

SECTION 01 11 00
SUMMARY OF WORK

PART 1 - GENERAL

1.01 SUMMARY

- A. This section contains a general summary of work to be performed by the Contractor under this Contract. Final work will be determined during Design Validation and Conceptual Design based on financial and space allocation requirements and constraints.
- B. The Control Center, Training Facility shell structure, and selected site components will be completed through a separate contract. The disadvantageous procurement is for the remaining work for a fully functional facility.
- C. The Control Center and Training Facility will be a new facility located on CTA property at Pulaski Avenue and Lake Street, a portion of the West Shops Heavy Maintenance complex's storage yards.
- D. General Scope of Work: The Work to be performed includes, but is not limited to, the completion of the Training Facility office, construction of the Training Facility High Bay center, and expansion of site components. Work also includes providing components of the Control Center technology.

1.02 GENERAL REQUIREMENTS

- A. All Work must be performed in compliance with City of Chicago Building Code (CBC), City of Chicago Zoning Ordinances, CTA Infrastructure Design Criteria Manual (IDCM), applicable National Fire Protection Association (NFPA) requirements, and all other applicable regulations and requirements. CTA will furnish a complete listing of project requirements and guidelines to control the work.
- B. Work includes all design, permitting, and utility coordination necessary to complete the project. This includes, but is not limited to:
 - 1. City of Chicago Department of Buildings
 - 2. City of Chicago Planning and Development
 - 3. Chicago Fire Department
 - 4. Chicago Office of Underground Coordination
 - 5. Chicago Department of Transportation
 - 6. Chicago Mayor's Office for People with Disabilities
 - 7. Chicago Department of Water Management
 - 8. State Historic Preservation Office
 - 9. Municipal Utilities
 - 10. Private Utilities
- C. Work shall meet CTA standard design and construction requirements, including but not limited to:
 - 1. Manual of Procedures for Architectural & Engineering Services
 - 2. Infrastructure Design Criteria Manual
 - 3. Construction Safety Manual
 - 4. Quality Management System
 - 5. Safety and Security Management Plan

6. Safety and Security Certification Plan
 7. CTA Standard Specifications and Standard Drawings
- D. Construction work shall be compliant with all OSHA and CTA Safety Manual requirements. CTA reserves the right to oversee construction and all work must follow the requirements of the CTA Construction Safety Manual and CTA Standard Division 1 Specifications.

1.02 SCOPE OF WORK

- A. Site Work and Utility Connections: Work will extend and expand upon the basic infrastructure installed for the Control Center for the additional needs associated with the Training Facility. Work includes, but is not limited to:
1. Additional automotive parking facilities to support Training Facility employees and visitors.
 - a. Asphalt pavement over granular subbase with pavement markings.
 - b. Parking to meet City of Chicago landscape ordinance requirements and have site lighting per CTA requirements.
 - c. Accessible parking as required by ADA regulations.
 2. Sidewalks and landscaping around the Training Facility to provide walk paths to all entrances.
 - a. Sidewalks to be ADA accessible.
 - b. Landscaping to meet CTA requirements for maintainability and security.
 3. New approximately 1.5 acre concrete paved bus training area with mock bus stop and mock electric bus overhead pantograph charging station.
 - a. Heavy duty concrete pavement over granular subbase.
 - b. Adjacent area for parking for up to 10 buses.
 4. Two depressed concrete loading docks for deliveries of materials to the Training Facility High Bay. Site pavement will be expanded as required for the vehicular access to and around the Training Facility High Bay.
 - a. Docks to include dock bumpers, dock leveler, and seals.
 - b. One adjacent at-grade loading area / building entrance for other deliveries.
 - c. All main truck and site area pavement except automobile parking to be heavy duty concrete.
 5. Site drainage (catch basins, manholes) for increased pavement area and expansion of storm water detention / retention system.
 - a. All work to meet MWRD and City of Chicago DWM requirements for storm water management.
 6. Oil-water separator and sewage connections from Training Facility High Bay and Bus Training area.
 - a. Oil-water separator device to handle and treat all water from floor drains located within the Training Facility High Bay area and site collection basin located within the Bus Training Area.
 - b. Separator to be located for easy access for maintenance personnel for cleaning.

