July 17, 2006

INVITATION TO BID

Sealed bids will be received by the City of Auburn, until 2:00 p.m. local time, on August 1, 2006 in the Office of the City Manager, 144 Tichenor Avenue, Auburn, Alabama, and at which time they will be publicly opened and read for furnishing the following:

Firefighting Simulation Building

Bid specifications are attached. The City is requesting bid prices on one (1) Firefighting Simulation Building. Please direct any questions to Larry Langley (334) 501-3160. Bids must be submitted on the attached form within a sealed envelope addressed:

City Manager, City of Auburn
144 Tichenor Avenue, Suite 1
Auburn, Alabama 36830

The envelope must be plainly marked on the outside as follows:

BID:	Firefighting Simulation Building
OPENING:	2:00 p.m., local time
DATE:	August 1, 2006

Guarantee will be required with each bid as follows: At least five percent (not to exceed $10,000) of the amount bid in the form of a certified or cashier's check or bid bond payable to the City of Auburn, Alabama. The bid bond is required on all projects that are $10,000 or more. Upon award, a Performance Bond and a Labor and Materials Bond in the amount of the contract price will be required. These bonds are also required on all projects that are $10,000 or more.

The successful low bidder is responsible for acquiring the appropriate business licenses and permits to conduct work with the City of Auburn, including a state license in accordance with Chapter 8, Title 34 of the Code of Alabama 1975. Any non-Alabama bidders must submit a written opinion from an attorney stating the amount, if any, of preference granted by law to businesses in his state of residence.

The award of the contract, if to be awarded, will be made within sixty (60) calendar days after opening of proposals to the lowest responsible bidder whose proposal complies with the requirements of the invitation to bid. Should no award be made within the sixty (60) days, all proposals will be rejected unless the successful bidder agrees in writing to a stipulated extension in the time limit for award. The successful bidder will be notified by letter, mailed to the address shown on his proposal, that his bid has been accepted and that he has been awarded the contract.

The City of Auburn believes fully in equal opportunity in the provision of supplies, equipment, construction and services. Positive steps should be taken to assure that small business, minority businesses and women's businesses are given many opportunities to provide the above-mentioned services when economically feasible. In the case of construction projects, the City of Auburn shall rely on individuals or firms seeking to do business with the City of Auburn to ensure that such above-mentioned businesses are given ample opportunity to participate on a sub-contractual basis.

The contractor agrees in all events to use in the project materials, supplies and products manufactured, mined, processed or otherwise produced in the United States or its territories if the same are available at reasonable prices. If the contractor determines that said items are not available at a reasonable price, he must first contact the City of Auburn and obtain approval for the use of other materials, supplies and products.

In the event a contractor violates the provisions of this section, the City may at its election, assess against the contractor liquidated damages in an amount of not less than two hundred dollars ($200.00) nor more than 20% of the gross amount of the contract, as deemed appropriate by the City.

The City of Auburn reserves the right, as the best interest of the city may require, to award the purchase contract from any of the bids, to reject any or all bids, and to waive any informalities in bids received. Bid will be good for sixty (60) days after being opened by the City of Auburn, Alabama. The City reserves the right to revert to the State of Alabama Contract if the bid price is higher than the contracted amount through the State.

The contractor will be required to provide certificates of insurance showing that it carries, or has in force, automobile liability insurance, general liability insurance, workers' compensation insurance and builders risk insurance. Limits of liability for automobile liability insurance shall be, at a minimum, $1,000,000.00 combined single limit. Limits of liability for general liability insurance shall be, at a minimum, $1,000,000.00 per occurrence, $1,000,000.00 personal and advertising injury, $1,000,000.00 general aggregate and $1,000,000.00 products/completed operations aggregate. General liability insurance will include coverage for contractually assumed liability. If general liability coverage is on a claims-made basis, the contractor will maintain coverage in force for a period of two (2) years following completion of the work specified in the agreement. Workers' compensation insurance shall provide statutory workers' compensation coverage and employers' liability coverage with limits of, at a minimum, $500,000.00 each accident, $500,000.00 disease- each employee and $500,000.00 accident, $500,000.00 disease – policy limit. Builder's risk insurance shall be on a completed value basis with a causes of loss-special form.

