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FUNCTIONAL DESIGN CRITERIA, HAZARDOUS MATERIALS MANAGEMENT AND EMERGENCY RESPONSE (HAMMER) TRAINING CENTER		ECN No. 614636

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ENGINEERING CHANGE NOTICE

1. ECN 614636

Proj. ECN N/A

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.		4. Date
Supplemental [] Direct Revision [x] Change ECN [] Temporary [] Standby [] Supersedure [] Cancel/Void []	P.K. Sato, HAMMER Project, HO-57, 376-8184		December 21, 1994
	5. Project Title/No./Work Order No. HAMMER, 95L-EWT-100	6. Bldg./Sys./Fac. No. N/A	7. Impact Level ESQD
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[] Yes (fill out Blk. 11b) [X] No (NA Blks. 11b, 11c, 11d)	N/A	N/A Cog. Engineer Signature & Date	N/A Cog. Engineer Signature & Date

12. Description of Change

See ECN Continuation Page Number 3.

13a. Justification (mark one)

		Criteria Change	[]	Design Improvement	[x]	Environmental	[]
As-Found	[]	Facilitate Const.	[]	Const. Error/Omission	[]	Design Error/Omission	[]

13b. Justification Details

The revisions are made to the Functional Design Criteria for 1)incorporation of recommendations from the project Value Engineering session held August 8-12, 1994. 2) refinement or elimination of some functional requirements that were evaluated during conceptual design, 3) include updates to applicable codes, standards, DOE Orders and NEPA documentation to be implemented on the project, and 4) eliminate non-binding appendices A, B and C information which is all defined in conceptual design.

14. Distribution (include name, MSIN, and no. of copies)

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15. Design Verification Required	16. Cost Impact No Change to the Project Budget		17. Schedule Impact (days) None
	ENGINEERING	CONSTRUCTION	
[X] Yes	Additional [] $	Additional [] $	Improvement []
[] No	Savings [] $	Savings [] $	Delay []

18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

SDD/DD	[]	Seismic/Stress Analysis	[]	Tank Calibration Manual	[]
Functional Design Criteria	[]	Stress/Design Report	[]	Health Physics Procedure	[]
Operating Specification	[]	Interface Control Drawing	[]	Spares Multiple Unit Listing	[]
Criticality Specification	[]	Calibration Procedure	[]	Test Procedures/Specification	[]
Conceptual Design Report	[]	Installation Procedure	[]	Component Index	[]
Equipment Spec.	[]	Maintenance Procedure	[]	ASME Coded Item	[]
Const. Spec.	[]	Engineering Procedure	[]	Human Factor Consideration	[]
Procurement Spec.	[]	Operating Instruction	[]	Computer Software	[]
Vendor Information	[]	Operating Procedure	[]	Electric Circuit Schedule	[]
OM Manual	[]	Operational Safety Requirement	[]	ICRS Procedure	[]
FSAR/SAR	[]	IEFD Drawing	[]	Process Control Manual/Plan	[]
Safety Equipment List	[]	Cell Arrangement Drawing	[]	Process Flow Chart	[]
Radiation Work Permit	[]	Essential Material Specification	[]	Purchase Requisition	[]
Environmental Impact Statement	[]	Fac. Proc. Samp. Schedule	[]		[]
Environmental Report	[]	Inspection Plan	[]		[]
Environmental Permit	[]	Inventory Adjustment Request	[]		[]

19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision
N/A		

20. Approvals

	Signature	Date		Signature	Date
OPERATIONS AND ENGINEERING			ARCHITECT-ENGINEER	N/A	
Cog Engineer P.K. Sato	[signature]	12/21/94	PE		
Cog. Mgr. J.R. Kelly	JR Kelly	12/21/94	QA		
QA C.E. Norton	CE Norton	1-9-95	Safety		
Safety B.G. Baker	Bobby G. Baker	1/4/95	Design		
Security D. Todish	Denise M Todish	12/27/94	Environ.		
Environ. D.J. Carrell	[signature] for DJC	1/11/95	Other		
~~Projects~~/Programs P.J. Vandervert		[signature] 12/21/94			
Tank Waste Remediation System					
Facilities Operations			DEPARTMENT OF ENERGY		
Restoration & Remediation			Signature or Letter No.	9501072 (95-PMDA-033)	
Operations & Support Services					
IRM			ADDITIONAL		
Other		PKS ~~WR~~			
Fire Department W.R. Hayes		W R Hayes 12-27-94			
Site Training D.~~J~~. Donnelly		[signature] 12-21-94			
Emergency Preparedness M.E. Brown		[signature] 12-21-94			

A-7900-013-3 (06/92) GEF096

A direct revision change was made to document WHC-SD-T100-FDC-001, "Functional Design Criteria for the Hazardous Materials Management and Emergency Response Training Center," as summarized below.

A. Paragraphs listed below were revised to reflect the incorporation of recommendations from the Value Engineering Study held August 8-12, 1994 which are documented in the Team Feasibility Study dated October 1, 1994. The recommendations include combining functions for more cost effective and efficient use of facilities, better utilization of space for multiple activities, centralization of like functions, elimination of redundant space/facilities, consideration of landscaping on a budget basis, use pre-engineered building for the training support building, and the elimination facilities/utilities non-essential for training.

Paragraph 1.2.	Scope/Design Basis
Paragraph 4.1	Civil
Paragraph 4.1.2	Landscaping Development
Paragraph 4.1.5	Parking
Paragraph 4.1.6	Sidewalks
Paragraph 4.1.9	Transportation Props
Paragraph 4.1.9.1	Simulated Bridge Prop
Paragraph 4.1.9.2	Simulated Tunnel Props
Paragraph 4.1.15	Equipment Decontamination Pad
Paragraph 4.1.16	J-Box with Tank
Paragraph 4.2.1	Support/Administration Facilities
Paragraph 4.2.1.2	Multipurpose Laboratory
Paragraph 4.2.1.3	Change Room
Paragraph 4.2.2	Burn House
Paragraph 4.2.3	Garage and Storage Building
Paragraph 4.2.4	Chemical/Radiation Laboratory
Paragraph 4.2.5	Training Tower
Paragraph 4.2.6	Training Support Building
Paragraph 4.2.7	Observation Tower
Paragraph 4.2.9	Comfort Stations
Paragraph 4.2.10	Training Pads
Paragraph 4.2.10.7	The HAZMAT Spill/Leak Training Pad
Paragraph 4.3	Heating, Ventilating and Air Conditioning
Paragraph 4.4.3.2	Site Lighting
Paragraph 4.5.2	Other Communication Systems

B. Revised paragraph listed below to reflect functional need refinements that eliminated some functional requirements as identified during conceptual design.

Paragraph 3.2.	Piping and Vessels, Eliminated the need for storage of diesel and gasoline at the HAMMER SITE.
Paragraph 3.3.	General Chemical Processes, Eliminated the need for some chemical additives and filter backwash at the pond.
Paragraph 3.4.	Mechanical System, Eliminated the need for pumping return water from the props back to the pond.
Paragraph 4.4.1	Water, Paragraph 4.4.2 Sewage, Paragraph 4.4.3.1 Power, paragraphs changed to reflect current planning by the City of Richland for water and sewer line locations and confirmation that the City can accommodate the utility needs.

C. The paragraphs listed below were revised to update to current codes, standards, DOE orders and NEPA Documentation.

Paragraph 1.4	Site Location, corrected the DOE order number to RL4320.2C
Paragraph 5.1	Safety, Added DOE order 5480.9A "Construction Project Safety and Health Management."
Paragraph 5.2.1	Categorical Exclusion, revised to reflect that DOE has determined that the construction and operation of the facility is categorically excluded under DOE's NEPA regulations.
Paragraph 5.3	Safeguards and Security, Revised to update to current DOE orders.
Paragraph 6.1	Civil, item g - revised to current manual.
Paragraph 6.4	Mechanical Design, Item a and d, updated references to be current.
Paragraph 6.6	Item d, j, l, m and g, updated references to be current.