7. Storm water and septic sewer connections from the Training Facilities to the connections made for the Control Center.
 - a. Work may require offsite connections if determined to be necessary or advantageous.
 8. ComEd ductbank and transformer pads as determined necessary through ComEd coordination.
 - a. Facilities may share the Control Center ComEd primary feeds or may have a separate primary feed.
 9. Fiber optic ductbank(s) from CTA facilities on the Green Line and Pulaski Road.
 - a. Work includes installation of the ductbank and pulling of fiber optic cabling to terminations within the facility.
 10. Dialtone communications ductbank(s) from utility facilities on Pulaski Road to NetPop rooms within the Center.
- B. Training Center Office: Completion of any remaining exterior shell and all interior work, including systems, for the main training center building. Total office space needs are estimated at 36,000 square feet, excluding corridors, utility rooms, stairwells, and storage areas. Work includes, but is not limited to:
1. As required, completion of building structure and shell including foundations, floor slabs, structural steel, precast exterior walls, and membrane roof on steel deck. Portions of the work may be completed with the Control Center based on integration with the common core functions.
 2. Completion of all interior wall partitions, finishes, equipment, and specialty items for the following areas:
 - a. Training classrooms sized for 8 to 10 students with training tables, instructor lectern, display boards, projection and video capacity, and storage. Rooms to be acoustically isolated.
 - b. Training small conference rooms sized for 20 students with conference tables, instructor lectern, display boards, projection and video capacity, and storage. Rooms to be acoustically isolated.
 - c. Training large conference rooms sized for 40 or more students. Rooms to be divided by acoustic movable partitions to allow for larger training venues. Room to have conference / flexible furnishings and audio / video system for multimedia presentations.
 - d. Computer learning labs with 25 workstations, instructor lectern, display boards, project and video capacity, and storage.
 - e. Private offices for directors, senior managers, and managers with furnishings.
 - f. Open office cubicle area for support staff with individual workstations.
 - g. Media rooms with dedicated equipment for voiceover audio recording and training video development and editing.
 - h. Main copy center and mailroom for reproduction / training material assembly and mailboxes for all employees.
 - i. Library / study hall area for trainees to have access to training materials and research books with furnishings.
 - j. Electrical and communications support rooms as required by the equipment outlined below. Communications rooms to have static resistant flooring and be fully finished for dust control. Electrical and mechanical rooms may have sealed concrete and open structure ceilings.

- k. Any private toilet rooms separated from the common core locker and toilet facilities. Janitor's closets for cleaning may be required.
 - l. Interior stairwells for emergency egress and employee only usage. Stairwells to be fire-rated and exit directly to the exterior of the building. Stairwells must have an area of refuge per code. Re-entry into the building from a stairwell will be cardkey access controlled.
 - m. Finishes within the offices, conference rooms, training rooms, and training support rooms shall be high-grade durable carpet tile, painted gypsum board walls, and acoustic ceilings. All walls will be acoustically insulated and sealed tight to the structure above in conference and training rooms.
 - n. Finishes in any toilet rooms or janitor's closets will be ceramic tile flooring, water resistant gypsum board with ceramic tile to 7'-0" walls, and water resistant gypsum board ceilings.
3. Installation of all electrical systems:
- a. Switchgear, transformers, and main distribution panels for the 480/277V 3-phase electrical service received from ComEd. Room to have two exits with one exit having double doors and preference for exterior access.
 - b. Motor control centers / disconnects, panel boards and conduit / conductors for building lighting, receptacles, and hardwired equipment. Panel boards to be separated by usage. All conduit is to be concealed except utility rooms or other approved locations.
 - c. Regular and emergency egress lighting comprised of lay-in ceiling fixtures, surface mounted specialty fixtures, and wet location fixtures as required. Work includes installation of exterior light fixtures at building entrances and other security lighting. Exterior lighting to be controlled by photo-cell. Interior lighting to have occupancy sensors.
 - d. Alarm and control panel for all building alarms associated with electrical service disruption, fire protection, or other systems. Alarm panel will be tied into the main CTA SCADA system.
 - e. Connection into main building grounding system and lightning protection system.
4. Installation of HVAC systems:
- a. Roof top mounted HVAC units with supplemental electric resistance heating to account for all equipment, space conduction, and personnel loading.
 - b. Split-system air-cooled condensers to support communications rooms and other temperature critical equipment locations.
 - c. Entire building to be connected to a building automation system (BAS) to allow for local and remote monitoring and control of the mechanical / business systems and automatic system control sequence implementation in the event of a fire or other life safety event. Each occupied space will have an individual thermostat with controlled setpoints from the BAS system.
5. Installation of plumbing systems:
- a. As required by the building design, provide all fixtures including accessible fixtures as required. Provide floor drains in all toilet rooms and janitor's closets.
 - b. Provide all supply and waste piping, tying into the main Control Center domestic water entrance and sewage discharges. Provide electric water heaters as required. Water heaters may be tank or tankless depending on the water volume and usage.
 - c. Provide all storm water piping from the roof drain collection system to the main storm water detention system. All piping is to be accessible (not within masonry walls) and cannot run through electrical or communications rooms. Heat tracing will be required for any piping in unconditioned spaces.