The certificate of insurance shall provide the City with thirty (30) days written notice of cancellation of any of the coverage named in said certificates. *The City of Auburn will be shown as additional insured under the contractor's general liability and automobile liability insurance policies for the work to be performed.*

The contractor shall require certificates of insurance from subcontractors. Subcontractors will carry limits of insurance equal to or greater than those carried by the contractor. These certificates shall be made available to the City before the Letter of Notice to Proceed is issued.

At the City's discretion, the contractor may be required to have in force higher limits than amounts mentioned above and/or broader coverage than normally carried by the contractor. Questions concerning insurance coverage may be directed to the Risk Manager, D'Arcy Wernette at 334.501.7243.

The successful bidder will note that the City pays by invoice on each Friday of the month. Invoices must be received by accounts payable at least seven working days before the scheduled check write. If you have any questions concerning billing, contact our accounts payable office at (334) 501-7238.

CITY OF AUBURN

Karen S. Broome
Purchasing Officer

Section 13144 – FIRE FIGHTING SIMULATOR

PART 1 – GENERAL

1.1 Work Included

A. The work under this section shall include the furnishing of all items shown as specified including:

1. Steel building system.
2. Prefabricated and custom metal stair systems.
3. Railing, anchors, supports, and other accessories.
4. Steel closures, doors, door hardware, and hollow metal door frames.
5. Burn room insulating system.

1.2 Definition

A. This simulator shall be used to provide training for firefighters in a controlled simulated environment, which is commensurate with actual fire conditions. These specifications shall be used in conjunction with the drawings for dimensions, features, and exact configuration of the training structure.

1.3 References

A. National Fire Protection Association (NFPA)

1. NFPA 1402 – Guide to Building Fire Training Centers
2. NFPA 1403 – Standard on Live Fire Training Evolutions

B. American Society for Testing and Materials (ASTM)

C. AWS D1.1 – Structural Welding Code – Steel

D. American Institute of Steel Construction (AISC), Manual of Steel Construction, latest edition

E. Occupational Safety and Health Standards (OSHA)

1. 29 CFR 1910.23 – Guarding Wall and Floor Openings
2. 29 CFR 1910.24 – Fixed Industrial Stairs
3. 29 CFR 1910.27 – Fixed Ladders

F. Steel Deck Institute (SDI), SDI 30 - Design Manual for Composite Decks, Form Decks, Roof Decks; Steel Deck Institute, Inc.

1.4 Design Requirements

A. Structural Requirements

1. Provide metal building system capable of withstanding the effects of gravity loads and the following loads & stresses within the limits and under conditions indicated.
    a. Live Loads:
        1) Floor: 100 PSF
        2) Attic: 100 PSF
        3) Flat Roof: 100 PSF
        4) Sloped/Gabled Roof: 100 PSF
    b. Wind Loads: [100 MPH] (local code)
    c. Wind Exposure: [B] (local code)
    d. Seismic Requirements: [B] (local code)
    e. Deflection Limits: Engineer primary & secondary framing components, floor systems, and roof and wall assemblies to withstand design loads with deflections no greater than 1/240 of the span.
    f. Exterior Wall Panel System:
        1) The building shall be capable of supporting a 1500 pound point load at any point on the exterior wall of the structure.
    g. Handrails and Guardrails:
        1) Uniform load of 50 lb/ft applied in any direction
        2) Concentrated load of 200 lbs applied in any direction
        3) Uniform and concentrated loads need not be assumed to act concurrently.

B. Code Requirements
    1. Structural design shall comply with the [2003 IBC Code].
    2. Safety design shall comply with applicable OSHA requirements.
    3. Training shall comply with applicable NFPA 1403 requirements.
    4. Due to the nature of the intended use, egress and fire code requirements are not expected to satisfy the code criteria for buildings intended to accommodate public occupancy.
        a. Local codes may require the simulator to have a variance due to the intended use and features unique to its application.
        b. It is the responsibility of the owner or owner's representative to determine the proper procedures and variances for their location and obtain the necessary variances or requirements.

1.5 Submittals

A. Shop Drawings

1. Submit steel building drawings showing structural panel layouts, structural frame layouts, joist layouts, locations of openings, building attachment details, and other details as may be required for a weather-tight installation.

    a. Furnish 5 sets of steel building shop drawings bearing the stamp and signature of a professional engineer registered in the state of Alabama.

2. Submit miscellaneous metal drawings showing stairs, railing, ladders, window closures, and any other shop fabricated items.

    a. Show member sizes, weld symbols, and attachment details.

    b. Furnish 5 sets of shop drawings with a letter of structural conformance bearing the stamp and signature of a professional engineer registered in the state of Alabama.

B. Calculations

1. Furnish 5 sets of steel building calculations bearing the stamp and signature of a professional engineer registered in the state of Alabama.

C. Burn Room Liner

1. Submit 2 sets of cut sheet information on the burn room liner.

2. Submit 2 sets of MSDS reports on all applicable materials to be used as burn room liner.

3. Submit 2 - 2”x2” samples of burn room liner material.

4. Submit 2 sets of burn room layout drawings including ceiling layouts, wall layouts, and any necessary details.

D. Doors, Frames, and Hardware

1. Submit 2 sets of cut sheet information on all applicable door, frame, and hardware information.

E. Miscellaneous Submittals

1. Submit 2 sets of cut sheet information on all applicable additional materials including rappelling anchors, shutter slam latches and handles, temperature sensing and indicating system, shingles, felt, plywood, color charts, and any other materials included as options.

1.6 Quality Assurance

A. Supplier shall have a minimum of 10 years experience in the design, engineering, and fabrication of fire training simulators and must offer these turn-key services to complete this section of work.

B. Erector shall be qualified by the supplier and have a minimum of 5 years experience installing pre-engineered metal building projects and a minimum of 5 completed projects of similar size and scope.

1.7 Delivery, Storage, and Handling

A. All components and accessories necessary for the assembly of the simulator including interior stairs, decks, and insulating material for burn rooms shall arrive at the project site by over-the-road trailer. Other small items including, fasteners, instruments, and instrumentation shall be delivered separately.

B. Store all building components according to building storage instructions above ground, separated, and protected from exposure to the elements & from physical damage caused by other activities.

C. During storage, space surfaces of materials to permit free circulation of air.

D. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 Warranty

A. Supplier shall provide a one (1) year warranty from the date of Substantial Completion warranting all components to be free from defects in materials and workmanship under normal use and service.

B. Supplier shall provide a five (5) year extended materials and workmanship warranty from the date of structure delivery warranting all components included in the "Steel Building System" to be free from defects in materials and workmanship under normal use and service.

C. Suppler shall provide a twenty (20) year extended life warranty from the date of structure delivery warranting all wall and roof panel paint finishes.

PART 2– PRODUCTS

2.1 Materials

1. Conform to applicable ASTM specifications.
2. Galvanize all structural and non-structural materials used, less than ¼" in thickness, whether or not exposed to the elements.

2.2 Fasteners

A. Provide pre-drilled/pre-punched holes prior to painting/galvanizing for bolted attachment of material during erection.

B. Field bolt wall panel system with 3/8" electro-galvanized, powder coated bolts at 6" on center.

C. Furnish wall panel system fasteners with a nylon washer to complete the weather-tight seal.

D. Provide fasteners of sufficient strength to support connected members and loads, and to develop full strength of parts fastened or connected.

E. Anchor bolts shall meet the diameter specified on the anchor bolt plan.

1. Anchor bolts are not included in this section.

2.3 Shop Finish Painting/Coating

A. Clean, prepare surfaces and shop prime structural steel except where members are zinc or aluminum-zinc alloy coated, or are to be incased in concrete.

B. Paint system for roof panel and wall panel steel exposed to the exterior. Factory electrostatic-applied polyester powder coating in accordance with manufacturer's standard procedures. Minimum dry film thickness 1.5 mils. Color to be Green.

C. Paint system for all window shutters, steel trim, headers, jambs, and sills exposed to the exterior. Factory electrostatic-applied polyester powder coating in accordance with manufacturer's standard procedures. Minimum dry film thickness 1.5 mils. Color to be Green.

D. Paint system for all protective ladder panels exposed to the exterior. Factory electrostatic-applied polyester powder coating in accordance with manufacturer's standard procedures. Minimum dry film thickness 1.5 mils. Color to be Green.

E. Paint system for all doors and door frames. Factory two-part epoxy finish in accordance with manufacturer's standard procedures. Minimum dry film thickness 1.2 mils. Color to be Green.

F. Shop finish for all stair stringers, stair rails, guardrail, bar grate treads, bar grate roof surfaces, steel balconies, steel landings, ladders, and rappelling anchors. Steel shall be hot-dipped galvanized to conform to ASTM A123 after drilling, punching, cutting, bending and welding.

G. Shop finish for all other miscellaneous items including but not limited to access hatches, studs, sheeting, hat channels, and decking. Steel shall be galvanized to conform to ASTM A123.

H. Factory finish for roof hatches. Roof hatches shall be provided with factory prime paint.

I. Factory treatment of burn room liner. Burn room liner shall be pre-treated with a two (2) part chemical system to be water resistant/repellent.

2.4 Standard Fire Fighting Simulator System

A. Weather Sealing

1. The footing channel for the building shall be placed over two sponge rubber strips, which shall seal the footing channel to the concrete foundation.

2. All exterior wall panels and vertical seams, which are metal-to-metal laps, shall be sealed with a continuous strip of sealer. The sealer shall not run, separate, or deteriorate with age.
3. All sealer shall be applied according to assembly drawings to form a weather tight structure.
4. The structural panel walls and structural panel roof system shall be weather tight upon completion.

B. Roof Systems

1. Structural Roof System
    a. The flat roof structure shall be a structural single panel roof system and shall consist of all metal panels, which are prefabricated, marked, and ready for assembly. The roof shall be constructed of not less than 13-gauge galvanized steel, roll formed into 7 1/2" deep compound corrugations, sealed with approved sealer, and connected together with 3/8" diameter bolts, spaced not more than 6" apart for a weather tight seal, which forms a continuous draining system. Splices shall be completely capable of developing the entire bending moment capability of the panel.
2. “Safe Deck” Roof System
    a. Flat roof surfaces designated as working decks shall be a galvanized bar grate system. When specified, 19W-4, 1” x 1/8” galvanized bar grate shall be provided with a 14-gauge galvanized support channel system and all required fasteners and anchoring devices. “Safe Deck” shall be applied over the structural panel system, which forms a continuous draining roof system.
3. Parapet Roof System
    a. Flat roof surfaces designated as a parapet roof shall be a concrete working deck. The decks shall be a composite metal deck designed for concrete fill. The deck shall be supported on 14-gauge minimum structural “C’s” placed 12” on center. The deck gauge shall be as designated by the deck manufacturer, G60 galvanized, to achieve the design loads. A minimum of 4” of concrete shall be installed over the deck to provide a smooth working surface. The concrete shall be reinforced with chopped strands of fiberglass to form a matrix to reinforce the concrete and protect from shrinkage and temperature cracking. The concrete shall be pitched toward roof scuppers though the parapet walls. The concrete mix design and installation is not covered in this section.
4. Gabled Roof System
    a. Gabled roof structures shall be constructed utilizing structural steel trusses, structural plywood deck, and composition shingle roof

covering. The composition shingles shall be 25-year single tab seal down as manufactured by Owens-Corning Fiberglas Corp., Tamko Roofing Products, Inc., Certain-Teed Corp., or similar quality shingles. The granular surface shall meet OSHA requirements for slip resistance. The deck shall be minimum ¾" nominal T & G plywood with exterior glued laminates. 15 lb. felt underlayment shall be installed on the deck. Roof chop-outs shall be replaceable and flush with roof to prevent a tripping hazard. Roof shall have minimum18-gauge painted fascia and soffit trim.

5. Sloped Roof System

    a. Single sloped roof structures shall be constructed utilizing 14-gauge minimum structural steel "C's" placed 12" on center, structural plywood deck, and composition shingle roof covering. The composition shingles shall be 25-year single tab seal down as manufactured by Owens-Corning Fiberglas Corp., Tamko Roofing Products, Inc., Certain-Teed Corp., or similar quality shingles. The granular surface shall meet OSHA requirements for slip resistance. The deck shall be minimum ¾" nominal T & G plywood with exterior glued laminates. 15 lb. felt underlayment shall be installed on the deck. Roof chop-outs shall be replaceable and flush with roof to prevent a tripping hazard. Roof shall have minimum 18-gauge painted fascia and soffit trim.

C. Wall Systems

1. The structural steel panel shall be G90 hot-dipped galvanized, painted one side, steel, and conforming to the appropriate ASTM specification. The panels shall be roll formed from flat steel and shall have a minimum corrugation depth of 4 1/2". Panels shall be joined at their seams, which shall lap a minimum of 1/2", and shall be held together with 3/8" bolts spaced not more than 6" center-to-center. All connection holes in the panels shall be pre-punched prior to painting. Self-tapping fasteners are not acceptable. The vertical seams shall be sealed with a sealer. The wall panels of the building shall have sufficient shear resisting capabilities to give the building structural stability when vertical and horizontal loads are applied.
2. Framing for load bearing walls shall be a minimum of 12-gauge, hot-dipped, G90 galvanized "C's" placed 3'-5" center-to-center or 3"x 4"x 1/4" prime painted structural tubing. All mounting plates at the bottom of each vertical shall be attached to the building foundation using the foundation anchor bolts.
3. Framing for interior non-load bearing walls shall be framed with 4 1/2", 18-gauge minimum, galvanized studs spaced a minimum of 24" on center. The face of the wall shall be minimum 18-gauge galvanized sheeting on both faces of wall to conceal stud framing.

D. Floor Systems

1. Floor shall be supported on structural "C's" placed 12" on center. The "C's" shall be a minimum of 14-gauge or heavier as designed by the building engineer. "C's" shall be a minimum of 10" in depth nominally and G90 hot-dipped galvanized. There shall be weeps in the bottom of the "C's" for drainage of water. Headroom shall not be reduced with the use of structural beams and shall have a minimum floor to ceiling height of 8'-9" across the entire floor area.

    a. All floor surfaces shall be a concrete working deck. The decks shall be a composite metal deck designed for concrete fill. The deck shall be supported on 14-gauge minimum structural "C's" placed 12" on center. The deck gauge shall be as designated by the deck manufacturer, G60 galvanized, to achieve the design loads. A minimum of 4" of concrete shall be installed over the deck to provide a smooth working surface. The concrete shall be reinforced with chopped strands of fiberglass to form a matrix to reinforce the concrete and protect from shrinkage and temperature cracking. The concrete shall be pitched toward doors and exterior walls. The concrete mix design and installation is not covered in this section.

E. Access Openings

1. Steel Doors

    a. Materials

        1) Sheets are to be made of commercial quality 18 gauge hot dipped zinc coated steel that complies with ASTM A924 A60.

        2) Vertical edges will join the face sheets by a continuous weld extending the full height of the door. Welds are to be ground, filled to make them invisible and provide a smooth flush surface.

        3) Hinge reinforcement to be not less than 7 gauge (3/16") plate 1-1/4" X 9".

        4) Reinforce tops and bottoms of all doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet. Doors with an inverted top channel shall have a steel closure channel screwed or welded in place so the web of the channel is flush with the top of the face sheets of the door. Plastic fillers are NOT acceptable. Seams around the perimeter of the top channel shall be caulked water tight with a paintable urethane caulk.

        5) Door Cores

            a) Insulated doors to have 20 gauge vertical steel stiffeners spanning the full thickness of the interior space between door faces. Stiffeners are spaced not more than 6" a part, and

attached by spot welds spaced not more than 5" on centers. Spaces between stiffeners are to be filled with fiberglass insulation (Min. density 0.8#/cubic ft.)

2. Steel Door Frames
    a. Materials
        1) To be 16 gauge hot dipped zinc coated steel that complies with ASTM designations A924 A60.
        2) All frames to be knock-down type and are to be assembled so that the face miter seam is "closed and tight".
        3) Hinge reinforcement to be not less than 7 gauge (3/16") plate 1-1/4" X 9".
        4) Anchors shall be tube and strap type. Vertical jambs shall be punched and dimpled to receive three 3/8" flat head machine screws (six per frame) of suitable length to accommodate the jamb profile and wall construction. Machine screws shall be fastened with 3/8" locking nuts to prevent jambs from working loose.
        5) Each framed opening shall be provided with drip lip header.
3. Door Hardware
    a. Door hinges conform to ANSI A8111
    b. Locksets conform to ANSI A156.2 Series 4000, Grade 2
        1) All locksets shall be keyed alike.
    c. Passage latches conform to ANSI A156.2 Series 4000, Grade 2
    d. Strikes conform to ANSI A156.2
    e. Dual adjustable ball catches conform to ANSI A156.2 B23013
    f. 4 ½" door pulls conform to ANSI A156.2
    g. Auxiliary Springs conform to ANSI K87454
    h. High-temperature door sweep supplied on all doors except control room doors and elevator shaft doors, if any, that do not rest on a stem wall.
4. Window Shutters
    a. All framed window openings shall receive 12-gauge hot-dipped galvanized coated steel, single leaf closure.
    b. Window closures shall be constructed with a recessed lip perimeter and welded construction. The windows shall be designed to provide an overlap to the interior or exterior to minimize outside light.

c. All shutters shall have an operating lever latch with handles on the inside and outside of the shutter. All shutters accessible from the ground shall have a key lock lever and shall be keyed alike.

d. All burn room shutters shall have 1" of Padgenite material and mounting channels in addition to the standard shutter including the operating lever latch.

e. Continuous stainless steel hinges shall be welded to the shutters and field-drilled for mounting.

f. Each framed opening shall be provided with drip lip header.

F. Stair Systems

1. Stringers shall be 1 ½" wide channel, minimum MC10x8.4. Drill all required holes prior to hot-dip galvanizing.

2. Stair top rails and midrails shall be minimum 1 ½"x 1 ½"x 11 gauge square tubing. Distance between rails shall be a maximum of 12". Rails shall be a three-line design and shall be a completely welded assembly welded to the posts with all welds ground smooth, prior to hot-dip galvanizing.

3. Stair end posts and intermediate posts shall be minimum 1 ½"x 1 ½"x 1/4" structural square tubing. Posts shall be a completely welded assembly welded to the stair stringer and rails with all welds ground smooth, prior to hot-dip galvanizing.

4. Stair treads shall be constructed of 19W-4, 1" x 3/16" bar grate, hot-dipped galvanized steel with checker plate nosing. Intermediate stair landings, where used, are to be identical to stair treads in design. The stair treads shall be bolted to the stringer to allow for ease of replacement of damaged treads.

G. Rail Systems

1. Top edge height of top rails shall be 42" plus or minus 3" above the walking/working level.

2. Top rails and midrails shall be minimum 1 ½"x 1 ½"x 11 gauge square tubing. Distance between rails shall be a maximum of 12". Rails shall be a three-line design and shall be a completely welded assembly welded to the posts with all welds ground smooth, prior to hot-dip galvanizing.

3. End posts and intermediate posts shall be minimum 1 ½"x 1 ½"x 1/4" structural square tubing. Posts shall be a completely welded assembly welded to the toe board and rails with all welds ground smooth, prior to hot-dip galvanizing.

4. Toe board and kick plates shall be structural steel angle 4" x 6" x ¼" welded to the railings prior to hot-dip galvanizing and bolted through the deck and structural "C's."

H. Burn Room Lining System

1. High temperature insulating panels and attachment materials shall be provided for the interior walls, ceiling, doors, and windows of the burn rooms as specified.
2. Panels in burn rooms shall be supported by a system of 18-gauge galvanized mounting channels mounted both horizontally and vertically and fastened to the building steel wall verticals using proper Tek screws. The horizontal mounting channels shall be 48” center-to-center and the vertical mounting channels shall be 24 inches center-to-center. Mounting channels shall be a nominal 6” in width and 1” in depth.
3. Panels shall be pre-cut to size and shall be 1" thick. Panels shall be pre-treated with a two part chemical system to be water resistant/repellent. Panels shall allow for live fires in temperature ranges of 1200 to 2000 degree F maximum depending on type of panel specified. Seams and joints shall be backed with 1” thick battens of similar material. Panels shall be fastened by 3” Tek screws with ¼” x 1 ¼” washers through oversized 5/16”diameter field drilled holes, six per 2’ x 4’ panel. Use of “speed clips,” insulating clips or building insulation washers is prohibited. Panels shall be installed with a ½” gap between panels and the panel perimeter shall be screwed to the channels. Fasteners shall be left with the washers being able to be turned with moderate pressure on the board.
4. Padgenite I insulating panels and accessories shall be capable of protecting the wall and ceiling surfaces of masonry, concrete or steel room, inclusive of windows, closures and doors from damage due to enclosed fires. Insulating materials shall be a minimum of: 1" thick, 46 PCF density, 800 PSI flex strength, possess a “K” factor of .81 or less at a mean temperature of 800 degrees F., and shall be capable of continuous service at temperature ranges to 1200 degrees F. Maximum temperature rating is 1800 degrees F. This maximum temperature is acceptable for a short period of time, but will decrease the panel’s life if repeated regularly. System shall withstand repeated exposure to heat and the application of water to heated surfaces without the breakdown of insulating properties. Insulating materials shall not require “drying out’ periods following the application of water nor be subject to “spalling” due to heat/moisture conditions. There shall be no restrictions placed upon use due to atmospheric conditions or ambient temperatures. There shall be no restrictions imposed upon the nature of the Class A fuel source, the fire location within neither the room nor any requirement of “special” precautions prior to ignition. A full set of engineered installation drawings shall be prepared by the panel supplier, which clearly shows the panel layout, sub-framing system and attachment layout. The contractor shall provide a sample of the material, written specifications, drawing showing a typical installation with hardware clearly shown, and a MSDS.

5. Accessories shall be furnished and installed for temperature sensing and indicating system and shall include two thermocouples for each burn room with high temperature wire to a pyrometer. A weatherproof box shall be mounted to building. One portable pyrometer for temperature monitoring (ranges of -199 to +1999 degree F with, LED display with battery power), a minimum of ten receptacles with male plugs, and a selector switch for ten circuit monitoring shall be included. Thermocouples shall be mounted at two different elevations within the burn rooms with wire from each run to box location. Boxes shall be mounted per the direction of the owner.
6. Complete layout drawings shall show all elevations, views, and details the location of the mounting channels, battens, and cut pieces of panels.

2.5 Building Description

A. The simulator consists of a structure which has out to out dimensions of approximately 15'-1" wide x 33'-0" long overall with varying roof heights. The simulator will have two sections; a 2-story tower and a one-story annex section. Each section will be outlined in this specification and the sections are referred to as Sections A and B. Section A is connected to section B. Each of these sections is outlined below.

1. Section A will be a two-story tower approximately 15'-1" W x 18’-6" L x 24'-0" H.
    a. Two (2) interior decks
    b. One (1) slopes roof with attic and perimeter welded guardrail.
    c. Two (2) 3’-0” chain gates, one (1) on each 18’-6” face of the tower
    d. Four (4) rappelling anchors on the roof
    e. One (1) 2'-6" x 3'-0" 12 gauge attic floor hatch
    f. One (1) vertical ladder from the 2nd floor up to the attic hatch
    g. One (1) two-story interior stair with welded stair railing
    h. One (1) two-story exterior stair up to a 10’ x 10’ platform with welded stair railing
    i. Two (2) 3' x 7’ exterior door with hollow metal door frame and hardware
    j. Three (3) 3' x 7’ interior burn room doors with hollow metal door frames and hardware
    k. Two (2) 3’ x 4’ window openings with latching shutters
    l. One (1) burn room protected with a Padgenite liner system on 2nd floor
2. Section B will be a one-story annex approximately 15'-1" W x 14'-6" L x 10'-0" H.
    a. Two (2) 3' x 4' framed window openings with latching shutters

b. One (1) 3' x 7' exterior burn room door with hollow metal frame and hardware

c. Entire room shall be protected with a Padgenite liner system

2.6 Additional Items

A. (none)

2.7 Items to be Included as Options

A. Burn room protected with a Padgenite liner system on 1st floor of Section A

B. 8-Panel search and rescue maze shall be installed having the ability to be changed and re-configured at the pleasure of the fire department. The system shall be constructed using a welded 1-1/2"x 1-1/2", 11 gauge tube steel frame with a 14 gauge HR panel skip welded in the center of the frame. The movable partitions shall have adjustable locking mechanism mounted on the top with a fixed foot mounted on the bottom. The partitions shall be held in place by a series of 2 inch by 2-inch 14 gauge "U" channels mounted on the underside of the floor joists approximately 12 inches on center covering a minimum area of 144 square feet. The adjustable locking mechanism shall mount in the channels and be held secure by tighten the foot of the mechanism in the track.

C. Two- story standpipe system shall be provided and installed in the building. A 4-inch riser with interior fire department hose valves at each floor and exterior double 2-1/2 inch Siamese F.D. connection with blind caps on the exterior of building is to be installed. The system shall be constructed from schedule 40 ASTM A-135 NHA Super Flo ASTM A703A-ERW 300 psi pipe. All threaded fittings shall be manufactured in accordance with ASME B16.4 (except plugs and bushings, ASME B16.14) and conform to Federal specifications, WW-P-501 (except plugs and bushings WW-P-471). Grooved fittings shall be used in areas where an easy method of changing direction, adding an outlet, or capping the grooved piping system is needed.

D. Power Jamb forcible entry door system mounted on one (1) door specified in section 2.6. Location shall be determined by owner.

E. Provide for 3rd floor on Section A. Design and construct the tower so that a 3rd floor can be added at a later date to be determined by the owner.

PART 3 – EXECUTION

3.1 Examination

A. Verify that concrete work has cured a minimum of 14 days. Verify that anchor bolts are at the proper spacing and protrude the proper amount above the concrete. Report any variances to the owner's representative prior to proceeding with erection.

1. Concrete stem wall elevation must be within tolerance of +/- ¼".

2. Anchor bolts placement must be within tolerance of +/- 1/8".

3.2 Installation

A. Comply with the respective manufacturer's recommendations for preparation of building components.

B. Comply with respective manufacturer's instructions and approved shop drawings.

3.3 Adjusting and Cleaning

A. Repair or replace damaged components.

B. Contractor shall properly maintain the site, collect all waste material, place all debris and waste in containers and remove from the site.