D. Deleted Appendix A, B and C.

RELEASE AUTHORIZATION

Document Number:	WHC-SD-T100-FDC-001, Rev. 1
Document Title:	FUNCTIONAL DESIGN CRITERIA, HAZARDOUS MATERIALS MANAGEMENT AND EMERGENCY RESPONSE (HAMMER) TRAINING CENTER
Release Date:	3/13/95

This document was reviewed following the procedures described in WHC-CM-3-4 and is:

APPROVED FOR PUBLIC RELEASE

WHC Information Release Administration Specialist:

Chris Willingham

C. Willingham 3/13/95

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SUPPORTING DOCUMENT	1. Total Pages 36

2. Title	3. Number	4. Rev No.
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5. Key Words	6. Author
HAMMER, Functional Design Criteria, FDC.	Name: P. K. Sato Signature Organization/Charge Code 0M200/H5DAB

7. Abstract

This document provides the functional design criteria for the Hazardous Materials Management and Emergency Response (HAMMER) Training Facility.

8. RELEASE STAMP

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FUNCTIONAL DESIGN CRITERIA

HAZARDOUS MATERIALS MANAGEMENT AND EMERGENCY RESPONSE (HAMMER) TRAINING CENTER

Revision 1
Issued by:
Westinghouse Hanford Company
December, 1994
for the
U.S. DEPARTMENT OF ENERGY
RICHLAND OPERATIONS OFFICE
RICHLAND, WASHINGTON

PROJECT NUMBER 95L-EWT-100

PREPARED BY:

Technical Manager — Date 12/16/94

Donna L. Stuit
Project Manager
U.S. Army Corps of Engineers — Date 12/20/94

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Environmental and Effluent Treatment Projects	12/21/94 Date	Site Training	12-21-94 Date
Quality Engineering Construction Projects	1/9/95 Date	W. R. Hays Hanford Fire Department	12-27-94 Date
C.W. Walter Safeguards and Security	12/27/94 Date	M.E. Borgeson HAMMER Projects	12-21-94 Date
S.R. Stelay Industrial Safety Programs	1/4/95 Date		
Don W. Fett for DJC Environmental/Policy	1/11/95 Date		

DEPARTMENT OF ENERGY APPROVAL:

J E Ceiler — 3/3/95

MASTER

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HAZARDOUS MATERIALS MANAGEMENT AND EMERGENCY RESPONSE (HAMMER) TRAINING CENTER

FUNCTIONAL DESIGN CRITERIA

1.0 INTRODUCTION

This document is intended as a presentation of the Functional Design Criteria for the Hazardous Materials Management Emergency Response(HAMMER) Training Center.

1.1 BACKGROUND

Within the United States, there are few hands-on training centers capable of providing integrated technical training within a practical application environment. Currently, there are no training facilities that offer both radioactive and chemical hazardous response training. There are no hands-on training centers that provide training for both hazardous material operations and emergency response that also operate as a partnership between organized labor, state agencies, tribes, and local emergency responders within the U.S. Department of Energy (DOE) complex.

Available facilities appear grossly inadequate for training the thousands of people at Hanford, and throughout the Pacific Northwest, who are required to qualify under nationally-mandated requirements. It is estimated that 4,000 workers at the Hanford Site alone need hands-on training. Throughout the Pacific Northwest, the potential target audience would be over 30,000 public sector emergency response personnel, as well as another 10,000 clean-up workers represented by organized labor.

The HAMMER Training Center will be an interagency-sponsored training center. It will be designed, built, and operated to ensure that clean-up workers, fire fighters, and public sector management and emergency response personnel are trained to handle accidental spills of hazardous materials. Training will cover wastes at clean-up sites, and in jurisdictions along the transportation corridors, to effectively protect human life, property, and the environment.

1.2 SCOPE/DESIGN BASIS

The HAMMER Training Center is to be located on the Hanford Site. It has a primary potential target audience of more than 40,000 public sector emergency responders, plus many private sector responders. The HAMMER Training Center will be an integrated hands-on training facility utilizing state-of-the-art techniques and realistic props. The HAMMER will offer both chemical and radioactive hazards handling and emergency response training for fire fighters, emergency managers, and other responder organizations located primarily within the States of Washington and Oregon. The training center will be located on an 80-acre site. Additional land will be reserved for future expansion. The HAMMER will have an administration and classroom building, burn house with computerized burn system, change room, emergency operations center (EOC), training support building, a number of large training pads for craft-specific and fire training, a manmade stream and pond, training tower, chemical/radiation laboratory, an above-ground pipeline, various transportation props, a remediation/characterization site, trench site, buried waste site, a junction/diversion box (J Box) with tank, and equipment decontamination facilities.

1.3 JUSTIFICATION

A feasibility study, conducted by Westinghouse Hanford Company, examined the overall feasibility for constructing and operating a HAMMER Training Center at DOE's Hanford Site. The study concluded that the proposed HAMMER Training Center is feasible. The feasibility study is discussed in detail in Supporting Document No. WHC-EP-0319, entitled *Hazardous Materials Management and Emergency Response (HAMMER) Training Center Feasibility Study*[1], dated March 1990. Additional assessments were conducted in the *Hazardous Materials and Emergency Response Training Center Needs Assessment*[2], dated September 1992.

1.4 SITE LOCATION

Site selection was determined per the requirements of DOE document RL 4320.2C, *Site Selection*. The site evaluation process used to select the HAMMER site is documented in Supporting Document No. WHC-SD-GN-SE-30003, entitled *Site Evaluation Report for the Hazardous Materials Management and Emergency Response (HAMMER) Training Center*[3].

The HAMMER Training Center site is located adjacent to the city limits of Richland, Washington; south of the Hanford Patrol Academy; and on the north side of Horn Rapids Road. The southern boundary of the site is located about 140 feet north of Horn Rapids Road, while the northern boundary is about 2,100 feet north of Horn Rapids Road. The western and eastern boundaries are located about 100 feet and 1,800 feet, respectively, from Hanford Patrol Academy Road. The HAMMER Training Center is located about 1.5 miles west of the 300 Area and 1 mile west of Siemens Power Corporation. The site is about 3 miles from the Columbia River, and is above the 100-year floodplain. The area that will be initially occupied by the HAMMER Training Center is 80 acres. A 40-acre expansion area located adjacent to the east site boundary will be reserved for future use.

2.0 PROJECT CRITERIA

This section addresses the general functional requirements, performance requirements, and design constraints for the project. The essential characteristics of the project will be defined.

2.1 DESIGN LIFE

The design life of this facility is 30 years. Equipment, instrumentation, and consumable components may have a design life of less than 30 years. If so, they will be designed to accommodate repair and/or replacement, and such design is economically justified.

2.2 NUMBER OF PERSONNEL

Preliminary estimates of HAMMER personnel requirements are summarized in appendix A, Staffing Requirements. The maximum population expected on the HAMMER Site is 184 personnel, including all staff, students, and visitors. The average population is expected to be 108 personnel.

2.3 OPERATING CONDITIONS

The Hammer facility will operate 12 months per year. Administrative hours will follow normal company working hours. Classroom and hands-on training will be offered in accordance with customer needs. Night and week-end training will be available on a scheduled basis. Janitorial/grounds, facility, and equipment maintenance activities are expected to be performed so as not to conflict with the training schedules.

2.4 EXTENT OF SERVICES PROVIDED

The HAMMER Training Center will provide a centralized location for providing training to hazardous material (HAZMAT) emergency response personnel.

Realistic field training, along with thorough and consistent classroom HAZMAT worker and operation response training, will be combined in the training center. The incident scenarios will include appropriate training props, hazardous materials transport and storage, equipment mockups, and emergency response equipment to simulate various potential incidents under varying conditions.

The services that the HAMMER Training Center will provide are described below:

a. Simulated flammable solids, liquids, and gases training facilities; and props for fire response training.

b. Radiological training props for handling radiological materials, including radiation storage and laboratory procedures.

c. Generic hazardous materials holding and transportation props (*i.e.*, petroleum tanks, tank trucks, rail cars, and pipelines) for emergency response to mock accidents and for leak containment exercises.

d. Spill containment simulation area for leak containment activities.

e. Laboratory emergency response.

f. Rescue training facilities for response to fires, HAZMAT transport vehicle accidents, and laboratory accidents.

g. Respiratory equipment training facilities.

h. Equipment and personnel decontamination facilities for procedural training.

i. Equipment familiarization and operation area.

k. Support facilities, including offices, classrooms, lavatories, cafeteria/ lunchroom, shower rooms, run-off containment and separation facilities, student and staff parking areas, and appropriate storage areas.

l. Confined space rescue techniques.

m. High- and low-angle rescue techniques.

n. Hands-on fire extinguisher training.

o. Fire department pumper testing.

2.5 FUNCTIONAL FLEXIBILITY

The HAMMER Training Center will be designed to provide maximum flexibility with respect to both operations and training. Administrative facilities will consider flexibility in expanding/rearranging office space, classrooms, *etc*. Training props will be designed to consider multiple training activities. The site access and utilities will consider future expansion of staff, as well as additional props for future site worker training needs.

3.0 PROCESS CRITERIA

3.1 INSTRUMENTATION AND CONTROL

Instrumentation and control systems will be required for the fire alarm and fire protection systems, the computerized burn system, the non-potable water distribution system (manmade pond and training prop water for fire fighting and spill simulation), lift stations (for both water and sanitary distribution), and liquid petroleum gas (LPG) and natural gas systems. Specific instrumentation and control requirements for these systems will be determined during the conceptual design.

3.2 PIPING AND VESSELS

Distribution systems for the water (domestic, irrigation, and fire), sewer, and gas will be required for the HAMMER Training Center. Fuel storage for diesel, gasoline, and LPG will also be required. Refer to paragraph 6.4, Mechanical Design, for the codes and standards that will be followed for the design of the distribution systems and fuel storage tank.

3.3 GENERAL CHEMICAL PROCESSES

Water treatment for algae control will be required in the manmade pond. The type and extent of this treatment will be determined during the conceptual design.

3.4 MECHANICAL SYSTEMS

Water for fire fighting training, the simulation of hazardous liquid leaks, and other training requirements will be distributed throughout the site via a closed recirculation system. This system will utilize the manmade pond as a storage reservoir, from which water for fire fighting and other training needs will be drawn. Drainage from these training activities will be collected and routed to the pond. Pond losses will be replenished from the domestic water system (refer to paragraph 4.4.1, Water).

4.0 FACILITY CRITERIA

This section discusses the design criteria that will be followed in preparing the HAMMER Training Center design.

The design of the HAMMER Training Center will be prepared in accordance with the U.S. Army Corps of Engineers (Corps) *Architectural and Engineering Instructions - Design Criteria*[4], appropriate national standards, selected DOE orders, and the Hanford Plant Standards. Refer to section 6 for a listing of the codes, orders, and standards that will be followed during design.

The Americans with Disabilities Act also applies to the design of this facility. The design agency will interpret the extent of application to the design of this facility, and document any decision for exclusion.

4.1 CIVIL

This section discusses the civil design features and function of HAMMER. It includes the general site design requirements, including site layout, landscaping, site security, service roads, parking, and storm drainage.

Several of the training center props associated with civil design are also discussed. These include the manmade stream and pond, rail road tank car with rails, buried and above-ground tanks, well-sampling stations, the characterization/remediation site, the trench site, the buried simulated waste site, and the J-Box with tanks.

4.1.1 Site Development

The intent of the HAMMER site design will be to provide a "campus-like" setting. Facilities serving similar functions will be combined to reduce cost and provide the most effective use of the HAMMER complex. Earthwork will consider material balance to the greatest extent practical. Paved walkways will be designed to provide access to the parking areas and various training props from the administrative building, by both students and maintenance vehicles. Training props that provide similar training activities will be clustered so that utility services can be combined wherever possible. Perimeter access will be provided for surveillance, maintenance, and access by training vehicles. Future expansion will be considered in the design of access and utilities.

4.1.2 Landscape Development

Plants will be used to create outdoor spaces for climate control, screens, buffers, and aesthetics for facility staff, students, and visitors. Plants will be arranged to create a natural looking environment. Trees, shrubs, and groundcover will be established around the administration building and fringe areas. Lawn areas will be held to a minimum, being confined to the grass around the administration building, comfort station, and training support building. Native and dry land grasses will be seeded in all other areas, for both restoration and erosion control. Plant material selection will be based on low-maintenance native plants of the Hanford, Washington, environment.

4.1.3 Physical Security and Safeguards

A chain-link fence, with a minimum height of 7 feet, will be constructed on the project perimeter, except at locations where unobtrusive fencing is installed. Gates will secure all access roads into the facility.

Unobtrusive fencing, with a minimum height of 7 feet, will be installed along the south and west sides of the site (adjacent to Horn Rapids Road and Hanford Patrol Academy Road) in order to provide a pleasing entrance to the HAMMER site.

4.1.4 Service Roads

Service Roads will be designed in accordance with the U.S. Army Corps of Engineers' Engineering Manual (EM) 1110-2-410, *Design of Recreation - Access and Circulation*, and the Washington State Department of Transportation Design Manual.

Vehicular access will be provided to all site facilities. Two-way service roads accessing training center props and facilities will be a minimum of 24 feet wide, and provide a minimum overhead clearance of 14 feet. All service roads will have an all-weather surface, and will be designed to support the imposed loads of fire apparatus.

Turn-around or staging areas will also be provided in the vicinity of the training props.

4.1.5 Parking

Onsite parking will be provided in the vicinity of the administrative building and the training support building, for both students and staff. Student parking will be separate from administrative staff parking. The student parking area at the administrative building will be designed for 100 spaces, with additional provision made for overflow parking to accommodate 50 to 75 additional vehicles. Administrative staff parking will be designed for 40 spaces. Parking at the training support building will be 50 spaces. Parking areas will be designed in accordance with the Corps EM 110-2-410, *Design of Recreation - Access and Circulation*, and the Americans with Disability Act (ADA) *Accessibility Guidelines for Buildings and Facilities*.

4.1.6 Sidewalks

Sidewalks will be constructed wherever necessary to provide access for pedestrians throughout the HAMMER Training Center. Sidewalks from parking areas, around the administration building, and adjacent to buildings, will be reinforced concrete construction;

and will have features and dimensions in accordance with ADA. Asphaltic concrete or reinforced concrete paved paths (6 feet wide) will be constructed from the administration building to the various training props and buildings in order to provide access for both pedestrians and small utility vehicles.

4.1.7 Storm Drainage

Storm collection systems will be designed in accordance with the American Society of Civil Engineers Manual in Engineering Practice No. 37, *Design and Construction of Sanitary and Storm Sewers*. Storm drainage systems will be designed to accommodate a 25-year, 6-hour storm.

Site grading will be designed so that overland flow can occur without damage to facilities.

4.1.8 Manmade Stream and Pond

A manmade stream and pond will be constructed near the administration building. The primary function of the pond will be to provide water storage for use during peak fire fighting training exercises. The pond will be designed to give a natural appearance that blends with the adjacent landscape. Bank and pond bottom slopes will be designed to prevent erosion. One access ramp into the pond will be provided for pond maintenance. This ramp may also be used for boat access in the simulated spill containment training. Ramp design will be consistent with the guidance presented in EM 1110-2-410, *Design of Recreation Areas and Facilities-Access and Circulation*. The pond bottom will be designed to accommodate maintenance equipment. The design will allow for the complete drainage of the pond for maintenance or repairs. Consideration will also be given to the need for applying chemicals for algae and weed control.

The design of the stream will consider simulated spill containment training under streamflow conditions. The stream will be designed to provide a natural appearance, and will be constructed of erosion-resistant materials. Stream flows will consist of water recirculated from the pond.

4.1.9 Transportation Props (DELETED).

4.1.9.1 Simulated Bridge Prop (DELETED).

4.1.9.2 Simulated Tunnel Prop (DELETED).

4.1.9.3 Railroad Tank Cars with Rail. The function of the railroad tank cars and rail is to simulate railroad accidents with HAZMAT transport rail cars for spill containment training. This prop will consist of one set of rails, a minimum of 200 feet in length, and designed in accordance with the *Manual for Railway Engineering* (AREA). A steep downslope will be provided on one side of the rail. This prop will include one pressurized tank car and one non-pressurized tank car, either in new or used condition. Tank car leakage will be simulated by using water or other non-hazardous liquids.

4.1.10 The Buried and Above Ground Tanks Prop

This prop will consist of one above ground and one underground fuel storage tank. Their function will consider training on underground storage tank location, hydrocarbon fuel retrieval excavation (simulated with water), dismantling, and removal exercises. The above ground tank will be designed for training on hydrocarbon fuel removal (simulated with water) and leakage control. Access to this prop by excavation equipment (*i.e.*, back hoe, crane, dump truck, *etc.*) will be required.

4.1.11 Well Sampling Stations

The function of the well sampling stations will be to allow for environmental sampling training using a mobile sampling truck. Each well will simulate a typical monitoring well; and will consist of a small buried storage reservoir, riser pipe, and locked well cap. The wells will be located around the characterization/remediation site so that training exercises involving plume modeling can be accomplished in addition to standard sampling techniques.

4.1.12 Characterization/Remediation Site

A 4-acre area will be needed for training exercises involving hazard characterization and remediation of a contaminated site. The size of the area will consider independent characterization and remediation training activities occurring at the same time. Access by excavation equipment, drill rigs, dump trucks, cranes, and other similar equipment will be considered in the design. Soil sampling, chemical/radiation monitoring, *etc.*, is also expected to occur at this site. An equipment staging area will also be provided.

4.1.13 Trench Site

The trench site will generally be designed to simulate a liquid disposal crib of the kind typically used at the Hanford site. Its function will include training for low-angle rescue operations, drum recovery, crib remediation, and other similar activities. Access by excavation equipment, drill rigs, dump trucks, cranes, and other similar equipment will be considered in the design. An equipment staging area will also be provided.

4.1.14 Buried Simulated Wastes

A 4-acre area will be needed for training exercises involving the hazard characterization and remediation of a waste burial ground. The function of this area will consider geotechnical exploration techniques (*i.e.*, the use of ground penetrating radar; drilling and test pit excavation; and trench excavation techniques, including trench shoring, tunneling, and dust control; and the removal of buried solid wastes, including debris, drums, pipelines, and large wood, concrete, and metal boxes. Simulated wastes will be buried in several configurations that represent those commonly found at Hanford. Specific activities will involve both manual and remotely-controlled equipment. An equipment access and staging area will also be included at this site.

4.1.15 Equipment Decontamination Pad (DELETED).

4.1.16 The J-Box with Tank

The J-Box prop will be designed to recreate the type of liquid transfer switching station encountered within tank farms. A typical J-box has a series of lines that can be interconnected, using jumper lines for liquid transfers between tanks. The box is typically covered with concrete blocks that require a crane and riggers for removal. Activities such as jumper change or head tightening could be scheduled at this prop. Typically, this would involve the use of a remotely-controlled, electric-impact wrench that is positioned by the crane operator and actuated by the tank farm operator.

The tank will consist of simulating a double shell tank of the sort typically found at the Hanford Site. The simulation will include a buried support slab (with riser pipes, valves, pumps, wiring, and instrumentation, *etc.*) extending above grade to give the appearance of the typical tank farm tank. The simulation should consider sampling activities, *etc.*, that may require small underground water storage reservoirs (*e.g.*, septic tank). Tank core sampling will also be desired, and this will require a small simulated-sludge storage reservoir.

4.1.17 Fire Pumper Test Pit

The function of the pumper test pit will be to accommodate fire department pumpers so that two suction hoses can be used when drafting. The pumper test pit can be incorporated as part of the manmade pond.

4.1.18 Emergency Response Vehicle Staging Area

A staging area for emergency vehicles will be required. This area will be paved with an all-weather surface. The staging area will be sized to accommodate maneuvering and positioning of a full complement of emergency vehicles.

4.2 ARCHITECTURAL AND STRUCTURAL

This section presents the architectural and structural design criteria that will be used in preparing the architectural and structural design of the training facility. The buildings and concrete pads that comprise the HAMMER Training Center are discussed, along with the various codes and standards that will be followed in the design of these facilities.

4.2.1 Support/Administrative Facilities

Facilities serving similar functions should be combined to reduce cost and provide the most effective use of the HAMMER complex. The combination of facilities and props for the most efficient and cost effective use, will be established during the design process.

4.2.1.1 Administration/Classrooms. This building will house the administrative functions necessary to support the operation of the HAMMER Training Center. The building will provide necessary student training space (*e.g.*, classrooms), both male and female restrooms, a lunchroom/cafeteria, and student break areas. The administration offices include office spaces for registration, clerical, and other training program administrative functions. The building also includes office space for the training facility management and staff, instructor offices, and storage space for office supplies and educational equipment.

Classrooms will be designed to allow the greatest flexibility for setting up the room for various classes. They will be designed to accommodate 20 students. All rooms should be set up in a standard arrangement. One classroom should be designed for computer based training. Adequate space and utilities for 16 computers should be provided in this classroom.

The lunchroom/cafeteria should be designed for meal preparation and service for up to 150 people. Kitchen facilities must include, but not be limited to, refrigeration, ovens, dry storage cabinets, sinks, food preparation counters, wash down capability, *etc.*

Office space will consider both arrangement flexibility and the future expansion of the administrative staff.

4.2.1.2 Multipurpose Laboratory (DELETED).

4.2.1.3 Change Room. The change room is combined into the training support building. The change room will provide space for instructors and students to change into, and out of, personal protective clothing; and perform decontamination functions. The layout of the room varies depending on the particular scenario involved. The room provides the necessary space for students to change into personal protective suits and clothing, and perform personnel decontamination. It also contains men's and women's restrooms and showers, as well as storage space for hazard personal protective suits and clothing, supplies, and educational equipment.

4.2.1.4 The EOC. The purpose of the EOC is to provide a training environment where students can obtain practical experience in the operation of an EOC, as well as gain incident command training during a simulated HAZMAT emergency for offsite students. The facility serves a dual purpose. It functions both as a classroom and an EOC. It includes a main conference room that can accommodate 40 to 60 people; and is equipped with tables, chairs, telephones, and workstations. The wall space is designed for showing vital information. A smaller room, adjacent to the conference room, is equipped as a communication center.

This room contains a base station radio, a telephone switchboard, TV/VCR equipment, and computers.

4.2.2 Burn House with Simulated Burn System

This facility will consists of a 2 1/2-story concrete building designed to provide realistic fire fighting training for structural fires. Single family dwelling rooms on both the first and second floors will be burn rooms capable of withstanding high temperatures (1,000 degrees Fahrenheit for steel liner plates and 600 degrees Fahrenheit for wall surfaces). One room on the ground floor will be a sealed room, and will be equipped with a standard sprinkler and fire alarm system panel box. The peaked roof of the building will provide training for roof ladders. Fire simulation will be provided by a computer controlled propane or natural gas fire system.

4.2.3 Garage and Storage Building

The garage and storage building is combined into the training support building. The garage and storage building will combine the storage of fire fighting equipment with that of training materials, supplies, and equipment required to support the high level of field training envisioned for the higher case scenarios. The building will require heating for foam storage, as well as separation from other facilities for storage of flammable materials.

Storage bays for one HAZMAT vehicle, one fire truck, and an ambulance will be provided in the garage portion of the building. Additional space for indoor training activities will be provided, including bleacher-type seating.

4.2.4 Chemical/Radiation Laboratory

The Chemical/Radiation Laboratory will provide unique training for HAZMAT emergency response personnel to accidents in a laboratory setting. Mock accidents (*i.e.*, chemical spills, and vapor releases using simulated hazardous substances) are expected to occur at this prop. The Chemical/Radiation Laboratory will be combined into the training tower and will represent a realistic mockup of a chemical and radiation laboratory. It will include laboratory equipment, fume hoods, containers and glassware, Bunsen burners, laboratory tables, glove boxes, and various containers labeled with simulated hazardous substances.

4.2.5 Training Tower

The training tower will be a 6-story structure that provides realistic fire fighting training for structural fires. Ladder exercises, repelling, and high-angle rescue training will be performed at this prop. The training tower will be constructed separate from the burn building. Exterior stairs will be constructed from ground level, and will extend to the tower roof. The stairs will be a minimum of 60 inches wide, with landings provided at each floor.

Floors 3 through 6 of the tower will contain a hallway, with a minimum of 3 rooms with doors. The first two floors will include the Chemical/Radiation Laboratory space. A Self Contained Breathing Apparatus (SCBA) Search and Rescue building will be constructed adjacent to the tower. This structure will be equipped with a sound system, television monitors, and infra-red cameras similar in design to the Hanford Fire Department SCBA Trailer. A SCBA maintenance facility, separate from the training tower, will be needed for SCBA maintenance and storage. This facility will include a compressor, work bench, spare air cylinder storage, and a small heated space for drip-drying equipment and harnesses after decontamination.

4.2.6 Training Support Building

The training support building is needed to store training materials, supplies, and the large and heavy equipment required to support training exercises. Space will also be provided for indoor training activities during inclement weather, and for craft-specific training activities (*i.e.*, scaffolding erection, overhead duct work, and piping *etc.*), and for mock-up of craft-specific props (*i.e.*, confined space, *etc.*). This building will be equipped with restrooms and a small break area. A loading dock for training and truck unloading will also be needed. The garage and storage building, SCBA maintenance, change rooms, SCBA compressor fill stations and mask cleaning are combined into the training support building.

4.2.7 Observation Tower (DELETED).

4.2.8 Group Shelters

The group shelters will consist of a concrete slab and a post-and-beam roof system. The slab will be sized to accommodate six 6-person picnic tables, with adequate circulation between tables.

4.2.9 Comfort Stations

Restrooms and comfort stations will be located so that service is provided within a maximum 600-foot radius from any point on the HAMMER site. Restrooms will be provided in the administration building and the training support building. The need for restrooms in other buildings will be evaluated during the conceptual design. Separate comfort stations will be located on the HAMMER facility grounds so that the minimum radius requirement is met. All restrooms and comfort stations will be furnished with hot and cold running water, and flush toilets.

4.2.10 Training Pads

All training pads will be of reinforced concrete with a drainage system to collect water for recycling. Props with fire simulation will have fire hydrants located on two sides of the pad as well as remote shut-off switches for the props. All pads will be designed to accommodate a minimum of an AASHTO HS-20 axle load. Pads where burn activities will occur will be designed to withstand temperatures of up to 1,800 degrees Fahrenheit.

4.2.10.1 Flammable Liquids Burn Pad. This pad will be used for flammable liquids fire fighting practice. A burn pit will be constructed in the pad that can be filled with water. Gas piping, valves, and nozzles will be designed to operate so that, when burning, they will simulate a flammable liquid. Either propane or natural gas will be used to accomplish the fire simulation.

4.2.10.2 The LPG Burn Pad. The LPG burn pad will be used for LPG fire fighting practice. An LPG tank will be situated on the edge of the pad. The tank will be plumbed to a "Christmas-tree" type burn nozzle and LPG tank arrangement. The LPG tank arrangement will be used to simulate a burning propane tank with flame impingement to the liquid and/or vapor spaces with a manually-controlled gas jet to simulate relief valve operation. Adherence to the requirements of NFPA 58, *Storage and Handling of Liquid Petroleum Gas*, is required.

4.2.10.3 Drum and Cylinder Pad. The drum and cylinder pad will be used to simulate an open storage area for a number of 55-gallon drums, several 150- to 250-pound pressurized tanks, and some 1-ton cylinders. This prop will be used to train personnel in the techniques of patching, plugging, and transferring materials from leaking containers.

4.2.10.4 Tank Truck Pad. This pad will be used to simulate a tanker truck rollover. The pad will be designed to accommodate three tanker trailers simultaneously. Tankers will be equipped with Interstate Commerce Commission (ICC) valving. Water will be used to simulate leakage. Fire simulation will also be needed at this prop, so natural gas or propane service will be required.

4.2.10.5 Railroad Tank Car Pad. The railroad tank car pad will be used for simulating three different types of railroad tanker spills. Water will be used to simulate leaks. Carriers will be complete with normal valving. Other features for training purposes include carbon dioxide (for vapor cloud) and fire simulation.

4.2.10.6 Hot Waste Pad. This pad will be used for training on the proper handling of radioactive wastes. Simulated means will be used in place of actual radioactive materials for training exercises.

4.2.10.7 The HAZMAT Spill/Leak Training Pad. This pad will be used to train for the cleaning of HAZMAT spills and leaks. The pad provides enough space to simulate cold, warm, and hot zones, as well as decontamination areas. The drum and cylinder pad (paragraph 4.2.10.3) and hot waste pad (paragraph 4.2.10.6) are combined with this pad.

4.2.10.8 The 90-Day Storage Pad. The function of this pad will be to simulate a 90-day storage area for hazardous waste containers. It will be used for instructing students in the methods of management, monitoring, taking inventory, and handling and segregating stored materials. The pad will require a roof structure, and will be enclosed on three sides with a chain-link, gated front. A perimeter curb will also be required.

4.2.10.9 Confined Space/Fall Protection Apparatus. A structure will be provided to simulate confined space, as well as for training fall protection methods. An existing structure will be considered for this prop. This prop will require a compacted gravel area.

4.2.10.10 Above-Ground Pipeline Pad. This pad includes equipment to simulate a leak in an above-ground pressurized pipe or to simulate a petroleum pipeline rupture. The material in the pipe will be water under pressure used to simulate HAZMAT leaks.

4.2.11 Architectural Codes and Standards

The architectural codes and standards that will be followed in the architectural design of the project facilities are outlined in paragraph 6.2, Architectural.

4.2.12 Structural Design Codes and Standards

All structural designs will be based upon accepted engineering practices and, in general, will conform to the engineer manuals listed in paragraph 6.3, Design Manuals. Site-specific design criteria design loads will be in accordance with the criteria defined in paragraph 5.4, Natural Forces.

4.3 HEATING, VENTILATING, AND AIR CONDITIONING

The administration building complex (including the administration/classroom and EOC), the training support building, comfort stations, and control rooms in the search and rescue prop and burn house will be provided with HVAC. The type of HVAC systems used at these locations will be evaluated, using life-cycle cost analysis, during the conceptual design.

4.3.1 Design Data

The design parameters that will be used for the HVAC system design will be in accordance with Hanford Standard Design Criteria 5.1, *Standard Design Criteria for Heating, Ventilating, and Air Conditioning*.

4.3.2 Design Codes and Standards

The codes and standards that will be followed in the design preparation for the HVAC systems are outlined in paragraph 6.4, Mechanical Design.

4.4 UTILITIES

This section assesses the utility requirements for raw water, potable water, process water, cooling water, irrigation water, electrical power, and sewage disposal in terms of available capacity and tie-in points. Freeze protection will be considered where appropriate.

4.4.1 Water

Potable water for the HAMMER Training Center will be obtained either from a drilled well, by connection to the City of Richland's water supply, or a combination thereof. Life-cycle cost for options will be evaluated. The non-potable water used for training exercises and irrigation will be obtained either from the potable water source or from the manmade pond.

The City of Richland plans to deliver potable water to a new line to be installed by the City along Kingsgate Way and extending to Horn Rapids Road. The connection point is located on the south side of Horn Rapids Road, about 1,200 feet from the HAMMER site connection point. The City has indicated that this pipeline can meet the potable water demand, as well as be used to replenish the pond during non-peak periods. This requires the construction of a pipeline extending from the HAMMER Site, and connection to the City of Richland's pipeline.

Coordination with the City of Richland, Utilities and Physical Services Department, will be required if connection to the City's water supply is selected. The training center's potable and non-potable water demand (quantity and pressure) will govern the water supply design requirements. These parameters were finalized during the conceptual design. An agreement for connecting to the City's water supply system is being negotiated.

4.4.2 Sewage

Sewage disposal will be accomplished by connecting to the City of Richland's disposal system. The City of Richland plans to install a new sewer line along Kingsgate Way extending to Horn Rapids Road, approximately 1,200 feet from the HAMMER connection point. The City has indicated this pipeline can meet the sanitary wastewater flow from HAMMER. Disposal to the City requires installing approximately 1,200 feet of pipe from the HAMMER connection point to Kingsgate Way. An agreement to connect to the City's sanitary wastewater disposal system is being negotiated.

Based on the estimated HAMMER administrative staff, students, and visitors; the disposal system is expected to be sized for anywhere between 3,500 and 14,500 gallons per day. Accordingly, Washington State Department of Health rules will be followed (WAC 246-272).

Sanitary waste drain field(s) will be located in accordance with the Washington State Department of Health's *Onsite Sewage System Regulations Minimum Horizontal Separations*.

4.4.3 Electrical

4.4.3.1 Power

a. Primary power will be provided by the City of Richland at 12,470 volts, 3-phase. The service extension will be run from an existing feeder, with a proposed termination adjacent to the pump house/filter house buildings.

b. The primary power will terminate in a line-up of medium voltage switch gear that will provide electrical distribution for the HAMMER Facility. The switch gear will consist of two independent sections: one for normal electrical service, and one for emergency electrical service. The need for emergency power will be evaluated during the conceptual design.

c. Distribution of the electrical service will be through an underground system consisting of ducts and manholes. Electrical cables will be run in separate ducts for the normal and emergency systems. Branching of electrical service to the various structures onsite will be achieved using pad-mounted, ground-level, primary voltage switches. Primary voltage switches will be selected to accomplish the desired switching with minimal interruption to the rest of the distribution system.

d. Secondary power will be supplied to the personnel and equipment buildings at 277/480-volt, 3-phase, 4-wire, through pad-mounted transformers located adjacent to the building. The need for revenue or energy consumption metering will be evaluated during the conceptual design.

e. Secondary power will also be supplied to the site training facilities at 277/480-volt, 3-phase, 4-wire, through pad-mounted transformers. It is anticipated that several site facilities can be served via a centrally-located line of 480-volt switch gear. Low-voltage power will be provided, as required.

f. At locations where electrical distribution system sectionalizing or pickup is required, gang-operated, load-break switches will be provided.

g. New permanent transformers will be totally enclosed, pad-mounted units.

h. Wind-loading will be in accordance with American National Standards Institute C2, grade 8 construction. All equipment will be protected from, or resistant to, environmental conditions that would cause damage to it or its operation. Local conditions may include humidity from 5 to 100 percent, ambient temperatures from -30 degrees Fahrenheit to + 115 degrees Fahrenheit, lightning, blowing dust, rain, or snow.

i. All vehicle and personnel gates in substation fences will be bonded to the substation ground mat using flexible braided conductors.

4.4.3.2 Site Lighting.

a. Area lighting shall be provided for all onsite parking areas and pathways. Lighting shall be designed in accordance with the IES Lighting Handbook for open parking areas and DOE Order 6430.1A, *General Design Criteria.* The administration building parking area and entrance walkways shall be illuminated to meet the IES guidance for pedestrian security. Lighting for the footpaths, and all other parking areas shall be designed to meet the IES for pedestrian safety.

b. Illumination of the HAMMER facility props will be necessary in order to accommodate training during non-daylight hours. Lighting for the training props shall be designed to meet IES Illuminance Category B, simple orientation for short temporary visits.

4.5 COMMUNICATION SYSTEMS

4.5.1 Telephone

Telephone service will be provided to the site by either the local serving utility or by extending the existing Hanford telephone system to the site. The telephone service will terminate at the administration building and will be distributed throughout the site as dictated by the design. The telephone system will utilize an underground duct bank/manhole system similar to the electrical service.

4.5.2 Other Communication Systems

A communication system capable of receiving "Distant Learning" from Tulane and Xavier Universities and other academic and training institutions will be provided. The requirement for telecommunication of fire and security alarms or other data systems, as well as integration with other existing networks, will be determined during the conceptual design.

4.6 AUTOMATIC DATA PROCESSING

The extent of automatic data processing (ADP) will include personal computers (PC's) connected to the Hanford Local Area Network (HLAN) in the administrative offices and the EOC. Stand-alone PC's that can access hazardous material databases will also be required in the EOC and one classroom.

4.7 ENERGY CONSERVATION

Systems provided will comply with energy conservation requirements. System design will be justified by life-cycle cost analysis, as defined in DOE Order 6430.1A, sections 110-12. Energy conservation reports will be provided as required.

4.8 MAINTENANCE

The systems designs will provide adequate access to the systems and installed equipment to permit routine testing, maintenance, repair, and replacement. The design will provide for the safety of maintenance and operations personnel. The systems and equipment will be designed or selected to perform their respective functions with minimum maintenance. Components of the systems will be selected to maximize interchangeability. Special tools for servicing and maintaining the systems will be provided by the project. Operations and maintenance manuals, drawings, and data (including as-built dimensions and recommended spare parts lists) will be provided. Design and construction must ensure that construction and operational tests are scheduled and coordinated during the construction and testing phases of the project.

5.0 GENERAL REQUIREMENTS

5.1 SAFETY

The facilities constructed under this project are non-nuclear. Division 13 of DOE Order 6430.1A does not apply to any facility constructed as part of this project.

All design features and construction activities will be in accordance with the U.S. Army Corps of Engineers' EM 385-1-1, *Safety and Health Requirements Manual.* Safety and health reviews performed during all phases of this project will reduce or eliminate known and potential hazards in accordance with standards mandated by DOE Order 5480.4, *Environmental Protection, Safety and Health Protection Standards.* The DOE Order 5480.9A, *Construction Project Safety and Health Management*, will be implemented on this project.

The design will consider the limitations of the project equipment related to fire, explosion, hazardous materials, and industrial safety (including hazards from the proposed project). The design should consider the requirements of 29 Code of Federal Regulations (CFR) 1926, *Safety and Health Regulation for Construction.*

5.1.1 Criticality - Not Applicable

5.1.2 Safety Analysis

This project is designated as a General Use Facility. Formal safety analysis and evaluation is not required. Safety reviews performed during the normal planning, design, and execution of the project will mitigate identified hazards associated with construction and subsequent operations.

Safety classifications of Westinghouse Hanford Company (WHC) systems, components, and structures are as identified and defined in the Westinghouse document, WHC-CM-1-3, MRP 5.46, *Management Requirements and Procedures Manual.* The WHC Safety Class 3 is the highest classification anticipated for any system or component in this project. The failure of equipment and systems provided by this project would not adversely effect the environment or safety and health of the public, or groups of personnel within the 600 Area and/or the Hanford Site boundaries. This project is not within the analyzed bounds of an applicable Safety Analysis Report (SAR), since none is required for these types of systems.

5.1.3 Contamination Control

No radioactive contamination is expected at this site. Contamination risks from other sources are expected to be relatively low. Existing work procedures will be implemented, as appropriate, to ensure the safety of the construction personnel. Operating procedures will be implemented to protect the environment and personnel during operations. Simulated materials will be used for training exercises.

5.1.4 Shielding - Not Applicable

5.1.5 Industrial

Potential hazards involved in the work scope will be identified, and reduced or eliminated prior to the commencement of construction activities. This project will maintain compliance with all applicable standards set forth in the U.S. Army Corps of Engineers' *Safety and Health Requirements Manual* during all phases of construction.

5.1.6 Fire Protection

The minimum requirements for fire protection will be in accordance with DOE Orders 5480.7a, 6430.1A and RLID 5480.7; DOE-Richland directive RLIP 5480.4C; National Fire Codes, and the Uniform Fire Code (to the extent that it is implemented by WAC 173-303). Backflow prevention will meet the requirements of WAC-248-54-285, *Public Water Supplies, Cross Connection Control*; and the American Waterworks Association (AWWA), Pacific Northwest Section, *Accepted Procedure and Practice in Cross Connection Control Manual.*

The fire alarm system will be connected to either the Hanford Radio Fire Alarm System or the City of Richland Fire Alarm System. Fire extinguishers will be installed where applicable. Fire hydrants will be located on the service road at 400-foot intervals. Every building will be protected by a minimum of two hydrants, each within 300 feet of the building. All major fire training props will have two fire hydrants installed on opposite corners of the prop. All fire hydrants will be equipped with two 2 1/2-inch and one 4-inch discharge ports with NH thread. All fire hydrants will be installed in accordance with National Fire Protection Association and AWWA standards. Fire hydrant flows of not less than 1,000 gallons per minute and 20 pounds per square inch residual pressure are required.

Conceptual design activities will include the appropriate level of detail to support the Fire Hazards Analysis (FHA). The preparation of the FHA is not within the scope of this report. Fire protection design features will be determined by an FHA, in accordance with the memorandum from EH-31.3, Subject: Guidance on the Performance of Fire Hazards Analysis, dated November 7, 1991. The FHA will be developed in conjunction with the conceptual design report, and will be revised as necessary to incorporate additional design features.

5.1.7 Traffic Safety

5.1.7.1 Horn Rapids Road Improvement. Access to the HAMMER Training Center will be via the existing Horn Rapids Road. Horn Rapids Road has been improved from Stevens Street to just west of Siemens Power Corporation. West of Siemens, Horn Rapids Road is a primitive, bituminous-surfaced road that will pose a traffic safety problem for students and staff accessing the HAMMER Training Center. Traffic accessing the training center will be predominantly from Stevens. Therefore, the roadway between Siemens and the training center will be improved. Design of the Horn Rapids Road improvement will be in accordance with the *Washington State Department of Transportation Design Manual*. Because Horn Rapids Road is maintained by the City of Richland, coordination with the City will be required.

5.1.7.2 Signs. Signs will be erected for safety, interpretation, and identification, as well as with provisions for persons with disabilities. Parking areas and traffic ways will be appropriately indicated with pavement markings and directional symbols, as per the *Manual on Uniform Traffic Control Devices*.

5.2 ENVIRONMENTAL REQUIREMENTS

5.2.1 Categorical Exclusion

This project will be designed to minimize the impact on the environment per the requirements of DOE Order 5400.1 and RLIP 5400.1, *General Environmental Protection Program*, and the requirements of Washington State Department of Health (WAC 46-272) for sanitary systems.

An environmental requirements checklist has been prepared to determine permits/approvals applicable to this project. Site evaluations required under the National Historical Preservation Act and the Endangered Species Act that also support preparation of National Environmental Policy Act Documentation have been completed. An Information Bulletin and Categorical Exclusion[6] was transmitted to DOE, Richland Operations Office, on 12 January 1994, for review. The DOE has determined that construction and operation of the facility is categorically excluded under DOE's NEPA regulations.

5.2.2 Liquid Effluent

The water used for training exercises, prop cleanup, *etc.*, will be recycled to the pond by gravity.

Surface run-on/off will be controlled to ensure that it is always diverted from facility roadways, parking areas, buildings, training props, and walkways.

5.2.3 Airborne Emissions

Dust control will be accomplished by the use of appropriate landscaping, irrigation, and roadway surfacing. Dust emissions from construction activities will be kept to a minimum. Burning activities will generally be performed with either propane or natural gas being used in a manner that simulates an actual burn scenario. Smoke will be produced using artificial methods that are environmentally safe (*i.e.*, Smoke Simulation Fluid placed in a fog machine, dry ice, *etc.*).

5.2.4 Noise

Occupational standards as set forth in 29 CFR 1910.95, *Occupation Noise Exposure,* pertaining to noise abatement will apply.

5.3 SAFEGUARDS AND SECURITY

The HAMMER Training Center is located in the 600 Area of the Hanford Site.

The design of any facilities for this project, badging, and escorts, will comply with DOE Order 5632.1C, *Protection and Control of Safeguards and Security Interests;* DOE M 5632.1C-1, *Manual for Protection and Control of Safeguards and Security Interests;* and RLID 5632.1B, *Asset Protection Requirements.* A safeguards and security-approved Construction and Security Plan will be provided per WHC-CM-4-33, *Security Manual.*

A chain-link fence, with a minimum height of 7 feet, will be constructed on the project perimeter. A gate will secure the site entrance from Horn Rapids Road. A second gate will secure the secondary entrance off the Hanford Patrol Academy Road.

Unobtrusive fencing, with a minimum height of 7 feet, will be installed along the south and west sides of the site to provide a pleasing entrance to the HAMMER Facility.

5.4 NATURAL FORCES

Facilities constructed as part of this project will be designed and constructed in accordance with Hanford Standard Design Criteria SDC 4.1, *Design Loads for Facilities.*

5.5 DESIGN FORMAT

All drawings will be Computer-Aided Drafting and Design drawn. Drawings will be prepared in accordance with SDC 1.3, *General Design Criteria.*

Specifications format will be per 16 division Construction Specifications Institute Standards.

5.6 QUALITY ASSURANCE

Quality Assurance (QA) activities for all contractors involved with the design, construction, testing, and inspection of the proposed facility will be formulated and executed through the use of the project-specific QA Project Plan (QAPP). The QAPP will establish QA program requirements that provide a format to verify inspection, testing, adequacy of design, and the quality of construction and manufactured components. The QA program requirements will be in accordance with DOE Order 5700.6C, *Quality Assurance.*

5.7 DECONTAMINATION AND DECOMMISSIONING

The design of the sanitary sewer system will include considerations for the retirement of any structures after their useful life. This project will not create any additional conditions or requirements for Hanford Site decontamination and decommissioning.

6.0 CODES, STANDARDS, AND CRITERIA

6.1 CIVIL

a. Manual on Uniform Traffic Control Devices.

b. Washington State Department of Health rules (WAC 246-272).

c. U.S. Army Corps of Engineers Manual, EM 1110-2-410, *Design of Recreation Areas and Facilities - Access and Circulation.*

d. American Association of Standard Highway Transportation Officials (AASHTO).

e. American Society for Testing and Materials (ASTM).

f. U.S. Army Corps of Engineers Manual, EM 385-1-1, *Safety and Health Requirements Manual* (as revised 1 October 1992).

g. Manual for Railway Engineering (current from August 1,1994 to July 31, 1995)

h. American Society of Civil Engineers Manual in Engineering Practice No. 37, *Design and Construction of Sanitary and Storm Sewers.*

i. Americans with Disability Act (ADA), *Accessibility Guidelines for Buildings and Facilities.*

j. Washington State Department of Transportation, *Design Manual.*

6.2 ARCHITECTURAL DESIGN

a. Uniform Building Code.

b. NFPA 101, *Life Safety Code.*

c. NFPA 1402, *Building Fire Service Training Centers.*

d. Uniform Federal Accessibility Standard.

e. Americans with Disability Act (ADA), *Accessibility Guidelines for Buildings and Facilities.*

6.3 STRUCTURAL DESIGN

a. *AISC Specification for the Design, Fabrication and Erection of Structural Steel for Buildings,* Ninth Edition.

b. *Structural Welding Code*, AWS Dl.l-90.

c. *Building Code Requirements for Reinforced Concrete,* ACI 318-89.

d. AASHTO Specifications for Highway Bridges.

e. *Snow Load Analysis for Washington*, SEAW 1975.

f. *Uniform Building Code*, Latest Edition.

g. The Aluminum Association, *Engineering Data for Aluminum Structures.*

h. *Timber Construction Manual,* AITC Second Edition.

i. *Seismic Design for Buildings*, TM 5-809-lO.

j. *Masonry Design for Buildings*, TM 5-809-3.

k. *Concrete Floor Slabs on Grade Subjected to Heavy Loads*, TM 5-809-12.

l. Hanford Standard Design Criteria SDC 4.1, *Design Loads for Facilities.*

m. NFPA 58, *Storage and Disposal of Liquid Petroleum Gas.*

6.4 MECHANICAL DESIGN

a. American Society of Heating, Refrigerating, and Air Conditioning Engineers, *Handbook of Fundamentals*, 1993 Edition.

b. American National Standards Institute, ANSI Standards.

c. American Society for Testing and Materials, ASTM Standards.

d. Uniform Plumbing Code (1994 Edition).

e. National Fire Protection Association, *National Fire Codes.*

f. *Occupational Safety and Health Standards*, Part 1910 of Title 29 CFR.

g. American Petroleum Institute (API), *Standards, Specifications and Recommended Practices.*

h. American Gas Association (AGA) Standards.

i. American Society of Mechanical Engineers (ASME), *Standards, Boiler and Pressure Vessel Codes.*

j. American Water Works Association (AWWA), Standards and Manuals.

k. Sheet Metal and Air Conditioning Contractor's National Association (SMACNA), Standards, Guides, Manuals.

l. Standard Design Criteria 5.1, *Heating, Ventilating, and Air-Conditioning.*

m. DOE Order 6430.1A, sections 110-12, *Energy Conservation.*

n. DOE Order 5480.7a, *Fire Protection.*

o. RLID 5480.7, *Fire Protection.*

p. RLIP 5480.4C, *Environmental Protection, Safety, and Health Protection for RL.*

q. National Fire Codes.

r. Uniform Fire Codes.

s. WAC-248-54-285, *Public Water Supplies, Cross Connection Control.*

t. American Waterworks Association (AWWA), Pacific Northwest Section, *Accepted Procedure and Practice in Cross Connection Control Manual.*

u. NFPA 1402, *Building Fire Service Training Centers.*

v. NFPA 1500, *Fire Department Occupational Safety and Health Program.*

6.5 ELECTRICAL DESIGN

a. DOE regulation 6430.1A, *General Design Criteria.*

b. American National Standards Institute (ANSI).

c. IEEE 142, *Grounding of Industrial and Commercial Power.*

d. Illuminating Engineering Society (IES).

f. National Electric Manufacturers Association (NEMA).

g. NFPA 70, *National Electrical Code.*

h. NFPA 72, *Protective Signaling Systems.*

i. NFPA 78, *Lightning Protection Code.*

j. NFPA 90A, *Air Conditioning and Ventilating Systems.*

k. NFPA 101, *Life Safety Code.*

l. Underwriters Laboratory (UL).

6.6 OTHER CODES AND STANDARDS

a. 29 CFR 1910.95, *Occupation Noise Exposure.*

b. DOE Order 5480.4, *Environmental Protection, Safety, and Health Protection Standards.*

c. 29 CFR 1926, *Safety and Health Regulation for Construction*, sub-part P, "Excavations."

d. WHC-CM-1-3, MRP 5.46, *Management Requirements and Procedures Manual*, dated 7 November 1991.

e. DOE Order 6430.1A, *General Design Criteria.*

f. WAC 173-303, *Dangerous Waste Regulations.*

g. EH-31.3, *Guidance on the Performance of Fire Hazards Analysis*, dated 7 November 1991.

h. DOE Order 5400.1, *General Environmental Protection Program.*

i. RLIP 5400.1, *General Environmental Protection Program.*

j. DOE Order 5632.1C, *Protection and Control of Safeguards and Security Interests.*

k. DOE Order 5632.9A, *Issuance and Control of Security Badges, Credentials, and Shields.*

l. DOE M 5632.1C-1, *Manual for Protection and Control of Safeguards and Security Interests.*

m. RLID 5632.1B, *Asset Protection Requirements.*

n. Hanford Standard Design Criteria SDC 1.3, *General Design Criteria.*

o. DOE Order 5700.6C, *Quality Assurance.*

p. RLIP 5480.4C, *Environmental Protection, Safety and Health Protection Standards for RL.*

q. DOE Order 5480.9A, *Construction Project Safety and Health Management.*

6.7 DEVIATION REQUEST FOR THE HAMMER PROJECT

6.7.1 Requirement for Which Deviation is Requested

The DOE Order 6430.1A, *General Design Criteria Division 1, General Requirements*, paragraph 0101-1, mandates the application of DOE Order 6430.1A as minimally acceptable requirements for facility design. Approval of a deviation to the divisions of DOE Order 6430.1A , listed below, is requested. In their stead, the U.S. Army Corps of Engineers' *Architectural and Engineering Instructions - Design Criteria* will be used.

a. DOE Order 6430.1A, Division 2, paragraphs 0201 through 0266-3 and 0267 through 0291, *Site and Civil Engineering*.

b. DOE Order 6430.1A, Division 3, *Concrete*.

c. DOE Order 6430.1A, Division 4, *Masonry*.

d. DOE Order 6430.1A, Division 5, *Metals*.

e. DOE Order 6430.1A, Division 6, *Wood and Plastic*.

6.7.2 Reason for Deviation Request

The Corps prepared the Functional Design Criteria for the HAMMER project. During Functional Design Criteria preparation, the Corps suggested that, because of their familiarity with the Corps design criteria document, efficiencies in the design and construction could be realized if they were permitted to use their own design criteria document for the HAMMER facility. This suggestion was reviewed, and it was established that certain portions of the project could be designed using Corps design criteria. This Functional Design Criteria currently reflects this approach.

6.7.3 Justification for Deviation Request

A hazard classification has been performed on the HAMMER facility, and it is classified as a General Use Facility, with normal public risk. Safety classifications of WHC systems, components, and structures are as identified and defined in WHC-CM-1-3, MRP 5.46, *Management Requirements and Procedures*. The WHC Safety Class 3 is the highest classification anticipated for any system or component of this project. The facilities are considered to be of the commercial type.

The Corps has a long history of designing significant structures and commercial-type facilities using their design criteria. The deviation from the selected sections of DOE Order 6430.1A, and the application of Corps design criteria to the selected portions of the project, will help to streamline the design and construction process. It will achieve economics by using design criteria the Corps project team is familiar with, and will have no adverse effects on programmatic or operating needs of the facility of the DOE objectives. The Corps will be required to meet the Federal, State, and local regulations that are imposed on DOE. No compromises will be made on the use of industrial or commercial codes and standards.

6.7.4 Quality Assurance, Safety, Health, and Environmental Protection

There will be no compromise to quality assurance, safety, health, or environmental protection requirements because of this deviation. A Project-Specific Quality Assurance Plan will be prepared. The Interagency Agreement between DOE and the Corps requires that the Corps administer a safety and health program for their activities that complies with all applicable safety and health regulations, directives, orders, and requirements of DOE-RL. This agreement also requires the Corps to comply with both Federal and State laws and regulations, including Federal or State permitting requirements.

6.7.5 Term

This request is for a permanent deviation.

7.0 REFERENCES

1. Westinghouse Hanford Company, *Hazardous Materials Management and Emergency Response (HAMMER) Training Center Feasibility Study*, Document No. WHC-EP-0319, Rev. 0, dated March 1990.

2. Westinghouse Hanford Company, *Hazardous Materials and Emergency Response Training Center Needs Assessment*, Document No. WHC-EP-0682, dated September 1992.

3. Westinghouse Hanford Company, *Site Evaluation Report For The Hazardous Materials Management and Emergency Response (HAMMER) Training Center*, Document No. WHC-SD-GN-SE-30003, Rev. 0, dated April 1992.

4. U.S. Army Corps of Engineers, *Architectural and Engineering Instructions - Design Criteria*, revised 11 December 1992.

5. Department of the Army, U.S. Army Corps of Engineers, Walla Walla District, *Quality Assurance Program Plan for the Support of the U.S. Department of Energy Richland Operations Office*, Document No. CEQAPP1.1, Rev. 2, dated 15 June 1993.

6. Westinghouse Hanford Company, *Categorical Exclusion for Hazardous Materials Management and Emergency Response Training Center, 600 Area, Hanford Site, Richland, Washington*, Document No. 9360983, dated 12 January 1994.