6. Installation of communication systems:
 - a. Dialtone / NetPop connections to a punchdown panel for local distribution of dialtone service (primarily for fire control).
 - b. Main distribution frame system build-out to provide data connection servers and routers to CTA main enterprise systems. Work includes all racks, cable trays, power / grounding to support data network switches and patch panels. Backbone fiber optic cabling to the intermediate distribution frames for local distribution.
 - c. Intermediate distribution frames located within the training center for distribution of network throughout training classrooms, conference rooms, and offices. CAT-6A data cabling to be provided for premises cabling.
 - d. Access control systems for main training facility entry doors, stairway re-entry doors, and other locations as determined. The card key access will tie back to the enterprise system server for control and monitoring.
 - e. Video surveillance system comprised of cameras (dome and fixed) tied back to a local video recorder integrated with the enterprise video surveillance system. All entry points, corridors, training rooms, conference rooms, and building perimeter will be monitored.
 - f. Public address system with speakers tied back to a headend controller to distribute messages to all areas with zoning capabilities to limit distribution to selected areas if required.
 - g. Technology installations for all computer stations, video monitors, audio / video recording, projectors, and other similar components required for a fully functional training office and classroom spaces.
7. Installation of life safety systems:
 - a. In all office type spaces, wet pipe sprinkler system connected to the main Control Center fire water entrance. System to integrate with fire alarm control and CTA SCADA systems for monitoring.
 - b. In all electrical and communications spaces, double lock preaction sprinkler system with supervisory gas system and a clean agent system interlocked with the HVAC system.
 - c. Standpipe system with hose connections located within each stairwell for fire department use.
 - d. Fire extinguishers located per NFPA and CBC requirements with clean type in all communications rooms.
 - e. Addressable fire alarm and detection system per NFPA and CBC codes including FACP panel, annunciator panels, NAC / power supply panels, and addressable devices. System shall monitor the fire protection systems and tie into the BAS system for overall building control and monitoring during an event.
- C. Training Center High Bay Construction: Full construction of the facility including building foundations, structure, exterior walls, interior partitions, systems, and equipment. Estimated space needs are 60,000 SF.
 1. Building structure and shell including foundations, slab with depressed pits / equipment areas, structural steel, precast exterior walls, and membrane roof on steel deck. Structure to have a clear span for the entire building (no interior columns) and a minimum of 35' clear height to bottom of structure. Foundation and slab design will need to accommodate all embedded equipment / track, inspection pits, and loading for all vehicles and equipment using the space. Super structure design will need to accommodate all loading, including any loads from overhead cranes, electrical / compressed air distribution, mechanical equipment, or other business systems equipment.

