pads, Bollards, Fencing and Culverts								
6"x8"x8'0" precast concrete wheel stops anchored to pavement at building	19	EA	87.00	1,653	55.00	1,045	142.00	2,698
Concrete curbs and gutters	1,555	LF	13.50	20,993	14.70	22,859	28.20	43,852
6" reinforced concrete utility pads (2)	52	SF	5.70	296	4.85	252	10.55	548
6" diameter x 84'0" long concrete filled painted pipe bollards embedded in 24" diameter x 42" concrete bases at overhead doors, etc.	10	EA	575.00	5,750	380.00	3,800	955.00	9,550

HMS Project No.: 15058

1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
01 - SITE WORK	*QUANTITY*	*UNIT*	*RATE*	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
Site Preparation and Improvements			*$*	*$*	*$*	*$*	*$*	*$*
IMPROVEMENTS (Continued)								
Curbs, Pads, Bollards, Fencing and Culverts (Continued)								
8'0" barbed wire fencing, rails, posts and concrete bases	254	LF	39.75	10,097	14.50	3,683	54.25	13,780
Tie new fencing into existing	2	EA	30.00	60	55.00	110	85.00	170
20'0"x8'0" cantilevered gate, posts and bases	2	EA	2750.00	5,500	990.00	1,980	3740.00	7,480
18" diameter CPEP culvert including trenching	60	LF	16.30	978	10.50	630	26.80	1,608
18" flare ends	2	EA	123.00	246	140.00	280	263.00	526
Landscaping								
Landscape bedding with shrubs and bark mulch	7,080	SF	1.25	8,850	1.10	7,788	2.35	16,638
Revegetate disturbed areas	10.20	MSF	72.00	734	225.00	2,295	297.00	3,029
SUBTOTAL:				*$ 443,494*		*$ 386,414*		*$ 829,908*
Labor Premium Time	16.70%					64,531		64,531
SUBTOTAL:				*$ 443,494*		*$ 450,945*		*$ 894,439*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			88,699		90,189		178,888
TOTAL ESTIMATED COST:				***$ 532,193***		***$ 541,134***		***$ 1,073,327***

HMS Project No.: 15058

1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
01 - SITE WORK	*QUANTITY*	*UNIT*	*RATE*	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
Site Mechanical			*$*	*$*	*$*	*$*	*$*	*$*
WELL SYSTEM								
Develop 6" diameter x 150'0" deep potable water well system	1	EA	18500.00	18,500	9750.00	9,750	28250.00	28,250
20 GPM, 2 HP submersible water pump	1	EA	2450.00	2,450	1400.00	1,400	3850.00	3,850
24" diameter x 48" deep well head insulated barrel and cap	1	EA	880.00	880	455.00	455	1335.00	1,335
2" pitless adaptor connection	1	EA	125.00	125	110.00	110	235.00	235
2" diameter SDR11 insulated jacketed pipe and fittings including trenching	120	LF	12.70	1,524	15.20	1,824	27.90	3,348
2" building connection and sleeve	1	EA	87.00	87	110.00	110	197.00	197
Test and disinfect well	1	LOT	150.00	150	650.00	650	800.00	800
SEPTIC SYSTEM								
Excavate and backfill to develop deep trench septic field (+/- 8'0" deep)	285	CY	13.00	3,705	20.00	5,700	33.00	9,405
100'0"x3'0"x8'0" deep sewer rock infiltration trench (1)	89	CY	82.00	7,298	20.00	1,780	102.00	9,078
4" header pipe manifold and fittings	136	LF	7.70	1,047	10.50	1,428	18.20	2,475

HMS Project No.: 15058

1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
01 - SITE WORK	*QUANTITY*	*UNIT*	*RATE*	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
Site Mechanical			*$*	*$*	*$*	*$*	*$*	*$*
SEPTIC SYSTEM (Continued)								
2,000 gallon buried septic tank complete with manhole, vents, etc.	1	EA	6750.00	6,750	1450.00	1,450	8200.00	8,200
4" diameter HDPE piping	120	LF	5.80	696	7.70	924	13.50	1,620
4" rigid insulation over piping and tank	680	SF	1.75	1,190	0.90	612	2.65	1,802
4" building connection and sleeve	1	EA	90.00	90	135.00	135	225.00	225
4" tank and leach field connections	3	EA	70.00	210	110.00	330	180.00	540
4" cleanout	1	EA	330.00	330	250.00	250	580.00	580
4"x10'0" perforated/solid wall monitoring tubes with caps	4	EA	135.00	540	150.00	600	285.00	1,140
Test system	1	LOT	50.00	50	350.00	350	400.00	400
6" diameter under road boring and casing	40	LF	48.00	1,920	135.00	5,400	183.00	7,320
NATURAL GAS								
3" gas regulator and meter	1	EA	1850.00	1,850	770.00	770	2620.00	2,620
3" diameter buried gas piping	140	LF	9.80	1,372	12.50	1,750	22.30	3,122
3" building connection and sleeve	1	EA	85.00	85	115.00	115	200.00	200

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1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
01 - SITE WORK	*QUANTITY*	*UNIT*	*RATE*	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
Site Mechanical			*$*	*$*	*$*	*$*	*$*	*$*
NATURAL GAS (Continued)								
3" service line connection including fee	1	LOT	1500.00	1,500	700.00	700	2200.00	2,200
Test system	1	LOT	100.00	100	400.00	400	500.00	500
SUBTOTAL:				*$ 52,449*		*$ 36,993*		*$ 89,442*
Labor Premium Time	16.70%					6,178		6,178
SUBTOTAL:				*$ 52,449*		*$ 43,171*		*$ 95,620*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			10,490		8,634		19,124
TOTAL ESTIMATED COST:				***$ 62,939***		***$ 51,805***		***$ 114,744***

HMS Project No.: 15058

1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
01 - SITE WORK	*QUANTITY*	*UNIT*	*RATE*	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
Site Electrical			*$*	*$*	*$*	*$*	*$*	*$*
POWER								
4" RGS pole drops and verticals at building (2)	90	LF	25.80	2,322	33.40	3,006	59.20	5,328
4" diameter PVC buried conduit (2)	140	LF	9.70	1,358	15.05	2,107	24.75	3,465
500 KCMIL conductors (4)	920	LF	9.45	8,694	4.20	3,864	13.65	12,558
Pole surge arrestors and connections to existing overhead service	8	EA	65.00	520	120.00	960	185.00	1,480
__ KVA, pad mounted transformer	1	EA						By Utility Co.
5/8"x10'0" copper clad ground rods	2	EA	75.00	150	135.00	270	210.00	420
#3/0 bare copper ground wire	40	LF	2.75	110	2.10	84	4.85	194
Exothermic connections	8	EA	19.00	152	28.00	224	47.00	376
Thaw wire for water and sewer lines	240	LF	2.10	504	1.80	432	3.90	936
Power and connections to water well pump	1	LOT	350.00	350	570.00	570	920.00	920
Test and tag service	1	LOT	100.00	100	500.00	500	600.00	600
AREA LIGHTING								
Flashing warning post mounted light at fire truck exit	1	EA	3750.00	3,750	1250.00	1,250	5000.00	5,000

HMS Project No.: 15058

1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
01 - SITE WORK	*QUANTITY*	*UNIT*	*RATE*	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
Site Electrical			*$*	*$*	*$*	*$*	*$*	*$*
AREA LIGHTING (Continued)								
Automatic remote switch inside building	1	EA	250.00	250	170.00	170	420.00	420
25'0" poles and bases	7	EA	1570.00	10,990	850.00	5,950	2420.00	16,940
Pole mounted LED fixtures	10	EA	1270.00	12,700	380.00	3,800	1650.00	16,500
1" diameter PVC buried conduit including trenching	1,135	LF	4.30	4,881	7.50	8,513	11.80	13,394
#10 wiring (3)	4,365	LF	0.24	1,048	0.65	2,837	0.89	3,885
Panel and fixture connections	22	EA	8.50	187	17.50	385	26.00	572
Test and tag	1	LOT	150.00	150	750.00	750	900.00	900
HEADBOLT PLUG-INS								
Building mounted bull rail	210	LF	6.50	1,365	4.40	924	10.90	2,289
Headbolt duplex receptacles including conduit and wiring	10	EA	195.00	1,950	270.00	2,700	465.00	4,650
225 amp, 24 circuit headbolt panel inside building	1	LOT	1850.00	1,850	1120.00	1,120	2970.00	2,970
Test and tag	1	LOT	50.00	50	250.00	250	300.00	300

HMS Project No.: 15058

1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
01 - SITE WORK	*QUANTITY*	*UNIT*	*RATE*	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
Site Electrical			*$*	*$*	*$*	*$*	*$*	*$*
DATA/COMMUNICATIONS								
2" RGS pole drop and vertical at building	50	LF	9.65	483	14.10	705	23.75	1,188
2" diameter PVC buried conduit	140	LF	4.75	665	7.40	1,036	12.15	1,701
Data/communications cables (4)	760	LF						By Utility Co.
Test and tag	1	LOT	50.00	50	200.00	200	250.00	250
SUBTOTAL:				*$ 54,629*		*$ 42,607*		*$ 97,236*
Labor Premium Time	16.70%					7,115		7,115
SUBTOTAL:				*$ 54,629*		*$ 49,722*		*$ 104,351*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			10,926		9,944		20,870
TOTAL ESTIMATED COST:				***$ 65,555***		***$ 59,666***		***$ 125,221***

HMS Project No.: 15058

1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
02 - SUBSTRUCTURE	*QUANTITY*	*UNIT*	*RATE* *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
FOUNDATIONS								
Excavate and backfill	880	CY	3.50	3,080	12.50	11,000	16.00	14,080
24"x12" bar reinforced concrete footings including forms (74 CY)	950	LF	20.50	19,475	23.75	22,563	44.25	42,038
5'0"x5'0"x2'0" bar reinforced concrete bases at apparatus bays (43 CY)	22	EA	530.00	11,660	650.00	14,300	1180.00	25,960
4'0"x4'0"x1'0" bar reinforced concrete bases at admin areas (30 CY)	48	EA	325.00	15,600	395.00	18,960	720.00	34,560
8" thick bar reinforced concrete foundation walls (79 CY)	3,012	SF	11.50	34,638	13.20	39,758	24.70	74,396
24"x24"x36" bar reinforced concrete pilasters (10 CY)	22	EA	370.00	8,140	425.00	9,350	795.00	17,490
Dampproofing to foundation	4,275	SF	1.70	7,268	2.55	10,901	4.25	18,169
2" rigid insulation	3,012	SF	0.90	2,711	0.50	1,506	1.40	4,217
12" girth insulation metal flashings	950	LF	2.75	2,613	1.90	1,805	4.65	4,418
1"x15" embedded anchor bolts for bases	88	EA	12.50	1,100	27.00	2,376	39.50	3,476
1"x10" embedded anchor bolts for bases	192	EA	7.20	1,382	15.00	2,880	22.20	4,262
5/8"x6" embedded bolts, 32" o/c	356	EA	3.15	1,121	7.50	2,670	10.65	3,791

HMS Project No.: 15058

1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
02 - SUBSTRUCTURE	*QUANTITY*	*UNIT*	*RATE* *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
FOUNDATIONS (Continued)								
1 1/2" non-shrink grout at base plates	82	SF	15.00	1,230	18.00	1,476	33.00	2,706
SLAB ON GRADE								
6" thick crushed aggregate under slab	822	CY	19.00	15,618	8.00	6,576	27.00	22,194
8 mil vapor retarder	37,000	SF	0.07	2,590	0.10	3,700	0.17	6,290
6" bar reinforced concrete slab at apparatus bays (117 CY)	6,000	SF	4.55	27,300	3.75	22,500	8.30	49,800
4" bar reinforced concrete slab elsewhere (398 CY)	31,000	SF	4.10	127,100	3.55	110,050	7.65	237,150
Extra for thickened slabs	780	LF	1.80	1,404	2.50	1,950	4.30	3,354
Extra for forming 6" thick trench drains at apparatus bays (3)	90	LF	5.20	468	11.50	1,035	16.70	1,503
2" thick x 12" bar grate and frame	90	LF	32.00	2,880	10.00	900	42.00	3,780
4" thick bar reinforced concrete housekeeping pads (4)	480	SF	4.20	2,016	3.70	1,776	7.90	3,792
SUBTOTAL:				*$ 289,394*		*$ 288,032*		*$ 577,426*
Labor Premium Time	16.70%					48,101		48,101
TOTAL ESTIMATED COST:				***$ 289,394***		***$ 336,133***		***$ 625,527***

HMS Project No.: 15058

1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
03 - SUPERSTRUCTURE	*QUANTITY*	*UNIT*	*RATE* *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
MEZZANINE								
Equipment platform and structure	1,500	SF	13.50	20,250	10.30	15,450	23.80	35,700
24"x10'0" ships ladder	1	EA	875.00	875	480.00	480	1355.00	1,355
ROOF CONSTRUCTION								
Canopies								
Light gauge cantilevered steel framing and connections	2,200	LBS	1.15	2,530	1.10	2,420	2.25	4,950
1 1/2" steel decking	250	SF						Not Required
Main Roof Construction								
16"x18"x1" thick base plates	22	EA	95.75	2,107	110.00	2,420	205.75	4,527
12"x12"x3/4" thick base plates	48	EA	57.00	2,736	65.00	3,120	122.00	5,856
20'0"x100'0"x20'0" pre-engineered steel portal frame (6 each, 55#/LF)	46,200	LBS	1.10	50,820	1.05	48,510	2.15	99,330
12'0"x100'0"x12'0" pre-engineered steel portal frame (12 each, 45#/LF)	66,960	LBS	1.10	73,656	1.05	70,308	2.15	143,964
W14x45# end columns (10)	10,800	LBS	1.15	12,420	1.10	11,880	2.25	24,300
W12x35# end columns (10)	10,080	LBS	1.15	11,592	1.10	11,088	2.25	22,680

HMS Project No.: 15058

1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
03 - SUPERSTRUCTURE	*QUANTITY*	*UNIT*	*RATE* *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
ROOF CONSTRUCTION (Continued)								
Main Roof Construction (Continued)								
Tube steel cross bracing (6)	5,300	LBS	1.25	6,625	1.15	6,095	2.40	12,720
1 1/2"x1 1/2"x1/8" roof bridging	5,750	LBS	1.15	6,613	1.15	6,613	2.30	13,226
Miscellaneous angles, plates, connections, etc. (12.50%)	18,160	LBS	1.25	22,700	1.35	24,516	2.60	47,216
Moment frame connections	40	EA	195.00	7,800	250.00	10,000	445.00	17,800
1 1/2" deep steel decking	37,582	SF						Not Required
GIRTS AND PURLINS								
8" Z wall girts, 36" o/c	6,533	LF	3.80	24,825	2.90	18,946	6.70	43,771
8" Z roof purlins, 30" o/c	14,800	LF	3.80	56,240	3.15	46,620	6.95	102,860
MISCELLANEOUS								
50 ton crane and operator	5	WKS	7500.00	37,500	1250.00	6,250	8750.00	43,750
Special inspections	1	LOT	7000.00	7,000			7000.00	7,000
Temporary shoring	37,582	SF	0.15	5,637	0.25	9,396	0.40	15,033
SUBTOTAL:				*$ 351,926*		*$ 294,112*		*$ 646,038*

HMS Project No.: 15058

1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
03 - SUPERSTRUCTURE	*QUANTITY*	*UNIT*	*RATE* $	*TOTAL* $	*RATE* $	*TOTAL* $	*UNIT RATE* $	*MATERIAL/LABOR* $
Labor Premium Time	16.70%					49,117		49,117
TOTAL ESTIMATED COST:				***$ 351,926***		***$ 343,229***		***$ 695,155***

HMS Project No.: 15058

1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
04 - EXTERIOR CLOSURE	*QUANTITY*	*UNIT*	*RATE* *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
WALLS								
4" thick x 24" wide prefinished insulated metal wall panels	15,864	SF	13.50	214,164	5.20	82,493	18.70	296,657
Extra for vertical panel reveals	480	LF	1.00	480	1.50	720	2.50	1,200
6" base flashings	830	LF	2.70	2,241	1.85	1,536	4.55	3,777
Door flashings	424	LF	1.85	784	1.70	721	3.55	1,505
Caulk and seal doors, each side	848	LF	0.70	594	1.55	1,314	2.25	1,908
Caulk and seal siding, one side	9,560	LF	0.35	3,346	0.80	7,648	1.15	10,994
Mechanical openings metal louvers	240	SF	28.50	6,840	10.20	2,448	38.70	9,288
4"x36" high truck bay painted door numbers	6	EA	48.00	288	85.00	510	133.00	798
5"x48" fire station name	1	LOT	110.00	110	185.00	185	295.00	295
DOORS								
3'0"x7'0" insulated hollow metal single door assemblies	4	EA	875.00	3,500	380.00	1,520	1255.00	5,020
3'0"x7'0" insulated hollow metal double door assemblies with vision lights	4	PRS	2170.00	8,680	750.00	3,000	2920.00	11,680

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1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
04 - EXTERIOR CLOSURE	*QUANTITY*	*UNIT*	*RATE* *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
DOORS (Continued)								
14'0"x16'0"x2" thick high speed Thermacore overhead doors with (5) 24"x18" vision lights, gears and power operators	6	EA	7785.00	46,710	1925.00	11,550	9710.00	58,260
10'0"x12'0" vehicle storage overhead doors	2	EA	4050.00	8,100	1150.00	2,300	5200.00	10,400
WINDOWS								
Low E insulated glazed PVC framed windows	1,710	SF	57.50	98,325	14.00	23,940	71.50	122,265
Extra for operable panes with bug screens (25%)	488	SF	4.25	2,074	2.50	1,220	6.75	3,294
Window flashings	1,120	LF	1.85	2,072	1.70	1,904	3.55	3,976
Caulk and seal windows, each side	2,240	LF	0.70	1,568	1.55	3,472	2.25	5,040
Paint man doors and frames	504	SF	0.30	151	1.70	857	2.00	1,008
SUBTOTAL:				*$ 400,027*		*$ 147,338*		*$ 547,365*
Labor Premium Time	16.70%					24,605		24,605
TOTAL ESTIMATED COST:				***$ 400,027***		***$ 171,943***		***$ 571,970***

HMS Project No.: 15058

1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
05 - ROOF SYSTEMS	*QUANTITY*	*UNIT*	*RATE* *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
CANOPIES								
Metal roofing and flashings fixed to structure	250	SF	6.20	1,550	4.55	1,138	10.75	2,688
MAIN ROOF								
5" thick prefinished insulated metal panels fixed to purlins	37,582	SF	14.25	535,544	5.70	214,217	19.95	749,761
Caulking and sealants at panel joints	4,056	LF	0.60	2,434	1.20	4,867	1.80	7,301
Roof edge flashings	475	LF	2.70	1,283	2.50	1,188	5.20	2,471
Ridge and valley flashings	535	LF	3.90	2,087	3.25	1,739	7.15	3,826
Mechanical penetration flashings	1	LOT	250.00	250	450.00	450	700.00	700
Temporary fall protection railings	950	LF	3.80	3,610	2.70	2,565	6.50	6,175
SUBTOTAL:				*$ 546,758*		*$ 226,164*		*$ 772,922*
Labor Premium Time	16.70%					37,769		37,769
TOTAL ESTIMATED COST:				***$ 546,758***		***$ 263,933***		***$ 810,691***

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1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
06 - INTERIOR CONSTRUCTION	*QUANTITY*	*UNIT*	*RATE* *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
Note: All are based on net assignable area (NAA).								
PARTITIONS AND DOORS								
Partitions and doors in fire station and offices	7,924	SF	6.50	51,506	4.25	33,677	10.75	85,183
Partitions and doors in dorm rooms	285	SF	5.70	1,625	3.50	998	9.20	2,623
Partitions and doors in training and admin area	9,365	SF	6.00	56,190	4.00	37,460	10.00	93,650
Partitions and doors in warehouse/support areas	9,140	SF	3.20	29,248	2.50	22,850	5.70	52,098
Partitions and doors in lobby and arctic entries	1,410	SF	5.30	7,473	4.70	6,627	10.00	14,100
Partitions and doors in building services	3,970	SF	3.70	14,689	2.80	11,116	6.50	25,805
FINISHES								
Finishes in fire station	7,924	SF	4.30	34,073	3.80	30,111	8.10	64,184
Finishes in dorms	2,851	SF	5.40	15,395	4.15	11,832	9.55	27,227
Finishes in training/admin	9,365	SF	5.80	54,317	4.50	42,143	10.30	96,460
Finishes in warehouse/support areas	9,140	SF	3.00	27,420	2.50	22,850	5.50	50,270
Finishes in lobby/arctic entries	1,410	SF	7.75	10,928	9.50	13,395	17.25	24,323
Finishes in building services	3,970	SF	3.00	11,910	2.50	9,925	5.50	21,835

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1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
06 - INTERIOR CONSTRUCTION	*QUANTITY*	*UNIT*	*RATE* $	*TOTAL* $	*RATE* $	*TOTAL* $	*UNIT RATE* $	*MATERIAL/LABOR* $
SPECIALTIES								
Miscellaneous specialties, signage, lockers, casework, etc. at fire station	7,924	SF	2.50	19,810	3.20	25,357	5.70	45,167
Miscellaneous specialties, signage, lockers, casework, etc. at dorms	2,851	SF	2.15	6,130	2.50	7,128	4.65	13,258
Miscellaneous specialties, signage, lockers, casework, etc. at training/admin	9,365	SF	3.20	29,968	3.70	34,651	6.90	64,619
Miscellaneous specialties, signage, lockers, casework, etc. at warehouse/support areas	9,140	SF	2.20	20,108	3.00	27,420	5.20	47,528
Miscellaneous specialties, signage, lockers, casework, etc. at lobby/arctic entries	1,410	SF	3.00	4,230	3.50	4,935	6.50	9,165
Miscellaneous specialties, signage, lockers, casework, etc. at building services	3,970	SF	2.20	8,734	3.00	11,910	5.20	20,644
SUBTOTAL:				*$ 403,754*		*$ 354,385*		*$ 758,139*
Labor Premium Time	16.70%					59,182		59,182
TOTAL ESTIMATED COST:				***$ 403,754***		***$ 413,567***		***$ 817,321***

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1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
08 - MECHANICAL	*QUANTITY*	*UNIT*	*RATE* *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
PLUMBING								
25 GPM, 53 gallon oil/water separator and valves	1	LOT	2200.00	2,200	850.00	850	3050.00	3,050
__ gallon pressurized well water tank and piping	1	LOT	1850.00	1,850	730.00	730	2580.00	2,580
Small water treatment system	1	LOT	1500.00	1,500	600.00	600	2100.00	2,100
Plumbing fixtures, equipment and piping	34,660	SF	3.15	109,179	4.50	155,970	7.65	265,149
HEATING								
Gas fired boilers, pumps, valves and piping	2	LOTS	27500.00	55,000	12500.00	25,000	40000.00	80,000
Air separator, glycol tank and piping	1	LOT	3300.00	3,300	1200.00	1,200	4500.00	4,500
Boiler manifolds and valves	2	LOTS	1450.00	2,900	1875.00	3,750	3325.00	6,650
10" to 12" flue, breeching and caps	2	LOTS	1625.00	3,250	850.00	1,700	2475.00	4,950
Cabinet unit heaters, unit heaters, baseboard and piping	34,660	SF	2.85	98,781	3.70	128,242	6.55	227,023
VENTILATION								
25,000 CFM air handling units	2	EA	75000.00	150,000	20000.00	40,000	95000.00	190,000
15,000 CFM building relief air fan	1	EA	17500.00	17,500	6700.00	6,700	24200.00	24,200

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1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
08 - MECHANICAL	*QUANTITY*	*UNIT*	*RATE* *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
VENTILATION (Continued)								
1,500 CFM ventilation fan	1	EA	2800.00	2,800	1300.00	1,300	4100.00	4,100
1,000 CFM to 500 CFM miscellaneous fans	4	EA	1650.00	6,600	870.00	3,480	2520.00	10,080
Louvers, dampers, etc.	1	LOT	3000.00	3,000	1200.00	1,200	4200.00	4,200
Ductwork, grilles, diffusers, insulation, etc.	34,660	SF	3.50	121,310	4.20	145,572	7.70	266,882
Direct digital controls system	34,660	SF	2.75	95,315	3.50	121,310	6.25	216,625
Test and balance system	110	HRS			150.00	16,500	150.00	16,500
FIRE PROTECTION								
4" buried water main	100	LF	18.50	1,850	32.00	3,200	50.50	5,050
4" connections to existing including gate valve	1	EA	775.00	775	450.00	450	1225.00	1,225
300 GPM, __ HP fire pump and piping	1	EA	18500.00	18,500	4200.00	4,200	22700.00	22,700
__ GPM jockey pump and piping	1	EA	2200.00	2,200	835.00	835	3035.00	3,035
Pump controller panel	1	EA	1450.00	1,450	775.00	775	2225.00	2,225
Sprinkler riser and valves	1	LOT	2250.00	2,250	2775.00	2,775	5025.00	5,025
Preaction system at apparatus bays	6,000	SF	1.80	10,800	2.15	12,900	3.95	23,700

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1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
08 - MECHANICAL	*QUANTITY*	*UNIT*	*RATE* *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
FIRE PROTECTION (Continued)								
Wet pipe system at remaining areas	28,660	SF	1.55	44,423	1.90	54,454	3.45	98,877
Testing and design fee	1	LOT	5500.00	5,500	750.00	750	6250.00	6,250
MISCELLANEOUS								
Natural gas piping and connections to hot water heater and boilers	3	LOTS	1125.00	3,375	1575.00	4,725	2700.00	8,100
Testing	1	LOT	200.00	200	500.00	500	700.00	700
Equipment operations training	36	HRS			150.00	5,400	150.00	5,400
SUBTOTAL:				*$ 765,808*		*$ 745,068*		*$ 1,510,876*
Labor Premium Time	16.70%					124,426		124,426
SUBTOTAL:				*$ 765,808*		*$ 869,494*		*$ 1,635,302*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			153,162		173,899		327,061
TOTAL ESTIMATED COST:				***$ 918,970***		***$ 1,043,393***		***$ 1,962,363***

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1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
09 - ELECTRICAL	*QUANTITY*	*UNIT*	*RATE* *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
SERVICE AND DISTRIBUTION								
800 amp CT and meter base	1	LOT	2850.00	2,850	1230.00	1,230	4080.00	4,080
800 amp disconnect switch	1	EA	985.00	985	350.00	350	1335.00	1,335
800 amp, 8 circuit main distribution panel	1	EA	6750.00	6,750	3350.00	3,350	10100.00	10,100
225 amp, 42 circuit subpanels	3	EA	2250.00	6,750	1225.00	3,675	3475.00	10,425
225 amp, 30 circuit subpanels	2	EA	1975.00	3,950	1050.00	2,100	3025.00	6,050
Equipment grounding and surge protection devices	1	LOT	500.00	500	750.00	750	1250.00	1,250
Feeders and conductors	1	LOT	2500.00	2,500	4500.00	4,500	7000.00	7,000
LIGHTING AND POWER								
Lighting fixtures, occupancy sensors, switches, receptacles, etc. to fire station	6,000	SF	5.20	31,200	4.50	27,000	9.70	58,200
Lighting fixtures, occupancy sensors, switches, receptacles, etc. to support areas	1,924	SF	3.70	7,119	3.15	6,061	6.85	13,180
Lighting fixtures, occupancy sensors, switches, receptacles, etc. to dorms	2,851	SF	3.90	11,119	4.00	11,404	7.90	22,523
Lighting fixtures, occupancy sensors, switches, receptacles, etc. to training/admin	9,365	SF	4.80	44,952	4.30	40,270	9.10	85,222

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1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
09 - ELECTRICAL	*QUANTITY*	*UNIT*	*RATE* *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
LIGHTING AND POWER (Continued)								
Lighting fixtures, occupancy sensors, switches, receptacles, etc. to warehouse, etc.	9,140	SF	3.70	33,818	3.15	28,791	6.85	62,609
Lighting fixtures, occupancy sensors, switches, receptacles, etc. to lobby	1,410	SF	7.00	9,870	5.00	7,050	12.00	16,920
Lighting fixtures, occupancy sensors, switches, receptacles, etc. to building services	3,970	SF	3.70	14,689	3.15	12,506	6.85	27,195
Exterior building mounted LED fixtures	14	EA	540.00	7,560	185.00	2,590	725.00	10,150
Conduit and wiring to lighting and power	34,660	LF	2.40	83,184	2.85	98,781	5.25	181,965
SPECIAL SYSTEMS								
125 KW diesel engine emergency power, complete system	1	LOT	37500.00	37,500	6700.00	6,700	44200.00	44,200
Complete fire alarm system	34,660	SF	1.80	62,388	2.15	74,519	3.95	136,907
CO/NO_2 detection system	1	LOT	2500.00	2,500	3200.00	3,200	5700.00	5,700
Telecommunications system	34,660	SF	1.50	51,990	1.90	65,854	3.40	117,844
Radio dispatch system for fire station	1	LOT	5500.00	5,500	7500.00	7,500	13000.00	13,000

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1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
09 - ELECTRICAL	*QUANTITY*	*UNIT*	*RATE* *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
MISCELLANEOUS								
Test and tag all electrical systems	1	LOT	500.00	500	2200.00	2,200	2700.00	2,700
SUBTOTAL:				*$ 428,174*		*$ 410,381*		*$ 838,555*
Labor Premium Time	16.70%					68,534		68,534
SUBTOTAL:				*$ 428,174*		*$ 478,915*		*$ 907,089*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			85,635		95,783		181,418
TOTAL ESTIMATED COST:				***$ 513,809***		***$ 574,698***		***$ 1,088,507***

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1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
10 - EQUIPMENT AND FURNISHINGS	*QUANTITY*	*UNIT*	*RATE* *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
Fire station decontamination station, oxygen bolted, scuba diving equipment, etc.	1	LOT	18500.00	18,500	6500.00	6,500	25000.00	25,000
Miscellaneous break room appliances	1	LOT	3500.00	3,500	500.00	500	4000.00	4,000
Dorm kitchen equipment, refrigerators, dishwasher, etc.	240	SF	125.00	30,000	55.00	13,200	180.00	43,200
Laundry washers and dryers	4	EA	1350.00	5,400	300.00	1,200	1650.00	6,600
Fitness center equipment	1	LOT	11500.00	11,500	1500.00	1,500	13000.00	13,000
AV equipment	1	LOT	5500.00	5,500	1500.00	1,500	7000.00	7,000
Exterior window blinds	1,806	SF	9.00	16,254	1.20	2,167	10.20	18,421
Dorm shades/blinds (12)	144	SF	13.50	1,944	1.70	245	15.20	2,189
Beds, nightstands, linens, etc. at dorms	12	RMS						With FFE Budget
Admin, training classrooms, etc. loose furniture and furnishings	1	LOT						With FFE Budget
SUBTOTAL:				*$ 92,598*		*$ 26,812*		*$ 119,410*
Labor Premium Time	16.70%					4,478		4,478
TOTAL ESTIMATED COST:				***$ 92,598***		***$ 31,290***		***$ 123,888***

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1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
12 - GENERAL REQUIREMENTS	*QUANTITY*	*UNIT*	*RATE* *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
Mobilization/demobilization	1	LOT	2000.00	2,000	5000.00	5,000	7000.00	7,000
Miscellaneous freight (rest with unit rates)	30	TONS	375.00	11,250	75.00	2,250	450.00	13,500
Miscellaneous air freight	1,500	LBS	1.25	1,875	0.25	375	1.50	2,250
Operation costs for personnel	12	MOS	700.00	8,400	15500.00	186,000	16200.00	194,400
Operation costs for construction equipment	12	MOS	3300.00	39,600	500.00	6,000	3800.00	45,600
Miscellaneous construction aids, dumpsters, porta cans, etc.	12	MOS	1850.00	22,200	1050.00	12,600	2900.00	34,800
Alaska Dept. of Labor fee	1	LOT	5000.00	5,000			5000.00	5,000
SUBTOTAL:				*$ 90,325*		*$ 212,225*		*$ 302,550*
Home Office	3.00%							249,338
Overhead and Profit	8.50%							727,651
Bonds	0.85%							78,950
Insurances	1.15%							107,723

TOTAL ESTIMATED COST: ***$ 1,466,212***

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1. FIRE STATION/ADMIN/TRAINING CENTER BUILDING (1)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
13 - CONTINGENCIES	*QUANTITY*	*UNIT*	*RATE*	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
ESTIMATOR'S CONTINGENCY								
The estimator's allowance for architectural and engineering requirements that are not apparent at an early level of design documentation	12.00%							$ 1,136,991
ESCALATION CONTINGENCY								
The allowance for escalation from the date of estimate to 2018 construction at 2.75% per annum (25 months)	5.73%							$ 608,063

TOTAL ESTIMATED COST: ***$ 1,745,054***

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2. TRAILS, ACCESS, DRAFTING POND, FENCING, REPURPOSE EXISTING BUILDING, ETC.

CONCEPT DESIGN COST SUMMARY (REVISION 2)

		Material	*Labor*	*Total*
01 - SITE WORK				
Site Preparation and Improvements		$ 124,860	$ 144,461	$ 269,321
Site Mechanical		7,170	14,214	21,384
Site Electrical		2,610	5,251	7,861
02 - SUBSTRUCTURE		0	0	0
03 - SUPERSTRUCTURE		0	0	0
04 - EXTERIOR CLOSURE		0	0	0
05 - ROOF SYSTEMS		0	0	0
06 - INTERIOR CONSTRUCTION		0	0	0
07 - CONVEYING SYSTEMS		0	0	0
08 - MECHANICAL		0	0	0
09 - ELECTRICAL		0	0	0
10 - EQUIPMENT		0	0	0
11 - SPECIAL CONSTRUCTION		23,940	41,662	65,602
SUBTOTAL DIRECT WORK:		*$ 158,580*	*$ 205,588*	*$ 364,168*
12 - GENERAL REQUIREMENTS, OVERHEAD AND PROFIT	20.00%			72,834
SUBTOTAL:				*$ 437,002*
13 - CONTINGENCIES AND ESCALATION	15.00%			65,550
TOTAL ESTIMATED CONSTRUCTION COST:				***$ 502,552***

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2. TRAILS, ACCESS, DRAFTING POND, FENCING, REPURPOSE EXISTING BLDG., ETC. ***01 - SITE WORK*** ***Site Preparation and Improvements***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
PREPARATION								
Site survey and staking	1.44	AC	750.00	1,080	6000.00	8,640	6750.00	9,720
Erosion and pollution control at trails, etc.	29,640	SF	0.03	889	0.07	2,075	0.10	2,964
Silt fencing, etc. to protect wetlands	1	LOT	2500.00	2,500	3500.00	3,500	6000.00	6,000
EARTHWORK								
Cut trees and grub up roots at ditches, drafting pond, training area, trails, etc.	1.44	AC			6000.00	8,640	6000.00	8,640
Excavate and dispose on site, average 12" deep for trails	1,100	CY			4.70	5,170	4.70	5,170
Excavate and dispose on site, average 48" deep for pond	2,000	CY			5.70	11,400	5.70	11,400
Excavate and dispose on site, average 18" deep for training access area	661	CY			5.20	3,437	5.20	3,437
NFS fill at trails and training access, compacted (average 6" to 12" deep)	1,188	CY	14.50	17,226	7.00	8,316	21.50	25,542
Soil compaction tests (1 per 508 CY)	4	EA	225.00	900			225.00	900

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2. TRAILS, ACCESS, DRAFTING POND, FENCING, REPURPOSE EXISTING BLDG., ETC. ***01 - SITE WORK*** ***Site Preparation and Improvements***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
IMPROVEMENTS								
Trails								
4" D1, compacted	453	CY	19.00	8,607	8.00	3,624	27.00	12,231
Finish grade	29,640	SF			0.15	4,446	0.15	4,446
Trail signs, posts and bases	8	EA	150.00	1,200	135.00	1,080	285.00	2,280
Training Access								
4" D1, compacted	182	CY	19.00	3,458	8.00	1,456	27.00	4,914
Finish grade	11,898	SF			0.15	1,785	0.15	1,785
3" AC pavement (208 tons)	11,898	SF	1.55	18,442	1.15	13,683	2.70	32,125
Match West Road	60	LF	2.70	162	3.50	210	6.20	372
Pavement markings	1	LOT	300.00	300	500.00	500	800.00	800
Directional signs, posts and bases	3	EA	150.00	450	135.00	405	285.00	855
Drafting Pond								
45 mil HDPE liner to bottom and sides	1,846	SY	3.80	7,015	1.70	3,138	5.50	10,153
Perimeter anchorage to liner	480	LF	4.15	1,992	2.50	1,200	6.65	3,192

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2. TRAILS, ACCESS, DRAFTING POND, FENCING, REPURPOSE EXISTING BLDG., ETC. ***01 - SITE WORK*** ***Site Preparation and Improvements***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
IMPROVEMENTS (Continued)								
Drafting Pond (Continued)								
Note: Pond to be filled by fire department.								
Ditches								
Form drainage ditches in existing ground (16,060 LF)	1,347	CY	3.30	4,445	5.50	7,409	8.80	11,854
Fencing								
8'0" barbed wire fencing, rails, posts and concrete bases	865	LF	39.75	34,384	14.50	12,543	54.25	46,927
Tie new fencing into existing	2	EA	30.00	60	55.00	110	85.00	170
4'0"x8'0" man gate, posts and bases	1	EA	870.00	870	350.00	350	1220.00	1,220
Access sign, fence mounted	1	EA	70.00	70	40.00	40	110.00	110
SUBTOTAL:				*$ 104,050*		*$ 103,157*		*$ 207,207*
Labor Premium Time	16.70%					17,227		17,227
SUBTOTAL:				*$ 104,050*		*$ 120,384*		*$ 224,434*

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2. TRAILS, ACCESS, DRAFTING POND, FENCING, REPURPOSE EXISTING BLDG., ETC. ***01 - SITE WORK*** ***Site Preparation and Improvements***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			20,810		24,077		44,887
TOTAL ESTIMATED COST:				***$ 124,860***		***$ 144,461***		***$ 269,321***

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2. TRAILS, ACCESS, DRAFTING POND, FENCING, REPURPOSE EXISTING BLDG., ETC. ***01 - SITE WORK*** ***Site Mechanical***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
2" gas service and trenching from Admiralty Circle to site	500	LF	11.75	5,875	19.50	9,750	31.25	15,625
Testing	1	LOT	100.00	100	400.00	400	500.00	500
SUBTOTAL:				*$ 5,975*		*$ 10,150*		*$ 16,125*
Labor Premium Time	16.70%					1,695		1,695
SUBTOTAL:				*$ 5,975*		*$ 11,845*		*$ 17,820*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			1,195		2,369		3,564
TOTAL ESTIMATED COST:				***$ 7,170***		***$ 14,214***		***$ 21,384***

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2. TRAILS, ACCESS, DRAFTING POND, FENCING, REPURPOSE EXISTING BLDG., ETC. ***01 - SITE WORK*** ***Site Electrical***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
Extend (3) phase buried service from cruiser to north side of site	200	LF	10.50	2,100	17.00	3,400	27.50	5,500
Testing	1	LOT	75.00	75	350.00	350	425.00	425
SUBTOTAL:				*$ 2,175*		*$ 3,750*		*$ 5,925*
Labor Premium Time	16.70%					626		626
SUBTOTAL:				*$ 2,175*		*$ 4,376*		*$ 6,551*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			435		875		1,310
TOTAL ESTIMATED COST:				***$ 2,610***		***$ 5,251***		***$ 7,861***

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2. TRAILS, ACCESS, DRAFTING POND, FENCING, REPURPOSE EXISTING BLDG., ETC. ***11 - SPECIAL CONSTRUCTION*** ***Buildings and Structures***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
REPURPOSE EXISTING TRAINING CENTER (1)								
Renovate existing building to house training apparatus, snow removal, and other miscellaneous equipment	4,200	SF	5.70	23,940	8.50	35,700	14.20	59,640
SUBTOTAL:				*$ 23,940*		*$ 35,700*		*$ 59,640*
Labor Premium Time	16.70%					5,962		5,962
TOTAL ESTIMATED COST:				***$ 23,940***		***$ 41,662***		***$ 65,602***

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3. TRAINING TOWER SHOP, INVESTIGATOR BUILDING, ETC.

CONCEPT DESIGN COST SUMMARY (REVISION 2)

		Material	*Labor*	*Total*
01 - SITE WORK				
Site Preparation and Improvements		$ 255,192	$ 260,082	$ 515,274
Site Mechanical		4,567	5,342	9,909
Site Electrical		34,697	32,042	66,739
02 - SUBSTRUCTURE		0	0	0
03 - SUPERSTRUCTURE		0	0	0
04 - EXTERIOR CLOSURE		0	0	0
05 - ROOF SYSTEMS		0	0	0
06 - INTERIOR CONSTRUCTION		0	0	0
07 - CONVEYING SYSTEMS		0	0	0
08 - MECHANICAL		0	0	0
09 - ELECTRICAL		0	0	0
10 - EQUIPMENT		0	0	0
11 - SPECIAL CONSTRUCTION		169,442	293,902	463,344
SUBTOTAL DIRECT WORK:		*$ 463,898*	*$ 591,368*	*$ 1,055,266*
12 - GENERAL REQUIREMENTS, OVERHEAD AND PROFIT	24.00%			253,264
SUBTOTAL:				*$ 1,308,530*
13 - CONTINGENCIES AND ESCALATION	15.00%			196,280
TOTAL ESTIMATED CONSTRUCTION COST:				***$ 1,504,810***

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3. TOWER/SHOP/INVESTIGATOR BLDG., ETC. ***01 - SITE WORK*** ***Site Preparation and Improvements***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
PREPARATION								
Site survey and staking	1.70	AC	750.00	1,275	6000.00	10,200	6750.00	11,475
Erosion and pollution control	64,080	SF	0.03	1,922	0.07	4,486	0.10	6,408
EARTHWORK								
Cut trees and grub up roots	1.70	AC			6000.00	10,200	6000.00	10,200
Excavate and dispose organics on site, average 24" deep	5,496	CY			5.20	28,579	5.20	28,579
Average 18" deep NFS fill, compacted	4,947	CY	14.50	71,732	7.50	37,103	22.00	108,835
Soil compaction tests (1 per 500 CY)	10	EA	225.00	2,250			225.00	2,250
IMPROVEMENTS								
AC Pavements								
4" D1 leveling course, compacted	979	CY	19.00	18,601	8.00	7,832	27.00	26,433
3" AC pavements (1,122 tons)	64,080	SF	1.55	99,324	1.15	73,692	2.70	173,016
Match existing pavement	28	LF	2.70	76	3.50	98	6.20	174
Pavement marking allowance	1	LOT	350.00	350	650.00	650	1000.00	1,000
Signage allowance	1	LOT	800.00	800	500.00	500	1300.00	1,300

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3. TOWER/SHOP/INVESTIGATOR BLDG., ETC. ***01 - SITE WORK*** ***Site Preparation and Improvements***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
IMPROVEMENTS (Continued)								
AC Pavements (Continued)								
Landscaped island	1,800	SF	1.25	2,250	1.10	1,980	2.35	4,230
PAVILIONS AND GATHERING								
Outdoor areas with patio, benches, fire pits, etc.	1,600	SF	8.80	14,080	6.50	10,400	15.30	24,480
SUBTOTAL:				*$ 212,660*		*$ 185,720*		*$ 398,380*
Labor Premium Time	16.70%					31,015		31,015
SUBTOTAL:				*$ 212,660*		*$ 216,735*		*$ 429,395*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			42,532		43,347		85,879
TOTAL ESTIMATED COST:				***$ 255,192***		***$ 260,082***		***$ 515,274***

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3. TOWER/SHOP/INVESTIGATOR BLDG., ETC. ***01 - SITE WORK*** ***Site Mechanical***	*QUANTITY*	*UNIT*	*MATERIAL* *RATE* *$*	*MATERIAL* *TOTAL* *$*	*LABOR* *RATE* *$*	*LABOR* *TOTAL* *$*	*TOTAL UNIT RATE* *$*	*TOTAL MATERIAL/LABOR* *$*
WATER							Refer to Section 4 Loop Water Improvements	
SEWER								None
NATURAL GAS								
1" diameter gas line from fire station to tower	330	LF	3.70	1,221	5.50	1,815	9.20	3,036
Gas burners and valves at tower	1	LOT	485.00	485	350.00	350	835.00	835
Propane gas system for training tower	1	LOT	1800.00	1,800	750.00	750	2550.00	2,550
MISCELLANEOUS								
Test all systems	2	LOTS	150.00	300	450.00	900	600.00	1,200
SUBTOTAL:				*$ 3,806*		*$ 3,815*		*$ 7,621*
Labor Premium Time	16.70%					637		637
SUBTOTAL:				*$ 3,806*		*$ 4,452*		*$ 8,258*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			761		890		1,651
TOTAL ESTIMATED COST:				***$ 4,567***		***$ 5,342***		***$ 9,909***

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3. TOWER/SHOP/INVESTIGATOR BLDG., ETC. ***01 - SITE WORK*** ***Site Electrical***	*QUANTITY*	*UNIT*	*MATERIAL* *RATE* *$*	*MATERIAL* *TOTAL* *$*	*LABOR* *RATE* *$*	*LABOR* *TOTAL* *$*	*TOTAL UNIT RATE* *$*	*TOTAL MATERIAL/LABOR* *$*
POWER								
1 1/2" diameter buried power from fire station parking to building	580	LF	7.70	4,466	12.50	7,250	20.20	11,716
Buildings meter base and disconnect switches	6	EA	835.00	5,010	550.00	3,300	1385.00	8,310
LIGHTING								
20'0" poles and bases	5	EA	1330.00	6,650	750.00	3,750	2080.00	10,400
LED fixtures	6	EA	1270.00	7,620	380.00	2,280	1650.00	9,900
1" diameter PVC buried conduits	560	LF	4.30	2,408	7.50	4,200	11.80	6,608
#10 wiring (3)	1,213	LF	0.24	291	0.65	788	0.89	1,079
Fixture connections	6	EA	8.50	51	17.50	105	26.00	156
DATA/COMMUNICATIONS								
1" diameter PVC buried empty conduit from fire station shop to investigator's office	510	LF	4.30	2,193	0.75	383	5.05	2,576
Note: Data/communications cabling by Utility Company.								
MISCELLANEOUS								
Test all systems	3	LOTS	75.00	225	275.00	825	350.00	1,050
SUBTOTAL:				*$ 28,914*		*$ 22,881*		*$ 51,795*

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3. TOWER/SHOP/INVESTIGATOR BLDG., ETC. ***01 - SITE WORK*** ***Site Electrical***	*QUANTITY*	*UNIT*	*MATERIAL* *RATE* *$*	*MATERIAL* *TOTAL* *$*	*LABOR* *RATE* *$*	*LABOR* *TOTAL* *$*	*TOTAL UNIT RATE* *$*	*TOTAL MATERIAL/LABOR* *$*
Labor Premium Time	16.70%					3,821		3,821
SUBTOTAL:				*$ 28,914*		*$ 26,702*		*$ 55,616*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			5,783		5,340		11,123
TOTAL ESTIMATED COST:				***$ 34,697***		***$ 32,042***		***$ 66,739***

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3. TOWER/SHOP/INVESTIGATOR BLDG., ETC. ***11 - SPECIAL CONSTRUCTION*** ***Buildings and Structures***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
TRAINING TOWER (1)								
Concrete foundations and slabs	2,400	SF	7.75	18,600	9.40	22,560	17.15	41,160
Dismantle existing three-story tower from Station 6, haul to new site for re-erection	4,800	SF	0.50	2,400	3.30	15,840	3.80	18,240
Reassemble and re-erect towers on new foundations	4,800	SF	1.10	5,280	12.50	60,000	13.60	65,280
Additional materials not salvageable during relocation (assume 25%)	1,200	SF	5.50	6,600	12.50	15,000	18.00	21,600
Add new portals for ducting smoke	1	LOT	4000.00	4,000	2500.00	2,500	6500.00	6,500
Salamander heaters	1	LOT	850.00	850	200.00	200	1050.00	1,050
REHABILITATE PAVILION (1)								
Concrete foundations and slab on grade	960	SF	7.75	7,440	9.40	9,024	17.15	16,464
Roof structure	960	SF	11.00	10,560	14.00	13,440	25.00	24,000
36" exterior closure at base (rest open to sides)	384	SF	13.00	4,992	8.00	3,072	21.00	8,064
Cold metal roofing	960	SF	5.40	5,184	3.50	3,360	8.90	8,544
Interior construction (minimal)	960	SF	2.20	2,112	3.00	2,880	5.20	4,992

Note: No utilities.