2. Interior partitions to be of a durable material (glazed masonry or painted block) within all areas subject to maintenance type equipment and training. Floors shall be hardened, sealed concrete. Exposed painted structure ceilings.
3. Contractor to provide all equipment with the exception of the rail car simulators, contained space training module, fare collection equipment, and other items to be noted as relocated from existing facilities. Equipment may include bus / rail hoist systems, overhead cranes, mock customer assistant kiosks, or other similar equipment commonly built into CTA facilities.
4. The following general functional areas are to be included within the space. The work will include providing for all partitions, fencing / caging, foundations, embedded connections, and equipment to make the areas fully functional. The exact composition of the spaces and included equipment subject to revision based on budget and space constraints.
 - a. Rail Car Simulation Area: Enclosed area with foundations and electrical / data connections for installation of a rail car simulator (provided by CTA). Room shall have an adjacent instructor office and observation / training room. Two areas to be provided.
 - b. CSR Simulation Area: Open area with standard CA Kiosk and station area equipment (fare array, vending, barrier gates, etc) for training of customer service representatives. Provide kiosk, gates, and all foundations / connections for fare equipment by others.
 - c. OSHA Training Area: Open area for confined space, fall protection, and bucket truck / aerial lift training. Foundations and connections to be provided for equipment to be installed by others.
 - d. Bus Training Area: Open area for training on up to 6 buses, 40' and 60' in length. One inspection pit (sized for a 40' and 60' coach) with associated lighting, receptacles, and fall protection. Two lift bays with in-ground bus hoists set up for 40' buses and 60' buses. Two flat bays. An enclosed engine mockup room with overhead crane. An enclosed electric bus lab with benches and sufficient power supplies for electrical training and testing. Adjacent area for tire and other large component storage. Bus bays to be accessible to exterior.
 - e. Rail Training Area: Open area for a two car track with body post lifts and spin jacks. Track to be embedded rail within the floor slab with wheel stops / bumping posts on both ends. Adjacent area for storage and work on 4 truck assemblies and third rail mockups (subway and elevated).
 - f. Janitor / Warehouse Training: Open area with specialized floor surfaces for janitorial training. Mock warehouse facility with a minimum of two sets of shelving racks for forklift training. Warehouse facility to be used for general material storage and to be located with direct access to the loading dock area.
 - g. General Maintenance Training: Enclosed area for hot work training with hoods / exhausts for welding and similar training. Adjacent caged area for material storage and staging.
 - h. Loading Dock Area: Open area within the building to support two truck floor high docks and one at-grade dock. Adjacent storage and charging for forklifts and scissor lifts.
 - i. Locker Rooms / Toilet Rooms: Separate sex toilet and locker facilities to support the training areas.
 - j. Air Compressor Room: Enclosed room for air compressor / dryer to support distributed compressed air throughout the bus and training area.
 - k. Electrical Room: Enclosed room for electrical switchgear, motor control centers, and panel to all major equipment. Room to include the disconnects

- and gear to support 600V DC (fed from adjacent CTA substation) for rail car stinger system.
- I. Other offices or support spaces as determined during the final programming and layout of the facility.
5. Installation of electrical systems:
 - a. Main AC electrical switchgear to be combined with Training Office electrical systems. Provide separate panel boards and motor control centers for all high bay lighting, receptacles, and major equipment.
 - b. Suspended overhead reel electrical distribution throughout all open training areas. Receptacles at all exposed exterior columns and within all enclosed rooms.
 - c. LED high-bay lighting throughout all open training areas. Explosion proof LED sealed fixtures in the inspection pits. Standard lay-in or surface mount fixtures within all enclosed rooms.
 - d. 600V DC traction power distribution system including disconnects, cabling, grounding, and standard rail car "stinger" system. Traction power to be connected to adjacent CTA substation with associated disconnects and breakers. Traction power system to have a visual / audio alarm system to indicate when it is activated.
 - e. Space for future electric bus charging infrastructure.
 6. Installation of mechanical systems:
 - a. Roof top units for heating and make up air for the space. Additional heating to be provided by gas fired unit heaters and infrared unit heaters at all bay doors.
 - b. Ventilation through exhaust ducted to high and low spaces, controlled by a monitoring system. Dedicated bus vehicle exhaust systems to be provided at the bus bays. Destratification fans to be provided for air mixture.
 - c. Enclosed spaces to have split-system air conditioning or other method to provide for conditioned spaces.
 - d. All mechanical and business systems will connect to the BAS system. The Training Facility Office and High Bay shall utilize the same BAS system.
 7. Installation of plumbing systems:
 - a. As required by the building design, provide all fixtures including accessible fixtures as required. Provide floor drains in all toilet / locker rooms and janitor's closets.
 - b. Provide all supply and septic waste piping, tying into the main Control Center domestic water entrance and sewage discharges. Provide electric water heaters as required. Water heaters may be tank or tankless depending on the water volume and usage.
 - c. Provide all storm water piping from the roof drain collection system to the main storm water detention system. All piping is to be accessible (not within masonry walls) and cannot run through electrical or communications rooms. Heat tracing will be required for any piping in unconditioned spaces.
 - d. Provide trench drains and floor drains within the maintenance bays and inspection pits. All trench drains and floor drains must tie to the oil-water separator located onsite. All drain grates will be heavy duty.
 - e. All storm and sanitary piping to be cast iron with cleanouts located for proper rodding and maintenance of the system.
 8. Installation of communication systems:
 - a. Extension of the main distribution frame system to extend to additional intermediate distribution frames located within the High Bay space for