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3. TOWER/SHOP/INVESTIGATOR BLDG., ETC. ***11 - SPECIAL CONSTRUCTION*** ***Buildings and Structures***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
FIRE INVESTIGATOR'S BUILDING (1)								
Concrete foundations and slab	960	SF	7.75	7,440	9.40	9,024	17.15	16,464
Roof structure	960	SF	11.00	10,560	14.00	13,440	25.00	24,000
Exterior closure, doors and windows	1,536	SF	22.00	33,792	13.00	19,968	35.00	53,760
Insulated metal roofing	960	SF	7.70	7,392	5.20	4,992	12.90	12,384
Interior construction - offices, toilets, etc.	960	SF	15.00	14,400	21.00	20,160	36.00	34,560
Plumbing	960	SF	5.00	4,800	7.00	6,720	12.00	11,520
Ventilation and controls	960	SF	6.00	5,760	8.00	7,680	14.00	13,440
Electric heat	960	SF	5.00	4,800	6.50	6,240	11.50	11,040
Fire protection	960	SF	2.50	2,400	3.20	3,072	5.70	5,472
Lighting and power	960	SF	7.00	6,720	8.50	8,160	15.50	14,880
Fire alarm, data and communications	960	SF	3.50	3,360	4.70	4,512	8.20	7,872
SUBTOTAL:				*$ 169,442*		*$ 251,844*		*$ 421,286*
Labor Premium Time	16.70%					42,058		42,058
TOTAL ESTIMATED COST:				***$ 169,442***		***$ 293,902***		***$ 463,344***

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4. FIRE TRAINING MOCKS SUBDIVISION (5 EACH)

CONCEPT DESIGN COST SUMMARY (REVISION 2)

		Material	*Labor*	*Total*
01 - SITE WORK				
Site Preparation and Improvements		$ 109,963	$ 151,546	$ 261,509
Site Mechanical		47,930	40,402	88,332
Site Electrical		11,554	9,415	20,969
02 - SUBSTRUCTURE		0	0	0
03 - SUPERSTRUCTURE		0	0	0
04 - EXTERIOR CLOSURE		0	0	0
05 - ROOF SYSTEMS		0	0	0
06 - INTERIOR CONSTRUCTION		0	0	0
07 - CONVEYING SYSTEMS		0	0	0
08 - MECHANICAL		0	0	0
09 - ELECTRICAL		0	0	0
10 - EQUIPMENT		0	0	0
11 - SPECIAL CONSTRUCTION		765,085	952,728	1,717,813
SUBTOTAL DIRECT WORK:		*$ 934,532*	*$ 1,154,091*	*$ 2,088,623*
12 - GENERAL REQUIREMENTS, OVERHEAD AND PROFIT	24.00%			501,270
SUBTOTAL:				*$ 2,589,893*
13 - CONTINGENCIES AND ESCALATION	15.00%			388,484
TOTAL ESTIMATED CONSTRUCTION COST:				***$ 2,978,377***

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4. FIRE TRAINING MOCKS SUBDIVISION (5 EACH) ***01 - SITE WORK*** ***Site Preparation and Improvements***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
PREPARATION								
Site survey and staking	1.50	AC	750.00	1,125	6000.00	9,000	6750.00	10,125
Erosion and pollution control	55,395	SF	0.03	1,662	0.07	3,878	0.10	5,540
EARTHWORK								
Cut trees and grub up roots	1.50	AC			6000.00	9,000	6000.00	9,000
Excavate and haul away organics, average 24" deep	2,572	CY			8.15	20,962	8.15	20,962
Excavate and haul away organics, average 12" deep at landscaping	1,128	CY			8.15	9,193	8.15	9,193
Average 18" deep NFS fill, compacted	2,315	CY	14.50	33,568	7.50	17,363	22.00	50,931
Soil compaction tests (1 per 500 CY)	5	EA	225.00	1,125			225.00	1,125
IMPROVEMENTS								
AC Pavements								
4" D1 leveling course, compacted	381	CY	19.00	7,239	8.00	3,048	27.00	10,287
3" AC pavements (437 tons)	24,945	SF	1.55	38,665	1.15	28,687	2.70	67,352
Match existing pavement	70	LF	2.70	189	3.50	245	6.20	434

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4. FIRE TRAINING MOCKS SUBDIVISION (5 EACH)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
01 - SITE WORK	*QUANTITY*	*UNIT*	*RATE*	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
Site Preparation and Improvements			*$*	*$*	*$*	*$*	*$*	*$*
IMPROVEMENTS (Continued)								
AC Pavements (Continued)								
Pavement markings allowance	1	LOT	150.00	150	250.00	250	400.00	400
Signage allowance	1	LOT	300.00	300	500.00	500	800.00	800
Landscaping around buildings (4)	30,450	SF	0.25	7,613	0.20	6,090	0.45	13,703
SUBTOTAL:				*$ 91,636*		*$ 108,216*		*$ 199,852*
Labor Premium Time	16.70%					18,072		18,072
SUBTOTAL:				*$ 91,636*		*$ 126,288*		*$ 217,924*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			18,327		25,258		43,585
TOTAL ESTIMATED COST:				***$ 109,963***		***$ 151,546***		***$ 261,509***

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4. FIRE TRAINING MOCKS SUBDIVISION (5 EACH)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
01 - SITE WORK	*QUANTITY*	*UNIT*	*RATE*	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
Site Mechanical			*$*	*$*	*$*	*$*	*$*	*$*
LOOP WATER PIPING								
10" diameter HDPE loop water lines and fittings, including trenching	880	LF	22.90	20,152	18.75	16,500	41.65	36,652
10" valves	4	EA	875.00	3,500	415.00	1,660	1290.00	5,160
10" connections	4	EA	225.00	900	350.00	1,400	575.00	2,300
Single pumper fire hydrants and connections	4	EA	2850.00	11,400	1350.00	5,400	4200.00	16,800
4"x48" concrete filled pipe bollards and bases	12	EA	320.00	3,840	270.00	3,240	590.00	7,080
Testing	1	LOT	150.00	150	650.00	650	800.00	800
SEWER								None
NATURAL GAS								None
SUBTOTAL:				*$ 39,942*		*$ 28,850*		*$ 68,792*
Labor Premium Time	16.70%					4,818		4,818
SUBTOTAL:				*$ 39,942*		*$ 33,668*		*$ 73,610*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			7,988		6,734		14,722
TOTAL ESTIMATED COST:				***$ 47,930***		***$ 40,402***		***$ 88,332***

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4. FIRE TRAINING MOCKS SUBDIVISION (5 EACH)			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
01 - SITE WORK	*QUANTITY*	*UNIT*	*RATE*	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
Site Electrical			*$*	*$*	*$*	*$*	*$*	*$*
LIGHTING								
20'0" poles and bases	2	EA	1330.00	2,660	750.00	1,500	2080.00	4,160
LED fixtures	4	EA	1270.00	5,080	380.00	1,520	1650.00	6,600
1" diameter PVC buried conduits	340	LF	4.30	1,462	7.50	2,550	11.80	4,012
#10 wiring (3)	1,320	LF	0.24	317	0.65	858	0.89	1,175
Fixture connections	4	EA	8.50	34	17.50	70	26.00	104
Testing	1	LOT	75.00	75	225.00	225	300.00	300
DATA/COMMUNICATIONS								None
SUBTOTAL:				*$ 9,628*		*$ 6,723*		*$ 16,351*
Labor Premium Time	16.70%					1,123		1,123
SUBTOTAL:				*$ 9,628*		*$ 7,846*		*$ 17,474*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			1,926		1,569		3,495
TOTAL ESTIMATED COST:				***$ 11,554***		***$ 9,415***		***$ 20,969***

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4. FIRE TRAINING MOCKS SUBDIVISION (5 EACH) ***11 - SPECIAL CONSTRUCTION*** ***Buildings and Structures***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
SINGLE FAMILY HOUSING (5)								
Concrete foundations and slab	5,940	SF	7.75	46,035	9.40	55,836	17.15	101,871
Roof structure	5,940	SF	11.00	65,340	14.00	83,160	25.00	148,500
Uninsulated exterior closure, doors and windows	7,200	SF	13.00	93,600	10.00	72,000	23.00	165,600
Cold metal roofing	5,940	SF	5.50	32,670	3.20	19,008	8.70	51,678
Unfinished interior construction	5,940	SF	4.20	24,948	6.50	38,610	10.70	63,558
Mechanical system								None
Minimal lighting and power	5,940	SF	3.80	22,572	4.55	27,027	8.35	49,599
TWO-STORY MULTI-FAMILY HOUSING (1)								
Concrete foundations and slab	4,200	SF	7.75	32,550	9.40	39,480	17.15	72,030
Floor structure	3,840	SF	8.00	30,720	12.00	46,080	20.00	76,800
Stairs and railings (2)	360	SF	17.00	6,120	15.00	5,400	32.00	11,520
Roof structure	4,200	SF	11.00	46,200	14.00	58,800	25.00	105,000
Uninsulated exterior closure, doors and windows	6,500	SF	13.00	84,500	10.00	65,000	23.00	149,500
Cold metal roofing	4,200	SF	5.50	23,100	3.20	13,440	8.70	36,540

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4. FIRE TRAINING MOCKS SUBDIVISION (5 EACH) ***11 - SPECIAL CONSTRUCTION*** ***Buildings and Structures***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
TWO-STORY MULTI-FAMILY HOUSING (1) (Continued)								
Unfinished interior construction (two floors)	8,400	SF	4.20	35,280	6.50	54,600	10.70	89,880
Mechanical system								None
Minimal lighting and power	8,400	SF	3.80	31,920	4.55	38,220	8.35	70,140
LOW RISE COMMERCIAL BUILDING (1)								
Concrete foundations and slab	4,200	SF	7.75	32,550	9.40	39,480	17.15	72,030
Roof structure	4,200	SF	11.00	46,200	14.00	58,800	25.00	105,000
Uninsulated exterior closure, doors and windows	4,160	SF	13.00	54,080	10.00	41,600	23.00	95,680
Cold metal roofing	4,200	SF	5.50	23,100	3.20	13,440	8.70	36,540
Unfinished interior construction	4,200	SF	4.20	17,640	6.50	27,300	10.70	44,940
Mechanical system								None
Minimal lighting and power	4,200	SF	3.80	15,960	4.55	19,110	8.35	35,070
SUBTOTAL:				*$ 765,085*		*$ 816,391*		*$ 1,581,476*
Labor Premium Time	16.70%					136,337		136,337
TOTAL ESTIMATED COST:				***$ 765,085***		***$ 952,728***		***$ 1,717,813***

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5. LIVE FIRE PROPS YARD (4 EACH)

CONCEPT DESIGN COST SUMMARY (REVISION 2)

		Material	*Labor*	*Total*
01 - SITE WORK				
Site Preparation and Improvements		$ 111,944	$ 131,470	$ 243,414
Site Mechanical		0	0	0
Site Electrical		28,116	21,776	49,892
02 - SUBSTRUCTURE		0	0	0
03 - SUPERSTRUCTURE		0	0	0
04 - EXTERIOR CLOSURE		0	0	0
05 - ROOF SYSTEMS		0	0	0
06 - INTERIOR CONSTRUCTION		0	0	0
07 - CONVEYING SYSTEMS		0	0	0
08 - MECHANICAL		0	0	0
09 - ELECTRICAL		0	0	0
10 - EQUIPMENT		0	0	0
11 - SPECIAL CONSTRUCTION		0	0	0
SUBTOTAL DIRECT WORK:		*$ 140,060*	*$ 153,246*	*$ 293,306*
12 - GENERAL REQUIREMENTS, OVERHEAD AND PROFIT	20.00%			58,661
SUBTOTAL:				*$ 351,967*
13 - CONTINGENCIES AND ESCALATION	15.00%			52,795
TOTAL ESTIMATED CONSTRUCTION COST:				***$ 404,762***

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5. LIVE FIRE PROPS YARD (4 EACH) ***01 - SITE WORK*** ***Site Preparation and Improvements***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
PREPARATION								
Site survey and staking	1.55	AC	750.00	1,163	6000.00	9,300	6750.00	10,463
Erosion and pollution control	64,950	SF	0.03	1,949	0.07	4,547	0.10	6,496
EARTHWORK								
Excavate and dispose organics on site, average 24" deep	4,990	CY			5.20	25,948	5.20	25,948
Average 18" deep NFS fill, compacted	4,490	CY	14.50	65,105	7.50	33,675	22.00	98,780
Soil compaction tests (1 per 500 CY)	9	EA	225.00	2,025			225.00	2,025
IMPROVEMENTS								
Signage, Etc.								
Signage allowance	1	LOT	500.00	500	700.00	700	1200.00	1,200
18" CMP culverts with flare ends (2)	90	LF	22.50	2,025	25.00	2,250	47.50	4,275
Prop Pads, Etc.								
6" thick x 30" x 30" fiber reinforced concrete pads (4)	3,600	SF	5.70	20,520	4.85	17,460	10.55	37,980

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5. LIVE FIRE PROPS YARD (4 EACH) ***01 - SITE WORK*** ***Site Preparation and Improvements***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
IMPROVEMENTS (Continued)								
Prop Pads, Etc. (Continued)								
Miscellaneous props	4	EA						By CMSFD
SUBTOTAL:				*$ 93,287*		*$ 93,880*		*$ 187,167*
Labor Premium Time	16.70%					15,678		15,678
SUBTOTAL:				*$ 93,287*		*$ 109,558*		*$ 202,845*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			18,657		21,912		40,569
TOTAL ESTIMATED COST:				***$ 111,944***		***$ 131,470***		***$ 243,414***

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5. LIVE FIRE PROPS YARD (4 EACH) ***01 - SITE WORK*** ***Site Mechanical***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
WATER								None
STORM DRAIN								None
NATURAL GAS								None
MISCELLANEOUS								
Test system	0	LOT						
Propane gas cylinders, wood pallets, straw, etc.	1	LOT						By CMSFD

TOTAL ESTIMATED COST:

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5. LIVE FIRE PROPS YARD (4 EACH) ***01 - SITE WORK*** ***Site Electrical***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
LIGHTING								
20'0" poles and bases	5	EA	1330.00	6,650	750.00	3,750	2080.00	10,400
LED fixtures	10	EA	1270.00	12,700	380.00	3,800	1650.00	16,500
1" diameter PVC buried conduits	750	LF	4.30	3,225	7.50	5,625	11.80	8,850
#10 wiring (3)	3,000	LF	0.24	720	0.65	1,950	0.89	2,670
Fixture connections	10	EA	8.50	85	17.50	175	26.00	260
Testing	1	LOT	50.00	50	250.00	250	300.00	300
SUBTOTAL:				*$ 23,430*		*$ 15,550*		*$ 38,980*
Labor Premium Time	16.70%					2,597		2,597
SUBTOTAL:				*$ 23,430*		*$ 18,147*		*$ 41,577*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			4,686		3,629		8,315
TOTAL ESTIMATED COST:				***$ 28,116***		***$ 21,776***		***$ 49,892***

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6. REMOTE REHAB BUILDING

CONCEPT DESIGN COST SUMMARY (REVISION 2)

		Material	*Labor*	*Total*
01 - SITE WORK				
Site Preparation and Improvements		$ 6,821	$ 8,166	$ 14,987
Site Mechanical		11,880	7,380	19,260
Site Electrical		13,624	11,924	25,548
02 - SUBSTRUCTURE		0	0	0
03 - SUPERSTRUCTURE		0	0	0
04 - EXTERIOR CLOSURE		0	0	0
05 - ROOF SYSTEMS		0	0	0
06 - INTERIOR CONSTRUCTION		0	0	0
07 - CONVEYING SYSTEMS		0	0	0
08 - MECHANICAL		0	0	0
09 - ELECTRICAL		0	0	0
10 - EQUIPMENT		0	0	0
11 - SPECIAL CONSTRUCTION		202,010	238,733	440,743
SUBTOTAL DIRECT WORK:		*$ 234,335*	*$ 266,203*	*$ 500,538*
12 - GENERAL REQUIREMENTS, OVERHEAD AND PROFIT	24.00%			120,129
SUBTOTAL:				*$ 620,667*
13 - CONTINGENCIES AND ESCALATION	15.00%			93,100
TOTAL ESTIMATED CONSTRUCTION COST:				***$ 713,767***

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6. REMOTE REHAB BUILDING ***01 - SITE WORK*** ***Site Preparation and Improvements***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
PREPARATION (BUILDING ONLY)								
Site survey and staking	0.13	AC	750.00	98	6000.00	780	6750.00	878
Erosion and pollution control	3,245	SF	0.03	97	0.07	227	0.10	324
EARTHWORK								
Excavate and dispose organics on site, average 24" deep	404	CY			5.20	2,101	5.20	2,101
Average 18" deep NFS fill, compacted	363	CY	14.50	5,264	7.50	2,723	22.00	7,987
Soil compaction test (1 per 500 CY)	1	EA	225.00	225			225.00	225
IMPROVEMENTS								
AC Pavements								None
SUBTOTAL:				*$ 5,684*		*$ 5,831*		*$ 11,515*
Labor Premium Time	16.70%					974		974
SUBTOTAL:				*$ 5,684*		*$ 6,805*		*$ 12,489*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			1,137		1,361		2,498
TOTAL ESTIMATED COST:				***$ 6,821***		***$ 8,166***		***$ 14,987***

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6. REMOTE REHAB BUILDING ***01 - SITE WORK*** ***Site Mechanical***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
WATER								
2" diameter HDPE water lines including trenching	120	LF	12.70	1,524	15.00	1,800	27.70	3,324
2" valve	1	EA	75.00	75	55.00	55	130.00	130
2" connections	2	EA	48.00	96	75.00	150	123.00	246
Testing	1	LOT	50.00	50	150.00	150	200.00	200
SEWER								
1,000 gallon buried septic tank	1	EA	3850.00	3,850	1270.00	1,270	5120.00	5,120
50'0"x3'0"x8'0" deep sewer rock infiltration trench (1)	45	CY	82.00	3,690	20.00	900	102.00	4,590
4" diameter HDPE piping	50	LF	7.70	385	10.50	525	18.20	910
4" connections	2	EA	90.00	180	135.00	270	225.00	450
Testing	1	LOT	50.00	50	150.00	150	200.00	200
SUBTOTAL:				*$ 9,900*		*$ 5,270*		*$ 15,170*
Labor Premium Time	16.70%					880		880
SUBTOTAL:				*$ 9,900*		*$ 6,150*		*$ 16,050*

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6. REMOTE REHAB BUILDING ***01 - SITE WORK*** ***Site Mechanical***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			1,980		1,230		3,210
TOTAL ESTIMATED COST:				***$ 11,880***		***$ 7,380***		***$ 19,260***

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6. REMOTE REHAB BUILDING ***01 - SITE WORK*** ***Site Electrical***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
POWER								
1 1/2" diameter buried power line	130	LF	7.70	1,001	12.50	1,625	20.20	2,626
Meter base and disconnect	1	EA	875.00	875	450.00	450	1325.00	1,325
LIGHTING								
20'0" poles and bases	2	EA	1330.00	2,660	750.00	1,500	2080.00	4,160
LED fixtures	4	EA	1270.00	5,080	380.00	1,520	1650.00	6,600
1" diameter PVC buried conduits	310	LF	4.30	1,333	7.50	2,325	11.80	3,658
#10 wiring (3)	1,230	LF	0.24	295	0.65	800	0.89	1,095
Fixture connections	4	EA	8.50	34	17.50	70	26.00	104
Testing	1	LOT	75.00	75	225.00	225	300.00	300
DATA/COMMUNICATIONS								None
SUBTOTAL:				*$ 11,353*		*$ 8,515*		*$ 19,868*
Labor Premium Time	16.70%					1,422		1,422
SUBTOTAL:				*$ 11,353*		*$ 9,937*		*$ 21,290*

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6. REMOTE REHAB BUILDING ***01 - SITE WORK*** ***Site Electrical***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			2,271		1,987		4,258
TOTAL ESTIMATED COST:				***$ 13,624***		***$ 11,924***		***$ 25,548***

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6. REMOTE REHAB BUILDING ***11 - SPECIAL CONSTRUCTION*** ***Buildings and Structures***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
Concrete foundations and slab	2,200	SF	7.75	17,050	9.40	20,680	17.15	37,730
Roof structure	2,200	SF	11.00	24,200	14.00	30,800	25.00	55,000
Exterior closure, doors and windows	2,660	SF	22.00	58,520	13.00	34,580	35.00	93,100
Insulated metal roofing	2,200	SF	7.70	16,940	5.20	11,440	12.90	28,380
Interior construction for rest areas, toilets, etc.	2,200	SF	15.00	33,000	21.00	46,200	36.00	79,200
Plumbing, toilets	2	RMS	2500.00	5,000	130.00	260	2630.00	5,260
Ventilation	2,200	SF	6.00	13,200	8.00	17,600	14.00	30,800
Electric heat	2,200	SF	5.00	11,000	6.50	14,300	11.50	25,300
Fire protection	2,200	SF	1.80	3,960	2.30	5,060	4.10	9,020
Lighting and power	2,200	SF	7.00	15,400	8.55	18,810	15.55	34,210
Fire alarm system	2,200	SF	1.70	3,740	2.20	4,840	3.90	8,580
SUBTOTAL:				*$ 202,010*		*$ 204,570*		*$ 406,580*
Labor Premium Time	16.70%					34,163		34,163
TOTAL ESTIMATED COST:				***$ 202,010***		***$ 238,733***		***$ 440,743***

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7. WATER WELL, WATER STORAGE TANK AND WELLHOUSE/CONTROLS BUILDING

CONCEPT DESIGN COST SUMMARY (REVISION 2)

		Material	*Labor*	*Total*
01 - SITE WORK				
Site Preparation and Improvements		$ 54,863	$ 53,005	$ 107,868
Site Mechanical		178,062	163,422	341,484
Site Electrical		1,241	1,867	3,108
02 - SUBSTRUCTURE		0	0	0
03 - SUPERSTRUCTURE		0	0	0
04 - EXTERIOR CLOSURE		0	0	0
05 - ROOF SYSTEMS		0	0	0
06 - INTERIOR CONSTRUCTION		0	0	0
07 - CONVEYING SYSTEMS		0	0	0
08 - MECHANICAL		0	0	0
09 - ELECTRICAL		0	0	0
10 - EQUIPMENT		0	0	0
11 - SPECIAL CONSTRUCTION				
Wellhouse/Controls Building (1)		139,533	104,529	244,062
SUBTOTAL DIRECT WORK:		*$ 373,699*	*$ 322,823*	*$ 696,522*
12 - GENERAL REQUIREMENTS, OVERHEAD AND PROFIT	24.00%			167,165
SUBTOTAL:				*$ 863,687*
13 - CONTINGENCIES AND ESCALATION	15.00%			129,553
TOTAL ESTIMATED CONSTRUCTION COST:				***$ 993,240***

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7. WELL/STORAGE TANK/WELLHOUSE/CONTROLS BLDG.			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
01 - SITE WORK	*QUANTITY*	*UNIT*	*RATE*	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
Site Preparation and Improvements			*$*	*$*	*$*	*$*	*$*	*$*
PREPARATION								
Site survey and staking	0.36	AC	750.00	270	6000.00	2,160	6750.00	2,430
Erosion and pollution control	15,680	SF	0.03	470	0.07	1,098	0.10	1,568
EARTHWORK								
Excavate and dispose organics on site, average 24" deep	1,162	CY			5.20	6,042	5.20	6,042
Average 18" deep NFS fill, compacted	1,045	CY	14.50	15,153	7.50	7,838	22.00	22,991
Soil compaction tests (1 per 500 CY)	2	EA	225.00	450			225.00	450
IMPROVEMENTS								
AC Pavements								
4" D1 leveling course, compacted	240	CY	19.00	4,560	8.00	1,920	27.00	6,480
3" AC pavements (274 tons)	15,680	SF	1.55	24,304	1.15	18,032	2.70	42,336
Match existing pavement	60	LF	2.70	162	3.50	210	6.20	372
Pavement markings allowance	1	LOT	100.00	100	200.00	200	300.00	300
Signage allowance	1	LOT	250.00	250	350.00	350	600.00	600
SUBTOTAL:				*$ 45,719*		*$ 37,850*		*$ 83,569*

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7. WELL/STORAGE TANK/WELLHOUSE/CONTROLS BLDG.			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
01 - SITE WORK	*QUANTITY*	*UNIT*	*RATE*	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
Site Preparation and Improvements			*$*	*$*	*$*	*$*	*$*	*$*
Labor Premium Time	16.70%					6,321		6,321
SUBTOTAL:				*$ 45,719*		*$ 44,171*		*$ 89,890*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			9,144		8,834		17,978
TOTAL ESTIMATED COST:				***$ 54,863***		***$ 53,005***		***$ 107,868***

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7. WELL/STORAGE TANK/WELLHOUSE/CONTROLS BLDG. ***01 - SITE WORK*** ***Site Mechanical***	*QUANTITY*	*UNIT*	*MATERIAL* *RATE* *$*	*MATERIAL* *TOTAL* *$*	*LABOR* *RATE* *$*	*LABOR* *TOTAL* *$*	*TOTAL UNIT RATE* *$*	*TOTAL MATERIAL/LABOR* *$*
WATER WELL								
Develop 8" diameter x 200'0" deep non-potable water well system	1	EA	24500.00	24,500	10700.00	10,700	35200.00	35,200
300 GPM, 20 HP submersible water pump	1	EA	6550.00	6,550	2750.00	2,750	9300.00	9,300
8" well cap inside controls building	1	EA	380.00	380	250.00	250	630.00	630
2" diameter SDR11 insulated pipe and fittings including trenching from pump to water tank	35	LF	12.70	445	15.20	532	27.90	977
2" pitless adaptor	1	EA	125.00	125	110.00	110	235.00	235
4" diameter SDR11 insulated pipe and fittings including trenching from tank to 10" main loop	50	LF	12.70	635	15.20	760	27.90	1,395
2" valve	1	EA	85.00	85	75.00	75	160.00	160
4" valve	1	EA	130.00	130	90.00	90	220.00	220
2" to 4" connections	4	EA	48.00	192	70.00	280	118.00	472
10" diameter HDPE pipe and fittings	120	LF	22.90	2,748	18.75	2,250	41.65	4,998
Valve and connection to existing 10" diameter pipe	2	EA	1120.00	2,240	580.00	1,160	1700.00	3,400
10" connection to building	2	EA	225.00	450	350.00	700	575.00	1,150
Test and disinfect well	1	LOT	150.00	150	650.00	650	800.00	800

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7. WELL/STORAGE TANK/WELLHOUSE/CONTROLS BLDG.			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
01 - SITE WORK	*QUANTITY*	*UNIT*	*RATE*	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
Site Mechanical			*$*	*$*	*$*	*$*	*$*	*$*
200,000 GALLON WATER STORAGE TANK								
10"x42" deep reinforced concrete ring wall (18 CY)	550	SF	18.00	9,900	13.50	7,425	31.50	17,325
1"x18" embedded bolts, 24" o/c	78	EA	10.25	800	20.00	1,560	30.25	2,360
NFS backfill under tank pad	305	CY	14.50	4,423	7.50	2,288	22.00	6,711
1/2" thick insulated jacketed bolted plate tank base	1,963	SF	14.00	27,482	11.00	21,593	25.00	49,075
1/2" to 1/4" thick insulated jacketed bolted plate tank walls	2,198	SF	12.20	26,816	10.00	21,980	22.20	48,796
1/4" thick insulated bolted tank top	1,963	SF	8.50	16,686	5.70	11,189	14.20	27,875
Manholes, vents, manifolds, ladders, etc.	1	LOT	7500.00	7,500	5000.00	5,000	12500.00	12,500
Supply and return piping and valves	1	LOT	4700.00	4,700	2000.00	2,000	6700.00	6,700
(3) coats epoxy paint to internal surfaces	6,124	SF	0.60	3,674	2.50	15,310	3.10	18,984
Tank labels, signs, etc.	1	LOT	250.00	250	150.00	150	400.00	400
NATURAL GAS								
2" gas regulator and meter	1	EA	1370.00	1,370	700.00	700	2070.00	2,070
2" diameter buried gas piping	570	LF	8.20	4,674	10.50	5,985	18.70	10,659

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7. WELL/STORAGE TANK/WELLHOUSE/CONTROLS BLDG.			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
01 - SITE WORK	*QUANTITY*	*UNIT*	*RATE*	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
Site Mechanical			*$*	*$*	*$*	*$*	*$*	*$*
NATURAL GAS (Continued)								
2" building connection	1	EA	80.00	80	110.00	110	190.00	190
2" service line connection including fee	1	LOT	1300.00	1,300	600.00	600	1900.00	1,900
Test system	1	LOT	100.00	100	500.00	500	600.00	600
SUBTOTAL:				*$ 148,385*		*$ 116,697*		*$ 265,082*
Labor Premium Time	16.70%					19,488		19,488
SUBTOTAL:				*$ 148,385*		*$ 136,185*		*$ 284,570*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			29,677		27,237		56,914
TOTAL ESTIMATED COST:				***$ 178,062***		***$ 163,422***		***$ 341,484***

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7. WELL/STORAGE TANK/WELLHOUSE/CONTROLS BLDG.			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
01 - SITE WORK	*QUANTITY*	*UNIT*	*RATE*	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
Site Electrical			*$*	*$*	*$*	*$*	*$*	*$*
POWER								
Buried power from loop road	50	LF	8.50	425	7.70	385	16.20	810
Connections	2	EA	55.00	110	85.00	170	140.00	280
Thaw wire to water piping	85	LF	2.10	179	1.80	153	3.90	332
2" diameter data/communications conduits to wellhouse building	50	LF	5.40	270	7.50	375	12.90	645
Test and tag service	1	LOT	50.00	50	250.00	250	300.00	300
SUBTOTAL:				*$ 1,034*		*$ 1,333*		*$ 2,367*
Labor Premium Time	16.70%					223		223
SUBTOTAL:				*$ 1,034*		*$ 1,556*		*$ 2,590*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			207		311		518
TOTAL ESTIMATED COST:				***$ 1,241***		***$ 1,867***		***$ 3,108***

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7. WELL/STORAGE TANK/WELLHOUSE/CONTROLS BLDG. ***11 - SPECIAL CONSTRUCTION*** ***Wellhouse/Controls Building (1)***	*QUANTITY*	*UNIT*	*MATERIAL* *RATE* *$*	*MATERIAL* *TOTAL* *$*	*LABOR* *RATE* *$*	*LABOR* *TOTAL* *$*	*TOTAL UNIT RATE* *$*	*TOTAL MATERIAL/LABOR* *$*
Concrete foundations and slab	480	SF	9.00	4,320	10.50	5,040	19.50	9,360
Roof structure	480	SF	18.75	9,000	14.00	6,720	32.75	15,720
Exterior closure, doors and windows	1,104	SF	22.00	24,288	13.00	14,352	35.00	38,640
Insulated metal roofing	480	SF	10.50	5,040	5.70	2,736	16.20	7,776
Interior construction and finishes	480	SF	22.00	10,560	27.00	12,960	49.00	23,520
Miscellaneous plumbing fixtures and piping	480	SF	8.00	3,840	12.00	5,760	20.00	9,600
200 GPM, __ HP booster pump	1	EA	4875.00	4,875	1350.00	1,350	6225.00	6,225
500 GPM, __ HP booster pump	1	EA	7750.00	7,750	1850.00	1,850	9600.00	9,600
2,000 GPM, __ HP booster pump	1	EA	13850.00	13,850	2775.00	2,775	16625.00	16,625
Ventilation fans, grilles, ducts	480	SF	32.00	15,360	17.00	8,160	49.00	23,520
Electric heating system	480	SF	10.70	5,136	6.50	3,120	17.20	8,256
Fire protection system	480	SF	5.80	2,784	4.15	1,992	9.95	4,776
Wellhouse pumps Scada controls system	1	LOT	22500.00	22,500	13750.00	13,750	36250.00	36,250
Lighting and power including conduit, wiring and connections	480	SF	12.50	6,000	10.20	4,896	22.70	10,896
Fire alarm system	480	SF	5.00	2,400	4.00	1,920	9.00	4,320

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7. WELL/STORAGE TANK/WELLHOUSE/CONTROLS BLDG.			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
11 - SPECIAL CONSTRUCTION	*QUANTITY*	*UNIT*	*RATE*	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
Wellhouse/Controls Building (1)			*$*	*$*	*$*	*$*	*$*	*$*
Data/communications	480	SF	3.50	1,680	3.00	1,440	6.50	3,120
Testing mechanical and electrical system	1	LOT	150.00	150	750.00	750	900.00	900
SUBTOTAL:				*$ 139,533*		*$ 89,571*		*$ 229,104*
Labor Premium Time	16.70%					14,958		14,958
TOTAL ESTIMATED COST:				***$ 139,533***		***$ 104,529***		***$ 244,062***

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8. WORK SHOP, DRILL YARD, VENTILATION AND FORCIBLE ENTRY BREACH

CONCEPT DESIGN COST SUMMARY (REVISION 2)

		Material	*Labor*	*Total*
01 - SITE WORK				
Site Preparation and Improvements		$ 70,932	$ 64,200	$ 135,132
Site Mechanical		0	0	0
Site Electrical		8,794	8,632	17,426
02 - SUBSTRUCTURE		0	0	0
03 - SUPERSTRUCTURE		0	0	0
04 - EXTERIOR CLOSURE		0	0	0
05 - ROOF SYSTEMS		0	0	0
06 - INTERIOR CONSTRUCTION		0	0	0
07 - CONVEYING SYSTEMS		0	0	0
08 - MECHANICAL		0	0	0
09 - ELECTRICAL		0	0	0
10 - EQUIPMENT		0	0	0
11 - SPECIAL CONSTRUCTION		92,496	106,766	199,262
SUBTOTAL DIRECT WORK:		*$ 172,222*	*$ 179,598*	*$ 351,820*
12 - GENERAL REQUIREMENTS, OVERHEAD AND PROFIT	20.00%			70,364
SUBTOTAL:				*$ 422,184*
13 - CONTINGENCIES AND ESCALATION	15.00%			63,328
TOTAL ESTIMATED CONSTRUCTION COST:				***$ 485,512***

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8. WORK SHOP, DRILL YARD, VENTILATION AND FORCIBLE ENTRY BREACH ***01 - SITE WORK*** ***Site Preparation and Improvements***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
PREPARATION								
Site survey and staking	0.50	AC	750.00	375	6000.00	3,000	6750.00	3,375
Erosion and pollution control	3,520	SF	0.03	106	0.07	246	0.10	352
EARTHWORK								
Excavate and dispose organics on site, average 24" deep	1,615	CY			5.20	8,398	5.20	8,398
Average 18" deep NFS fill, compacted	1,452	CY	14.50	21,054	7.50	10,890	22.00	31,944
Soil compaction tests (1 per 500 CY)	3	EA	225.00	675			225.00	675
IMPROVEMENTS								
Gravel Pads								None
AC Pavements								None
Props Pads, Etc.								
6" thick x 30" x 30" fiber reinforced concrete pads (4)	3,600	SF	5.70	20,520	4.85	17,460	10.55	37,980
36" high perimeter guardrails	390	LF	42.00	16,380	15.00	5,850	57.00	22,230

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8. WORK SHOP, DRILL YARD, VENTILATION AND FORCIBLE ENTRY BREACH ***01 - SITE WORK*** ***Site Preparation and Improvements***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
IMPROVEMENTS (Continued)								
Props Pads, Etc. (Continued)								
Miscellaneous props	4	EA						By CMSFD
SUBTOTAL:				*$ 59,110*		*$ 45,844*		*$ 104,954*
Labor Premium Time	16.70%					7,656		7,656
SUBTOTAL:				*$ 59,110*		*$ 53,500*		*$ 112,610*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			11,822		10,700		22,522
TOTAL ESTIMATED COST:				***$ 70,932***		***$ 64,200***		***$ 135,132***

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8. WORK SHOP, DRILL YARD, VENTILATION AND FORCIBLE ENTRY BREACH ***01 - SITE WORK*** ***Site Mechanical***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
WATER								None
STORM DRAIN								None
NATURAL GAS								None
MISCELLANEOUS								
Test system	0	LOT						
Propane gas cylinders and piping	1	LOT						By CMSFD

TOTAL ESTIMATED COST:

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8. WORK SHOP, DRILL YARD, VENTILATION AND FORCIBLE ENTRY BREACH ***01 - SITE WORK*** ***Site Electrical***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
LIGHTING								
20'0" pole and base	1	EA	1330.00	1,330	750.00	750	2080.00	2,080
LED fixtures	3	EA	1270.00	3,810	380.00	1,140	1650.00	4,950
1" diameter PVC buried conduits	410	LF	4.30	1,763	7.50	3,075	11.80	4,838
#10 wiring (3)	1,455	LF	0.24	349	0.65	946	0.89	1,295
Fixture connections	3	EA	8.50	26	17.50	53	26.00	79
Testing	1	LOT	50.00	50	200.00	200	250.00	250
SUBTOTAL:				*$ 7,328*		*$ 6,164*		*$ 13,492*
Labor Premium Time	16.70%					1,029		1,029
SUBTOTAL:				*$ 7,328*		*$ 7,193*		*$ 14,521*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			1,466		1,439		2,905
TOTAL ESTIMATED COST:				***$ 8,794***		***$ 8,632***		***$ 17,426***

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8. WORK SHOP, DRILL YARD, VENTILATION AND FORCIBLE ENTRY BREACH 11 - SPECIAL CONSTRUCTION Wellhouse/Controls Building (1)	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE $	*TOTAL $*	*RATE $*	*TOTAL $*	*UNIT RATE $*	*MATERIAL/LABOR $*
TACTICAL WORKSHOP AND STORAGE (1)								
Concrete foundations and slab on grade	960	SF	7.75	7,440	9.40	9,024	17.15	16,464
Roof structure	960	SF	11.00	10,560	14.00	13,440	25.00	24,000
Exterior closure, doors and windows	1,536	SF	22.00	33,792	13.00	19,968	35.00	53,760
Insulated metal roofing	960	SF	7.70	7,392	5.20	4,992	12.90	12,384
Interior construction - shop, toilets, etc.	960	SF	12.00	11,520	17.00	16,320	29.00	27,840
Plumbing	0	SF	5.00		7.00		12.00	
Ventilation	960	SF	6.00	5,760	8.00	7,680	14.00	13,440
Electric heat	960	SF	5.00	4,800	6.50	6,240	11.50	11,040
Fire protection	960	SF	2.50	2,400	3.20	3,072	5.70	5,472
Lighting and power	960	SF	7.00	6,720	8.50	8,160	15.50	14,880
Fire alarm system	960	SF	2.20	2,112	2.70	2,592	4.90	4,704
SUBTOTAL:				*$ 92,496*		*$ 91,488*		*$ 183,984*
Labor Premium Time	16.70%					15,278		15,278
TOTAL ESTIMATED COST:				***$ 92,496***		***$ 106,766***		***$ 199,262***

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9. DRIVER, HELIPAD AND AERIAL TRAINING AREAS

CONCEPT DESIGN COST SUMMARY (REVISION 2)

		Material	*Labor*	*Total*
01 - SITE WORK				
Site Preparation and Improvements		$ 743,222	$ 722,429	$ 1,465,651
Site Electrical		39,199	38,834	78,033
02 - SUBSTRUCTURE		0	0	0
03 - SUPERSTRUCTURE		0	0	0
04 - EXTERIOR CLOSURE		0	0	0
05 - ROOF SYSTEMS		0	0	0
06 - INTERIOR CONSTRUCTION		0	0	0
07 - CONVEYING SYSTEMS		0	0	0
08 - MECHANICAL		0	0	0
09 - ELECTRICAL		0	0	0
10 - EQUIPMENT		0	0	0
11 - SPECIAL CONSTRUCTION		0	0	0
SUBTOTAL DIRECT WORK:		*$ 782,421*	*$ 761,263*	*$ 1,543,684*
12 - GENERAL REQUIREMENTS, OVERHEAD AND PROFIT	20.00%			308,737
SUBTOTAL:				*$ 1,852,421*
13 - CONTINGENCIES AND ESCALATION	15.00%			277,863
TOTAL ESTIMATED CONSTRUCTION COST:				***$ 2,130,284***

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9. DRIVER, HELIPAD AND AERIAL TRAINING AREAS			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
01 - SITE WORK	*QUANTITY*	*UNIT*	*RATE*	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
Site Preparation and Improvements			*$*	*$*	*$*	*$*	*$*	*$*
Note: All training equipment provided by CMSFD.								
PREPARATION								
Site survey and staking	4.82	AC	750.00	3,615	6000.00	28,920	6750.00	32,535
Erosion and pollution control	210,000	SF	0.03	6,300	0.07	14,700	0.10	21,000
EARTHWORK								
Excavate and dispose organics on site, average 24" deep	15,556	CY			5.20	80,891	5.20	80,891
Average 18" deep NFS fill, compacted	14,000	CY	14.50	203,000	7.50	105,000	22.00	308,000
Soil compaction tests (1 per 1,000 CY)	14	EA	225.00	3,150			225.00	3,150
IMPROVEMENTS								
4" D1 leveling course, compacted	3,210	CY	19.00	60,990	8.00	25,680	27.00	86,670
6" fiber reinforced concrete helipad	2,500	SF	5.70	14,250	4.85	12,125	10.55	26,375
3" AC pavement (3,632 tons)	207,528	SF	1.55	321,668	1.15	238,657	2.70	560,325
Match existing pavement	60	LF	2.70	162	3.50	210	6.20	372
Mark 24" wide x 50'0" diameter helipad landing circle	314	SF	1.20	377	1.75	550	2.95	927

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9. DRIVER, HELIPAD AND AERIAL TRAINING AREAS ***01 - SITE WORK*** ***Site Preparation and Improvements***	*QUANTITY*	*UNIT*	*MATERIAL* *RATE* *$*	*MATERIAL* *TOTAL* *$*	*LABOR* *RATE* *$*	*LABOR* *TOTAL* *$*	*TOTAL UNIT RATE* *$*	*TOTAL MATERIAL/LABOR* *$*
IMPROVEMENTS (Continued)								
Miscellaneous markings for different exercises	1	LOT	500.00	500	900.00	900	1400.00	1,400
Signage allowance	1	LOT	700.00	700	1200.00	1,200	1900.00	1,900
Develop storm water retention basin with liner	3,200	SF	1.45	4,640	2.20	7,040	3.65	11,680
SUBTOTAL:				*$ 619,352*		*$ 515,873*		*$ 1,135,225*
Labor Premium Time	16.70%					86,151		86,151
SUBTOTAL:				*$ 619,352*		*$ 602,024*		*$ 1,221,376*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			123,870		120,405		244,275
TOTAL ESTIMATED COST:				***$ 743,222***		***$ 722,429***		***$ 1,465,651***

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9. DRIVER, HELIPAD AND AERIAL TRAINING AREAS			*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
01 - SITE WORK	*QUANTITY*	*UNIT*	*RATE*	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
Site Electrical			*$*	*$*	*$*	*$*	*$*	*$*
LIGHTING								
20'0" poles and bases	8	EA	1330.00	10,640	750.00	6,000	2080.00	16,640
LED fixtures	10	EA	1270.00	12,700	380.00	3,800	1650.00	16,500
1" diameter PVC buried conduits	1,785	LF	4.30	7,676	7.50	13,388	11.80	21,064
#10 wiring (3)	6,105	LF	0.24	1,465	0.65	3,968	0.89	5,433
Fixture connections	10	EA	8.50	85	17.50	175	26.00	260
Testing	1	LOT	100.00	100	400.00	400	500.00	500
SUBTOTAL:				*$ 32,666*		*$ 27,731*		*$ 60,397*
Labor Premium Time	16.70%					4,631		4,631
SUBTOTAL:				*$ 32,666*		*$ 32,362*		*$ 65,028*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			6,533		6,472		13,005
TOTAL ESTIMATED COST:				***$ 39,199***		***$ 38,834***		***$ 78,033***

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10. URBAN RESCUE CONFINED SPACES, TRENCH RESCUE AND COLLAPSE PROPS

CONCEPT DESIGN COST SUMMARY (REVISION 2)

		Material	*Labor*	*Total*
01 - SITE WORK				
Site Preparation and Improvements		$ 244,163	$ 261,264	$ 505,427
Site Mechanical		30,000	14,705	44,705
Site Electrical		9,788	8,125	17,913
02 - SUBSTRUCTURE		0	0	0
03 - SUPERSTRUCTURE		0	0	0
04 - EXTERIOR CLOSURE		0	0	0
05 - ROOF SYSTEMS		0	0	0
06 - INTERIOR CONSTRUCTION		0	0	0
07 - CONVEYING SYSTEMS		0	0	0
08 - MECHANICAL		0	0	0
09 - ELECTRICAL		0	0	0
10 - EQUIPMENT		0	0	0
11 - SPECIAL CONSTRUCTION		0	0	0
SUBTOTAL DIRECT WORK:		*$ 283,951*	*$ 284,094*	*$ 568,045*
12 - GENERAL REQUIREMENTS, OVERHEAD AND PROFIT	20.00%			113,609
SUBTOTAL:				*$ 681,654*
13 - CONTINGENCIES AND ESCALATION	15.00%			102,248
TOTAL ESTIMATED CONSTRUCTION COST:				***$ 783,902***

HMS Project No.: 15058

10. URBAN RESCUE CONFINED SPACES, TRENCH RESCUE AND COLLAPSE PROPS ***01 - SITE WORK*** ***Site Preparation and Improvements***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
Note: All training equipment provided by CMSFD.								
PREPARATION								
Site survey and staking	2.86	AC	750.00	2,145	6000.00	17,160	6750.00	19,305
Erosion and pollution control	15,410	SF	0.03	462	0.07	1,079	0.10	1,541
EARTHWORK								
Excavate and dispose organics on site, average 24" deep	9,215	CY			5.20	47,918	5.20	47,918
Average 18" deep NFS fill, compacted	8,293	CY	14.50	120,249	7.50	62,198	22.00	182,447
Soil compaction tests (1 per 500 CY)	17	EA	225.00	3,825			225.00	3,825
IMPROVEMENTS								
Gravel Pads								
6" D1 gravel pad, compacted	2,523	CY	19.00	47,937	8.50	21,446	27.50	69,383
Finish grade	108,987	SF			0.15	16,348	0.15	16,348
AC Pavements								
4" D1 leveling course, compacted	236	CY	19.00	4,484	8.00	1,888	27.00	6,372

HMS Project No.: 15058

10. URBAN RESCUE CONFINED SPACES, TRENCH RESCUE AND COLLAPSE PROPS ***01 - SITE WORK*** ***Site Preparation and Improvements***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
IMPROVEMENTS (Continued)								
AC Pavements (Continued)								
3" AC pavement (270 tons)	15,410	SF	1.55	23,886	1.15	17,722	2.70	41,608
Match existing pavement	30	LF	2.70	81	3.50	105	6.20	186
Miscellaneous markings	1	LOT	150.00	150	250.00	250	400.00	400
Signage allowance	1	LOT	250.00	250	450.00	450	700.00	700
SUBTOTAL:				*$ 203,469*		*$ 186,564*		*$ 390,033*
Labor Premium Time	16.70%					31,156		31,156
SUBTOTAL:				*$ 203,469*		*$ 217,720*		*$ 421,189*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			40,694		43,544		84,238
TOTAL ESTIMATED COST:				***$ 244,163***		***$ 261,264***		***$ 505,427***

HMS Project No.: 15058

10. URBAN RESCUE CONFINED SPACES, TRENCH RESCUE AND COLLAPSE PROPS ***01 - SITE WORK*** ***Site Mechanical***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
Septic field system with rock lined trench	1	LOT	25000.00	25,000	10500.00	10,500	35500.00	35,500
SUBTOTAL:				*$ 25,000*		*$ 10,500*		*$ 35,500*
Labor Premium Time	16.70%					1,754		1,754
SUBTOTAL:				*$ 25,000*		*$ 12,254*		*$ 37,254*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			5,000		2,451		7,451
TOTAL ESTIMATED COST:				***$ 30,000***		***$ 14,705***		***$ 44,705***

HMS Project No.: 15058

10. URBAN RESCUE CONFINED SPACES, TRENCH RESCUE AND COLLAPSE PROPS ***01 - SITE WORK*** ***Site Electrical***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
Note: All training equipment provided by CMSFD.								
LIGHTING								
20'0" pole and base	1	EA	1330.00	1,330	750.00	750	2080.00	2,080
LED fixtures	4	EA	1270.00	5,080	380.00	1,520	1650.00	6,600
1" diameter PVC buried conduits	310	LF	4.30	1,333	7.50	2,325	11.80	3,658
#10 wiring (3)	1,230	LF	0.24	295	0.65	800	0.89	1,095
Fixture connections	4	EA	8.50	34	17.50	70	26.00	104
Connection to incoming power	1	EA	35.00	35	87.00	87	122.00	122
Testing	1	LOT	50.00	50	250.00	250	300.00	300
SUBTOTAL:				*$ 8,157*		*$ 5,802*		*$ 13,959*
Labor Premium Time	16.70%					969		969
SUBTOTAL:				*$ 8,157*		*$ 6,771*		*$ 14,928*
Subcontractor's Overhead and Profit on Material and Labor	20.00%			1,631		1,354		2,985
TOTAL ESTIMATED COST:				***$ 9,788***		***$ 8,125***		***$ 17,913***

APPENDIX B

Department of the Army Jurisdictional Determination

DEPARTMENT OF THE ARMY
ALASKA DISTRICT, U.S. ARMY CORPS OF ENGINEERS
REGULATORY DIVISION
P.O. BOX 6898
JBER, ALASKA 99506-0898

JUL 13 2015

Regulatory Division
POA-2015-403

Mat Su Borough/Capital Projects Department
Attention: Mr. John Harris
350 East Dahlia
Palmer, Alaska 99645

Dear Mr. Harris:

This letter is in response to your June 22, 2015 request for a Department of the Army (DA) jurisdictional determination for parcel # 8058 also known as your proposed Matanuska-Susitna Fire Training Center project. The property is located within Section 27, Township 17 N., Range 2 W., Seward Meridian, USGS 1:24 Quad Name: AK-Anchorage C-7 at Latitude 61.5326 ° N., Longitude 149.6102 ° W., Lot D3, Mat-Su Borough, near Wasilla, Alaska. Your project has been assigned number POA-2015-403, Crocker Creek, which should be referred to in all correspondence with us.

Based on our review of the information you provided and available to our office we have preliminarily determined the subject Matanuska-Susitna Fire Training Center contains wetlands, under the Corps' regulatory jurisdiction. See the attached Preliminary Jurisdictional Determination (PJD) Form. Please sign and return the form to our office. A PJD is not appealable. At any time you have the right to request and obtain an Approved Jurisdictional Determination, which can be appealed. If it is your intent to request an Approved JD, do not begin work until one is obtained.

Section 404 of the Clean Water Act requires that a DA permit be obtained for the placement or discharge of dredged and/or fill material into waters of the U.S., including jurisdictional wetlands (33 U.S.C. 1344). The Corps defines wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Section 10 of the Rivers and Harbors Act of 1899 requires that a DA permit be obtained for structures or work in or affecting navigable waters of the U.S. (33 U.S.C. 403). Section 10 waters are those waters subject to the ebb and flow of the tide shoreward to the mean high water mark, and/or other waters identified by the Alaska District.

Nothing in this letter excuses you from compliance with other Federal, State, or local statutes, ordinances, or regulations.

If you have questions, please contact me via email at Julie.C.Ruth@usace.army.mil, by mail at the address above, by phone at (907) 753-2735, or toll free from within Alaska at (800) 478-2712. For more information about the Regulatory Program, please visit our website at www.poa.usace.army.mil/Missions/Regulatory.aspx.

Sincerely,

Julie Ruth
Regulatory Specialist

Enclosure

Preliminary Jurisdictional Determination Form

This preliminary JD find that there "*may be*" waters of the United States on the subject project site that could be affected by the proposed activity based on the following information:

District Office: Alaska District Office | File/ORM #: 2015-403 | PJD Date: 7/1/2015

State: AK | City/County: Mat Su Borough

Nearest Waterbody: Crocker Creek

Project Location: Section(s) 27 | Township 17 N | Range 2 W | Meridian Seward

Name and Address of Person Requesting PJD:
John Harris, Project Manager
Mat Su Borough/Capital Projects Dept.
350 East Dahlia
Palmer, AK 99645

USGS Quad Map: AK-Anchorage C-7 | Latitude 61.5326 N | Longitude -149.6102 W

Subdivision Name, Block, Lot, Directions to Project Site: Lot D3, 6278 West Cruiser Drive: South on Knick Goose Bay Road to mile 6.9, turn right at the Central Mat Su Fire Department Station 6-2

Identify (Estimate) Amount of Waters in the Review Area

Non-Wetland Waters:

Linear ft	Width	Acres	Stream Flow

Wetlands

Acres	Cowardin Class
1.33	Palustrine, emergent

Name of Any Water Bodies on the Site Identified as Section 10 Waters: Tidal: n/a | Non-Tidal: n/a

☒ Office (Desk) Determination
☐ Field Determination
Date of Site Visit:

SUPPORTING DATA: Data Review for Preliminary JD (check all that apply - checked items should be included in case file and, where checked and requested, appropriately reference sources below)

- ☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Figure 2: Mat Su Fire Training Center
- ☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☒ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data Sheet prepared by the Corps
- ☐ Corps navigable waters' study:
  - ☐ USGS NHD Data.
  - ☐ USGS 8 and 12 digit HUC maps.
- ☐ U.S. Geological Survey map(s) Cite quad name:
- ☒ USDA Natural Resources Conservation Service Soil Survey. Citation: Unit 116, Cryaquepts
- ☒ National Wetlands Inventory map(s): Shows PEM1B
- ☐ State/Local Wetland Inventory map(s):
- ☐ FEMA/FIRM map(s):
- ☐ 100-year Floodplain Elevation:
- ☒ Photographs:
  - ☐ Aerial (Name & Date)
  - ☒ Other (Name & Date) Site photos provided by applicant
- ☐ Previous determination(s). File # and date of response letter:
- ☐ Other Information:

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Signature and Date of Regulatory Project Manager (REQUIRED)

Signature and Date of Person Requesting Preliminary JD (REQUIRED, unless obtaining the signature is impracticable)

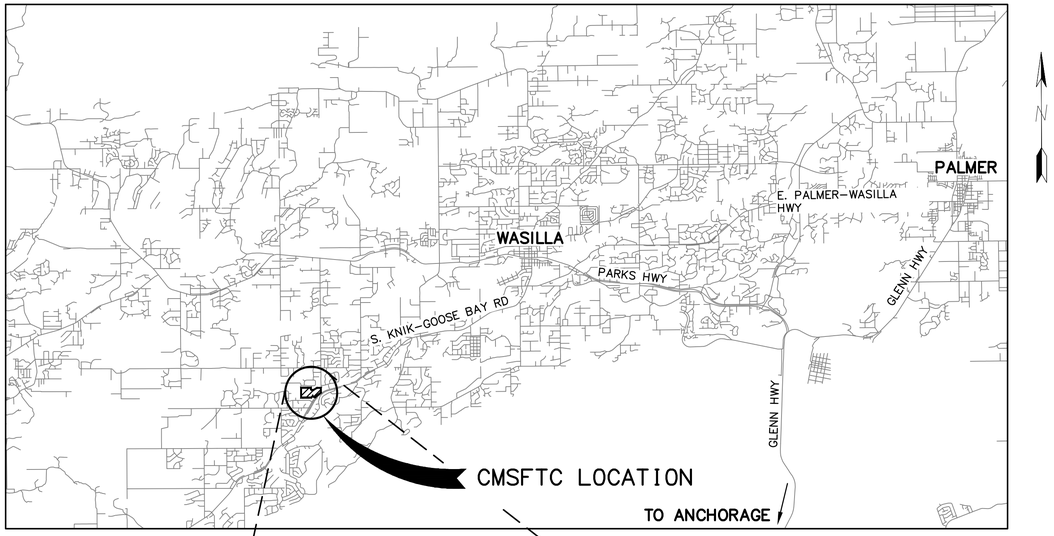
EXPLANATION OF PRELIMINARY AND APPROVED JURISDICTIONAL DETERMINATIONS: 1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time. 2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "preconstruction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

APPENDIX C

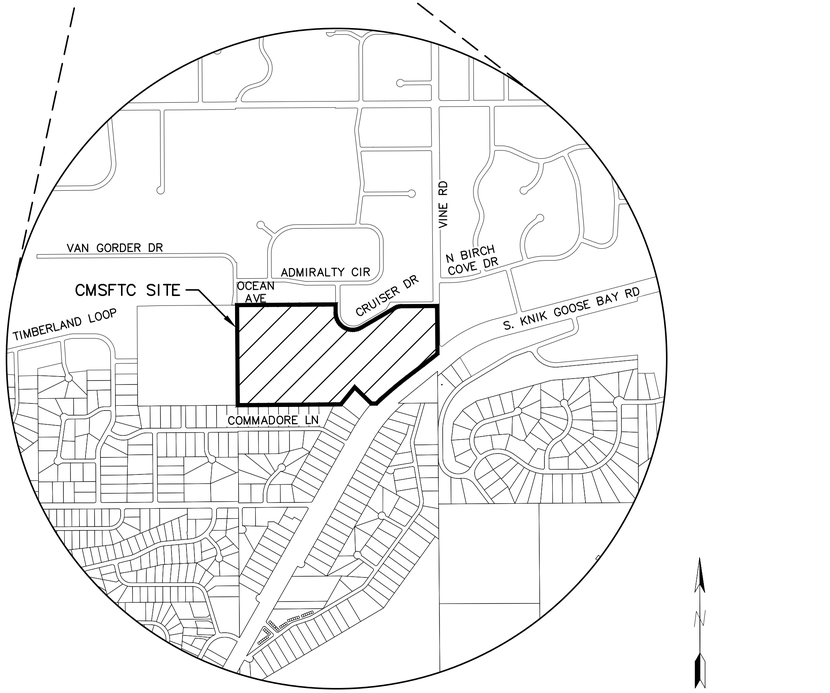
Exhibits

MATANUSKA-SUSITNA BOROUGH

CENTRAL MAT-SU FIRE TRAINING CENTER



SITE VICINITY MAP



SITE LOCATION MAP

MASTER PLAN EXHIBITS

SHEET LIST TABLE	
SHEET NUMBER	SHEET TITLE
1	COVER
2	EXISTING CONDITIONS WITH ORTHO PHOTO AND CONTOURS
3	EXISTING CONDITIONS WITH CONTOURS
4	EXISTING SITE UTILITY PLAN
5	CONCEPTUAL SITE PLAN WITH ORTHO PHOTO
6	CONCEPTUAL SITE PLAN WITH CONTOURS
7	CONCEPTUAL UTILITY PLAN

LEGEND

SYMBOL EXISTING (E)	SYMBOL PROPOSED (P)	
		PROPERTY LINE
		HOUSE OR STRUCTURE
123		CONTOUR LINE
S	S	SANITARY SEWER LINE
W	W	WATER LINE
		FIRE HYDRANT
		WATER VALVE BOX
G	G	GAS LINE
E	E	UNDERGROUND ELECTRIC LINE
OHE		OVERHEAD ELECTRIC LINE
T		UNDERGROUND TELEPHONE LINE
		FENCE
		WETLANDS

J:\jobsdata\20804.00 Msb Emergency Services Training Center\00 CADD\02 Figures\master Plan\20804.00 Master Plan - Cover Sheet.dwg Plot Date: 7/25/2016 4:38 PM

CRW ENGINEERING GROUP, LLC
3940 ARCTIC BLVD. SUITE 300
ANCHORAGE, ALASKA 99503
PHONE: (907) 562-3252
FAX: (907) 561-2273

MAT-SU BOROUGH
CAPITAL PROJECTS DEPARTMENT

CENTRAL MAT-SU FIRE TRAINING CENTER
MASTER PLAN

EXISTING CONDITIONS WITH ORTHO PHOTO AND CONTOURS

REV	DATE	DESCRIPTION	BY

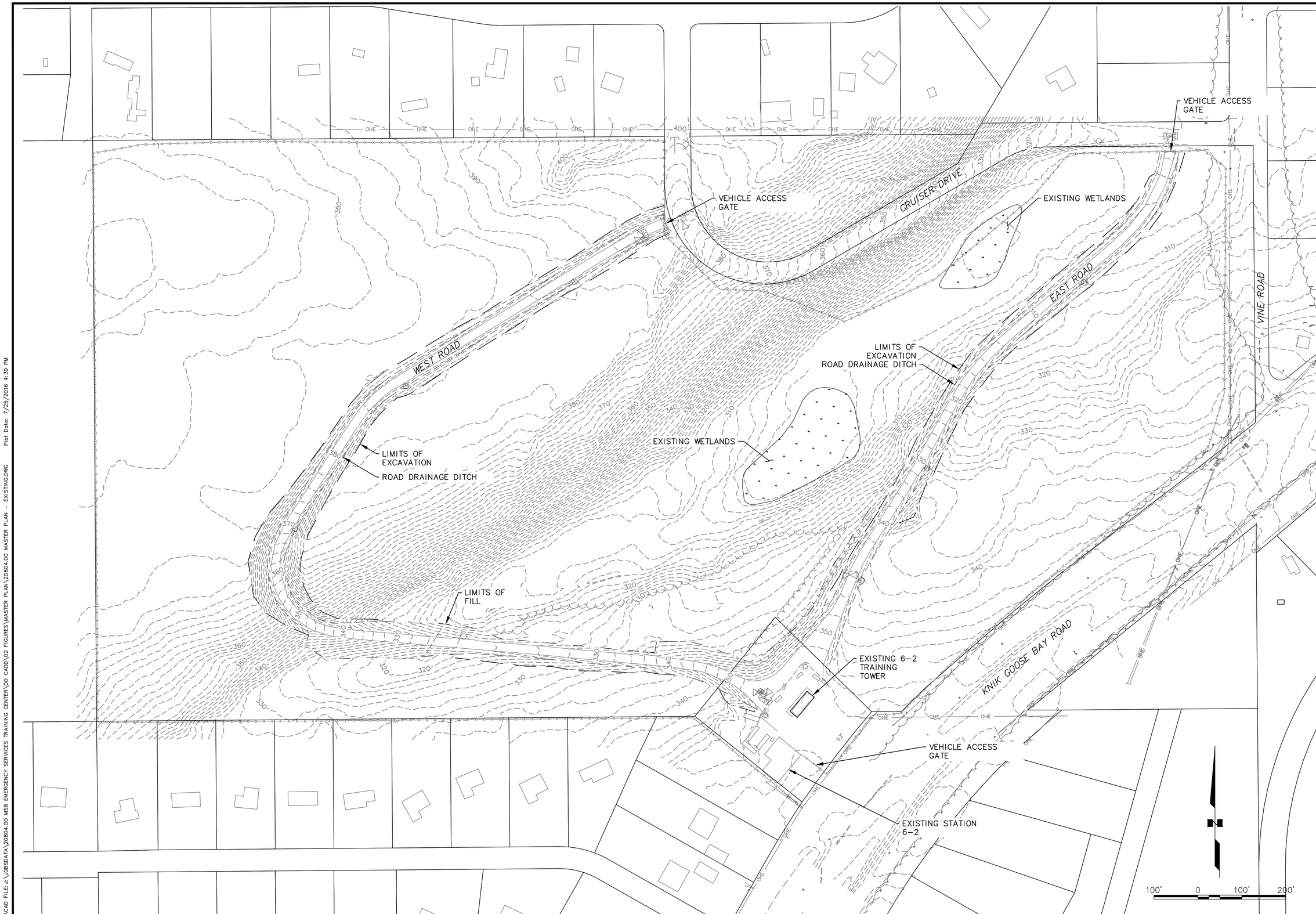
DATE: 7/26/2016

STATUS: FINAL

SCALE:
HORZ SCALE: 1"=100'
VERT SCALE: N/A

SHEET NO.
2

ACAD FILE: J:\JOBSDATA\20804.00 MSB EMERGENCY SERVICES TRAINING CENTER\09 CADD\02 FIGURES\MASTER PLAN\20804.00 MASTER PLAN - EXIST-ORTHO-CNTRS.DWG Plot Date: 7/25/2016 4:39 PM



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FAX: (907) 561-2273

MAT-SU BOROUGH
CAPITAL PROJECTS DEPARTMENT

CENTRAL MAT-SU FIRE TRAINING CENTER
MASTER PLAN

EXISTING CONDITIONS WITH CONTOURS

REV	DATE	DESCRIPTION	BY

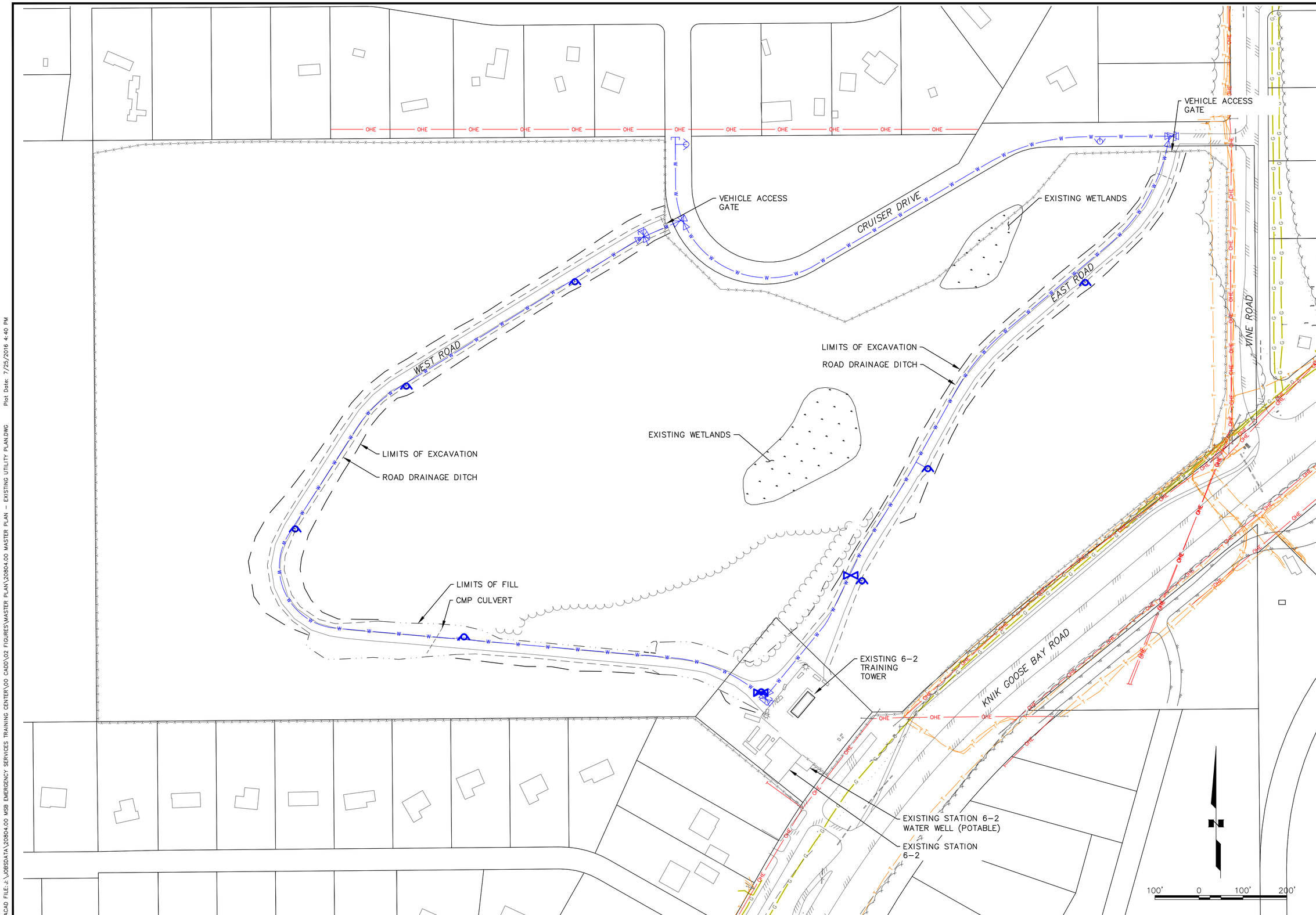
DATE: 7/26/2016

STATUS: FINAL

SCALE:
HORZ SCALE: 1"=100'
VERT SCALE: N/A

SHEET NO.
3

ACAD FILE: J:\JOBSDATA\20804.00 MSB EMERGENCY SERVICES TRAINING CENTER\00 CADD\02 FIGURES\MASTER PLAN\20804.00 MASTER PLAN - EXISTING.DWG Plot Date: 7/25/2016 4:39 PM



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MAT-SU BOROUGH
CAPITAL PROJECTS DEPARTMENT

CENTRAL MAT-SU FIRE TRAINING CENTER
MASTER PLAN

EXISTING SITE UTILITY PLAN

REV	DATE	DESCRIPTION	BY

DATE: 7/26/2016
STATUS: FINAL
SCALE:
HORZ SCALE: 1"=100'
VERT SCALE: N/A

SHEET NO.
4

ACAD FILE: J:\JOBSDATA\20804.00 MSB EMERGENCY SERVICES TRAINING CENTER\00 CADD\02 FIGURES\MASTER PLAN\20804.00 MASTER PLAN - EXISTING UTILITY PLAN.DWG Plot Date: 7/25/2016 4:40 PM

GENERAL NOTES

1. DRIVEWAY WIDTHS ARE 24' OR 26' WIDE.
2. PARKING STALLS ARE 10'X20'
3. 100' PERIMETER BUFFER IS THE EXISTING VEGETATION

LEGEND

- GRAVEL SURFACE
- ASPHALT PAVEMENT SURFACE
- FUTURE AREAS
- STRUCTURE OR BUILDING
- NATURAL GROUND OR GRASS
- CONCRETE PAD (30'x30')
- TRAILS
- TRAINING AREA DIVIDER

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MAT-SU BOROUGH
CAPITAL PROJECTS DEPARTMENT

CENTRAL MAT-SU FIRE TRAINING CENTER
MASTER PLAN

CONCEPTUAL SITE PLAN WITH ORTHO PHOTO

REV	DATE	DESCRIPTION	BY

DATE: 7/26/2016
STATUS: FINAL
SCALE:
HORZ SCALE: 1"=100'
VERT SCALE: N/A

SHEET NO.
5

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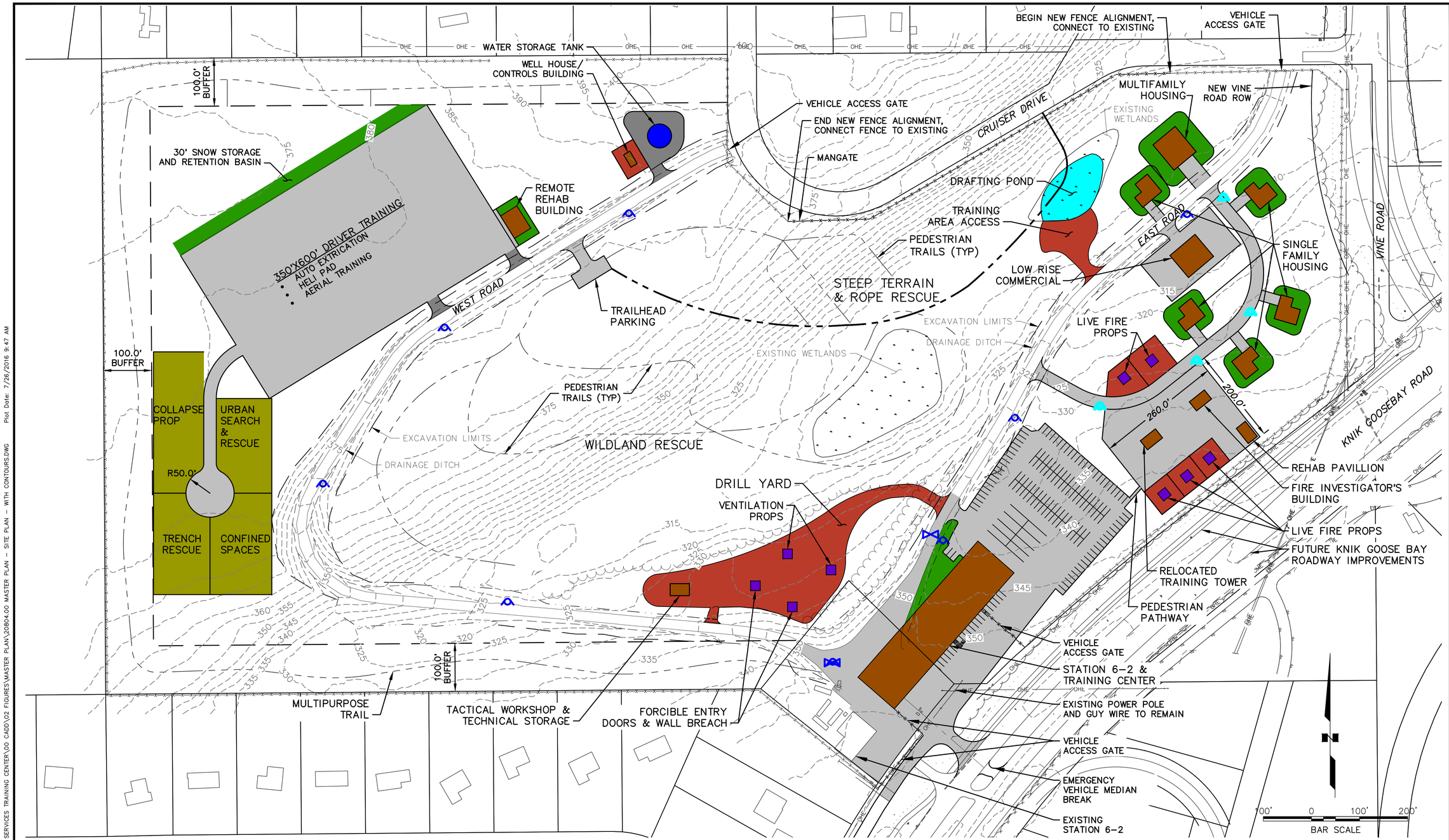

GENERAL NOTES

1. DRIVEWAY WIDTHS ARE 24' OR 26' WIDE.
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3. 100' PERIMETER BUFFER IS THE EXISTING VEGETATION

LEGEND

- GRAVEL SURFACE
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- FUTURE AREAS
- STRUCTURE OR BUILDING
- NATURAL GROUND OR GRASS
- CONCRETE PAD (30'x30')
- TRAILS
- TRAINING AREA DIVIDER

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MAT-SU BOROUGH
CAPITAL PROJECTS DEPARTMENT

CENTRAL MAT-SU FIRE TRAINING CENTER
MASTER PLAN

CONCEPTUAL SITE PLAN WITH CONTOURS

REV	DATE	DESCRIPTION	BY

DATE: 7/26/2016
STATUS: FINAL
SCALE:
HORZ SCALE: 1"=100'
VERT SCALE: N/A

SHEET NO.
6

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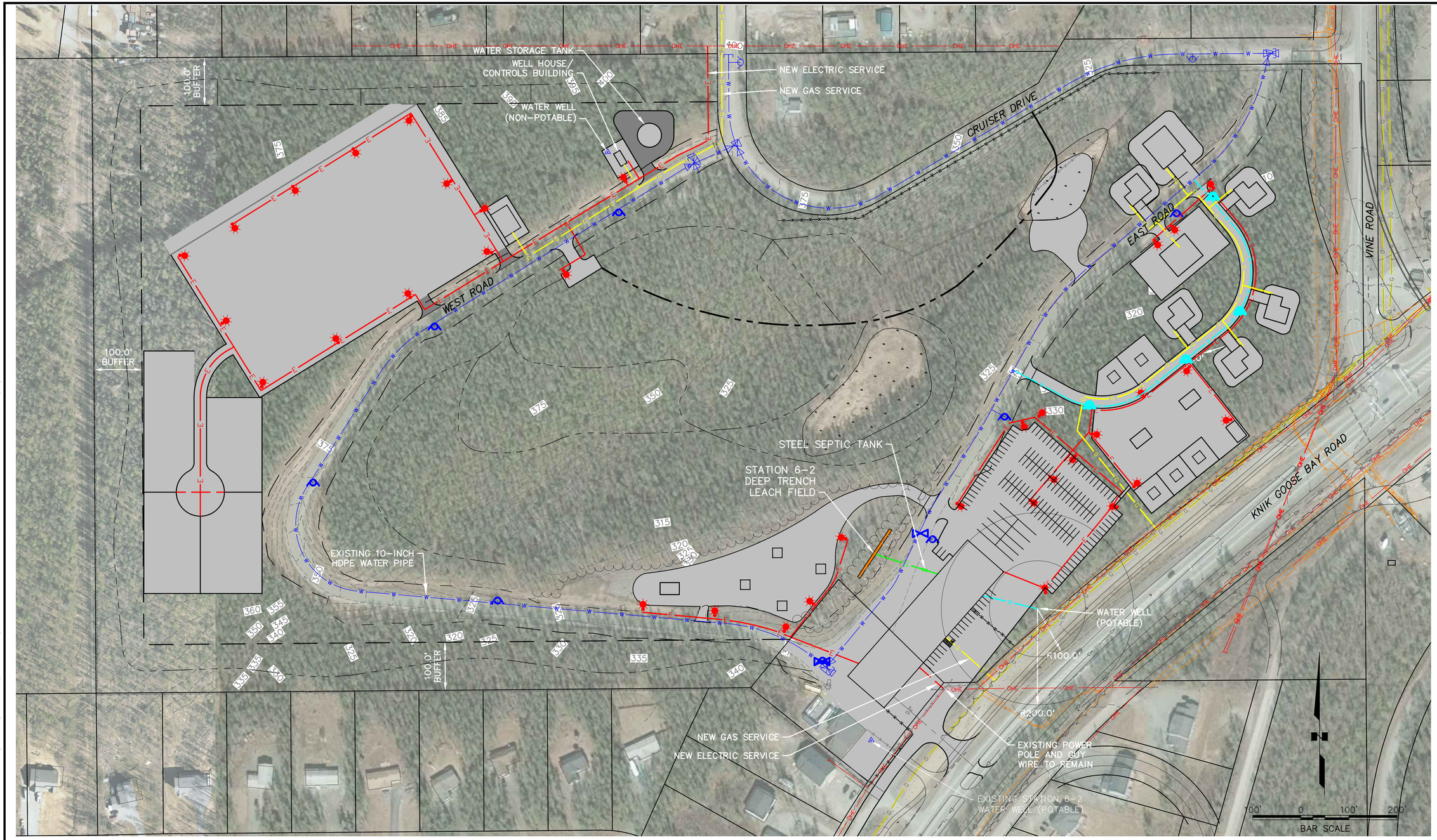

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MAT-SU BOROUGH
CAPITAL PROJECTS DEPARTMENT

CENTRAL MAT-SU FIRE TRAINING CENTER
MASTER PLAN

CONCEPTUAL UTILITY PLAN

REV	DATE	DESCRIPTION	BY

DATE: 7/26/2016

STATUS: FINAL

SCALE:
HORZ SCALE: 1"=100'
VERT SCALE: N/A

SHEET NO.
7

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