- distribution of network throughout training areas. CAT-6A data cabling to be provided for premises cabling.
 - b. Access control systems locations as determined. The card key access will tie back to the main Training Center enterprise system.
 - c. Video surveillance system comprised of cameras (dome and fixed) tied back to a local video recorder integrated with the enterprise video surveillance system. All entry points, corridors, training rooms, conference rooms, and building perimeter will be monitored.
 - d. Public address system with speakers tied back to the main Training Center headend controller to distribute messages to all areas with zoning capabilities to limit distribution to selected areas if required.
 - 9. Installation of life safety systems:
 - a. In the entire Training Facility High Bay, dry type sprinkler system tied back to the main fire suppression system for the Control Center and Training Facility office.
 - b. In all electrical and communications spaces, double lock preaction sprinkler system with supervisory gas system and a clean agent system interlocked with the HVAC system.
 - c. Fire extinguishers located per NFPA and CBC requirements with clean type in all communications rooms.
 - d. Addressable fire alarm and detection system per NFPA and CBC codes including FACP panel, annunciator panels, NAC / power supply panels, and addressable devices. System shall monitor the fire protection systems and tie into the BAS system for overall building control and monitoring during an event.
- D. Control Center Technology Provision and Installation: Completion of the technology equipment procurement, installation, and testing. Programming to be completed by CTA. Racks and backbone cabling to be provided within Control Center main construction.
 - 1. Terminations from and connections to CTA's main fiber optic communications backbone system with all components for a main core SONET node located within the facility. The system will have redundancy to the network through two physical locations.
 - 2. Installation of all servers and related hardware to relocate the main telephone Private Branch Exchange System (PBX) system which is an enterprise level IT telephony based system. The system will be the host for remote PBX's as major CTA facilities for centralized call processing.
 - 3. Direct view LCD modular panel video display system with front access for maintenance. Main panel display to be located within the theater space and be visible from all consoles. Secondary displays may be located within adjacent conference or situation rooms. Monitor panels shall connect to the main headend servers for display of operating control systems.
 - 4. Universal position consoles within the theater and situation room spaces able to be utilized by all CTA controller departments. Console equipment shall utilize a virtualized distributed architecture connected back to main server head ends. Equipment to include all monitors (multiple or single curved display) to allow for full display of all control screens and environments. All necessary peripheral hardware (keyboards, headsets, etc) for a full operating station.
 - 5. Head end servers and specialized equipment for bus/rail AVL software, systemwide public address systems, systemwide camera systems, SCADA, and

other main monitoring and control systems for the bus and rail network operations.

6. Bus / rail network radio systems including tower / antenna, simulcast control equipment, logging recorders, UPS / power back up systems, network management, and all other head end servers / devices. The radio system will need to integrate with the existing systems and be forward flexible to digital trunk technology.
7. Workstation terminal computers, monitors, and peripheral devices for the private offices and other workstations.
8. All cabling, conduit, supports, chaseways, and other items necessary to support the communications between the systems and devices that is not provided as part of the main building wiring.
9. Any other systems or communications equipment deemed necessary for a fully functional Control Center.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION