
DDESS Facility Transfer Study Facility Condition Report (Final)



Dahlgren Naval Surface Warfare Center, Virginia

December 10, 2003

PSC Project # 03811102



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Engineers ■ Architects ■ Planners

**DAHLGREN SCHOOL
DAHLGREN NAVAL SURFACE WARFARE CENTER, VIRGINIA
PROPERTY CONDITION REPORT**

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**DAHLGREN ELEMENTARY SCHOOL
DAHLGREN NAVAL SURFACE WARFARE CENTER, VIRGINIA
PROPERTY CONDITION REPORT
EXECUTIVE SUMMARY**

1.0 Executive Summary

This facility is a 41,000 square foot, one-story masonry veneer building constructed in 1942 with additional construction in 1994, 1996 and 2000. This facility serves 219 students from pre-kindergarten to eighth grade.

This facility exhibits progressive deterioration of concrete walkways, exterior wall finishes, roofing and roofing components, finishes, and mechanical, plumbing and electrical systems. This facility requires alterations to comply with life safety codes, ADA accessibility and major building systems guidelines.

Opinions of probable costs are calculated for immediate and long-term remediation planning. Opinions of probable costs are listed in Paragraph 4.0 and are summarized as follows:

1. Immediate Remediation - Items recommended for repairs or replacement within one year to resolve unsafe conditions, life safety fire code requirements, ADA accessibility guidelines and potential system failures:

Total Immediate Remediation Costs \$874,000

2. Intermediate Remediation – Items such as force protection, additional site paving, Title IX compliance costs, or playground equipment or surfacing. These are items of lower priority than immediate costs, but are higher priority than long-term remediation costs.

Total Intermediate Remediation Costs \$0

3. Long-term Remediation - Items recommended for repair or replacement within one to ten years for deferred maintenance of aging systems, non-life-threatening issues, other code requirements and remainder of ADA accessibility guidelines:

Total Long-term Remediation Costs \$1,025,000

Total remediation project costs are approximately \$ 1,899,000.

The report scope also included the cost of Plant Replacement Value (PRV), defined as the cost of a new facility, including associated sitework and parking. The estimated PRV for this facility is \$5,476,000. By comparing the remediation costs, plant replacement costs and the age of the building, we determined a modified recapitalization metric (MRM) for this facility. This ratio is defined as the required investment to correct deficiencies divided by the target investment required for a new building. The ratio for Dahlgren School is 0.57. A ratio over one

indicates it is more cost effective to build a new school rather than renovate the existing facility. It is our recommendation that the older portion of the school be scheduled for renovation within the next year and other repairs to major building systems be scheduled within the next ten years. A summary of the MRM calculation is shown on the next page.

ESL(yrs)	AGE (yrs)	RUL (yrs)	PRV (\$)	TARGET SUSTAIN. (Annual \$)	REMED. COSTS (\$)	REQUIRED INVEST. (Annual \$)	MRM	RECOMMEND
67	*26.4	*40.6	5,476,000	81,700	1,899,000	46,800	.57	Renovate

* Indicates Composite Number



Photo 1 – Close-up of Rusted Boiler Flange

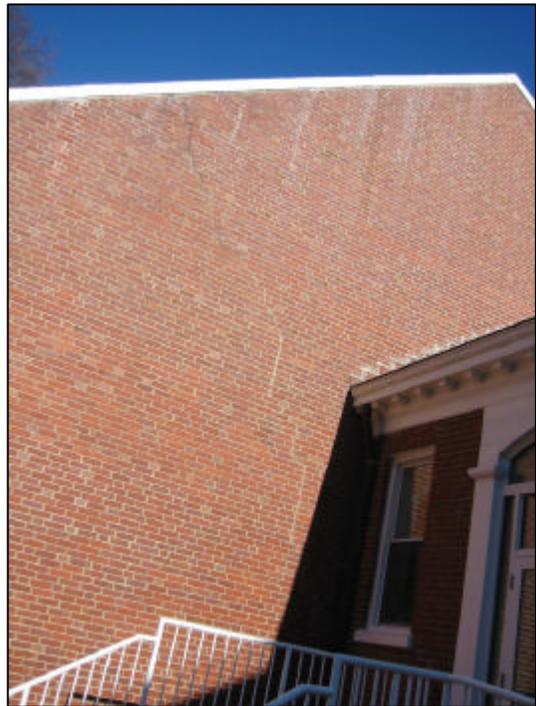


Photo 2 – Exterior Masonry Settlement Cracking. Original Building South Wall

**DAHLGREN ELEMENTARY SCHOOL
DAHLGREN NAVAL SURFACE WARFARE CENTER, VIRGINIA
PROPERTY CONDITION REPORT**

2.0 Purpose and Scope

2.1 Survey Team

An inspection team from Parkhill, Smith & Cooper, Inc., Engineers -Architects-Planners, performed a Property Condition Assessment for this facility December 17, 2002. The administration and staff fully cooperated with the survey team. The survey is based on the process, scope and intent of ASTM E 2018 -01 - Standard Guide for Property Assessments: Baseline Property Condition Assessment Process.

Parkhill, Smith & Cooper, Inc., working as an independent contractor, staffed the property survey with qualified registered professional architects and engineers as field observers. Each observer has experience commensurate with the subject property type and scope.

2.2 Published Standards

The following published standards, codes and guidelines were used for the property assessment survey:

- a. Americans with Disabilities Act Accessibility Guidelines (ADAAG) - ADA Standards for Accessible Design - 28 CFR Part 36, Revised July 1,1994 (ADAAG) - The Americans with Disabilities Act of 1990

This standard establishes guidelines for accessibility for individuals with disabilities under the Americans with Disabilities Act of 1990. The guideline specifies design tolerances for parking spaces, accessible routes, curb ramps, ramps, detectable warnings, signage, walkways, egress, entrances, exits, aisle and corridor widths, stairs, clear floor areas, toilets, doors, windows, drinking fountains, telephones, elevators, life safety warning systems and play areas.

The guideline specifies that no additions or alterations shall be undertaken which decreases accessibility or usability of a facility below that of new construction. Additions or alterations are not required to achieve greater accessibility than that required for new construction. Remediation recommendations are considered mandatory to achieve an acceptable facility.

The survey included a Tier I: Visual Accessibility Survey to identify possible problems concerning the Americans with Disabilities Act Accessibility Guidelines (ADAAG). The survey was limited to observations during the walk - through survey and included path-of travel, parking, entrances/exits, signage,

public toilet rooms, drinking fountains, elevators/lifts, recreational facilities and alarm systems. The survey did not include physical measurements or counts for any component or system. Opinions of probable costs for ADA remediation are identified separately and are not combined with other physical deficiencies.

- b. ASTM E 2018-01 - Standard Guide for Property Assessments: Baseline Property Condition Assessment Process - American Society of Testing Materials International

This guide defines customary practice for conducting a baseline property condition assessment to identify and communicate physical deficiencies to a user in a Property Condition Report. Walk-through procedures are outlined recommending various systems, components and equipment that should be observed. Physical deficiencies include presence of conspicuous defects or material deferred maintenance of a subject property's material systems, components or equipment.

The resulting Property Condition Report incorporates the information obtained from the walk-through survey, document review, staff interviews and opinions of probable costs for suggested remedies of identified physical deficiencies. Remediation of specific items in non-compliance is mandatory to achieve an acceptable facility.

- c. NFPA 101 Life Safety Code - ASNI/NFPA 101, 1994 Edition, Chapter 11 Existing Educational Occupancies - National Fire Protection Association

This code provides minimum requirements, with regard to function, for the design, operation and maintenance of new and existing buildings and structures to protect occupants by providing for safety from fire and similar emergencies. Safety is achieved by a combination of prevention, protection, warning systems and unobstructed egress. The code addresses construction, protection and occupancy features necessary to minimize danger to life from fire, smoke, fumes and panic. Warning systems are required to conform to ADAAG/ADA guidelines.

The resulting Property Condition Report incorporates the information obtained from the walk-through survey, document review, staff interviews and opinions of probable costs for suggested remedies of identified physical deficiencies. Remediation of specific items in non-compliance is mandatory to achieve an acceptable facility.

- d. Title IX Gender Equality - 34 CFR Part 106, Paragraph 106.41, Federal Register, May 9, 1980 - Nondiscrimination on the Basis of Sex in Education Programs or Activities Receiving Federal Financial Assistance

The major federal law prohibiting sex discrimination in educational institutions receiving financial assistance. A school must provide equal athletic opportunity

for both sexes, including facilities, equipment, supplies, game and practice schedules, travel and per diem allowances, coaching (including assignment and compensation of coaches), academic tutoring, housing, dining facilities and publicity. For the purposes of this study, only comparable facilities for each gender were considered. The facilities investigated were limited to those on each school campus. Off-site athletic facilities are not included in this study.

- e. Technical Manual TM 5-800-4, May 1994 - Programming Cost Estimates for Military Construction - Headquarters, Department of the Army

The basis of estimating opinions of probable costs, including unit cost values, escalation and contingency factors, and application of area location factors for military projects.

- f. RS Means Building Construction Cost Data, 60th Edition – 2002

The basis for determining unit and construction assembly values for detailed opinions of probable costs included as an Exhibit in this report.

- g. Guidance from the Under Secretary of Defense, June 3rd, 2002.

This guidance lists the most recent area location factors for each military installation.

- h. Facilities Recapitalization Front-End Assessment, Department of Defense, August 2002.

The basis for determining the recapitalization metric for Department of Defense facilities.

2.3 Property Assessment Survey Requirements

A walk-through property assessment survey was conducted during the field observers' site visit of the subject property to ascertain material physical deficiencies of the subject property and opinions of probable costs for remediation. Data obtained from the survey provides an objective and impartial evaluation of Domestic Dependent Elementary and Secondary Schools (DDESS) schools in the continental United States for the Department of Defense Education Activity (DoDEA), to ascertain the feasibility of facility transfers to Local Education Agencies (LEAs). The data will also aid DoDEA's analysis of associated costs to the Government for the possible transfer of DDESS students, facilities and operations to the corresponding adjacent LEAs.

2.4 Analysis

An analysis of each school was required to determine current physical condition, noting deficiencies and providing opinions of probable costs of remediation for each building

and system component in accordance with minimum acceptable standards and guidelines as listed previously.

2.5 Observations

The survey was based on the field observers' visual observations of representative areas and materials while walking through the subject property. The survey included interviews with administrative and facilities personnel, review of available construction documents, prior assessment reports and asbestos inspection reports.

2.6 Survey Methods

The survey consisted of non-intrusive visual observations, which were readily accessible and easily visible components and systems of the subject property. The survey was not technically exhaustive, excluded the operation of equipment and was conducted without the use of special protective clothing. The scope of work did not include removal of materials, testing, or use of equipment, such as scaffolding, metering/testing equipment or other devices.

2.7 Document Review and Interviews

The survey included interviews with administrative and facilities personnel, review of available construction documents, prior assessment reports and asbestos inspection reports. A copy of the Pre-Survey Questionnaire including facilities services responses to various physical conditions is included as Exhibit 7.3.

2.8 Out-of Scope Considerations

Out of scope considerations include, but are not limited to:

- a. Temporary maintenance buildings or classrooms.
- b. Entering crawl or confined spaces; walking on pitched roofs or roofs without built-in access.
- c. Determination of plumbing pressures, flow rates or fixture counts.
- d. Observation of flue connections, interiors of chimneys, flues or boiler stacks.
- e. Removal of electrical panel and device covers or operating electrical devices.
- f. Examination of elevator cables, sheaves, controllers, motors inspection tags or entering pits or shafts.
- g. Determining NFPA hazard classifications.
- h. Classifying, or testing fire rating assemblies; operating appliances or fixtures.
- i. Determining sound transmission coefficient (STC) ratings, flammability issues or regulations.
- j. Engineering calculations to determine any system's adequacy or compliance with any specific or commonly accepted design requirements.

- k. Adherence with AHERA or other hazardous material identification, abatement or operations and maintenance programs. Information from previous AHERA cost estimates is included in the opinions of probable costs.
- l. Identification, damage assessment or remediation recommendations for any type of mold, mildew or algae formations.
- m. Additional issues are outlined in ASTM E 2018 Paragraph 11.
- n. Force Protection . As no Joint Service Integrated Vulnerability Assessments were provided to the survey team, no costs are shown in this study for any recommendations contained in them. Some costs were included for specific force protection items requested by DoDEA.

2.9 Professional Services

The survey is not a professional architecture or engineering service and the resulting report and opinion of probable costs is not subject to laws governing the professional practice of architecture or engineering. Documents will not include an architects' or engineers' seal.

2.10 Assumptions

The following assumptions are included in the recommended remediation work and opinions of probable costs:

- a. Professional consulting service fees for remediation actions are excluded from opinions of probable costs.
- b. Replacement of HVAC supply ducting includes costs for removal and replacement of existing ceilings, light fixtures and other accessories with new.
- c. Sealing between the top of walls and roof or floor deck to achieve required fire rating includes costs for sealing all conduit and duct penetrations through the fire rated walls.
- d. Structural systems, general construction and utilities obscured by earth, paving, concrete slabs, solid walls or ceilings may have deterioration that was undiscoverable during the property survey. Remediation costs for undiscoverable conditions are excluded from opinions of probable costs. Contingency factors are included as described in Paragraph 4.0.
- e. New or existing duct penetrations through fire rated walls between rooms and paths of egress will have fire/smoke dampers. Fire rated walls between two spaces that are not utilized as a path of egress will have fire dampers. Costs are included for this work.
- f. Costs are included for future scheduled work not awarded under construction contract as of 1 October 2003. The exception is that PTR (Pupil-Teacher Ratio) projects are included in the study even though some have not been awarded. Per direction from DoDEA, these additions are included in the overall square footage of each school facility for the purposes of this study.
- g. Opinions of probable costs are expressed in FY04 values. Phase II of the study will incorporate the cost escalation for all work scheduled after this time.

- h. Title IX costs are for athletic facilities and associated amenities. Costs for personnel required under the law are not included.
- i. Life safety features such as fire sprinklers, fire alarms, strobes, emergency lighting and other equipment was assumed to be operational unless visible damage was observed. Equipment maintenance, repair and testing were assumed to be the Owner's responsibility.
- j. Costs for ADA compliance are based on current ADAAG accessibility guidelines. Compliance with all laws regarding ADA varies in each jurisdiction and may affect costs accordingly. Within this report, immediate remediation ADA items include the main public route into the building, at least one set of restrooms along the public route and accessible exits out of classrooms. Long-term items include signage, secondary exits and other toilet rooms. It is important to note that ADAAG accessibility guidelines are not immediate action requirements for existing buildings. The immediate priorities listed in this report are reasonable expectations of an LEA's requirements for transfer.
- k. Asbestos abatement costs exclude costs of consulting design, air monitoring or air testing during abatement activities or at final clearance, or material disposal.
- l. PRV costs are based on the size of the existing building.

2.11 Indoor Air Quality

The subject of indoor air quality has been receiving considerable attention by school officials all across the country, whether public, private or DDESS school system. Indoor air quality complaints can be due to a wide variety of factors that include: personal perceptions, a person's health, the amount of fresh air in a building, the humidity of the air in a building, and the building envelope. Some of these factors are difficult to quantify or detect. Terms like mold or mildew are often attached to indoor air quality complaints. It is important to note that there are several thousand types of mold and a relatively small portion have been tied to health problems. The issue of indoor air quality is difficult to address because there is not a set of definable symptoms and it is also difficult to define the source of an individual's discomfort.

People's symptoms are difficult to document. Allergies could be a contributing factor to IAQ complaints. Factors outside the school environment cannot be controlled by school staff. Fresh air, humidity control, and the building exterior envelope are areas school officials concentrate on to try to achieve acceptable indoor air quality. There are recommended guidelines for mechanical systems published by the American Society of Heating, Refrigeration and Air Conditioning Engineers that address fresh air requirements and humidity control. These guidelines have been implemented by building designers over the past ten to fourteen years. As such, schools designed and constructed before 1989 were not subject to these guidelines. Moisture intrusion in a building can also contribute to the possibility of mold growth. Older buildings in particular can have leaks in roofs, pipes or wall cavities that could allow moisture in a building. It is important for building owners to address moisture intrusion problems promptly.

In the responses received from Local Education Agencies during the course of this study, indoor air quality was listed as a high priority concern. Older schools or schools with older air conditioning systems generally do not comply with the ASHRAE standards and guidelines mentioned previously. In many cases, renovating a building to comply fully with current ASHRAE standards would be so costly as to require building a new school rather than renovating an existing facility. This cost is not economically possible in many school districts. In discussing the approach taken by LEA's, one responded saying their district makes improvements when a piece of mechanical equipment fails. They cannot satisfy all ASHRAE requirements in an older building, but they try to improve the overall air quality when they install new equipment.

The purpose of our study was to document the physical condition of the building and its systems. Indoor air quality testing was beyond the scope of our report. If a facility had IAQ complaints, we asked the school staff to report them to us in the pre-survey questionnaire and provide us an IAQ report if one had been performed. Where IAQ reports were provided, we used them to include costs for repair in the immediate term. In the case where a report was not performed, we recommended an IAQ study report with microbe classification. In the case where staff voiced an IAQ concern and we noticed a physical deficiency in the mechanical system or building envelope, we included cost to repair the physical deficiency. We did not perform any calculations on the mechanical systems.

3.0 System Description and Observations

Reference	Immediate	Long-term
3.1 Overall General Description		
<p>This facility is a 41,000 square foot, one story masonry veneer building originally constructed in 1942. Subsequent additions were as follows:</p> <ul style="list-style-type: none"> Generic Annex Building, approximately 1990 Classroom and Gymnasium, approximately 1994 Kindergarten Classrooms and Media Center, approximately 1996 <p>This facility serves 214 students from pre-kindergarten through eighth grades.</p> <p>This facility exhibits deficiencies and progressive deterioration of: site drainage, walkways, foundations, structural systems, exterior wall finishes, roofing, doors, and plumbing, mechanical and electrical systems.</p> <p>According to the AHERA Report, asbestos -containing materials (ACM) are present in this facility. Remediation recommendations are specified in Paragraph 3.9.</p> <p>This facility requires alterations to comply with ADA accessibility guidelines and life safety standards. Remediation recommendations are specified in Paragraphs 3.5 and 3.8.</p>		
3.2 Site		
3.2.1 Topography	X	
<p>Slopes away from building do appear to provide adequate drainage and the site does not appear to exhibit water -retaining problems with the exception of one area in the rear of the building. Corrective site grading to improve drainage is required in this area.</p>		
3.2.2 Storm Water Drainage		
<p>Site storm water drainage is by area drains and an underground collection system and does appear to be adequate for water control. No remediation recommen ded.</p>		

Reference	Immediate	Long-term
3.2.3 Ingress and Egress		
<p>The site is accessible by a public street in the front and a driveway in the back with very limited parking on the north side and some street parking at the curb in front of the building. Concrete walkways provide access and egress from the parking areas, the street and around the building perimeter. Service driveways are provided for delivery areas. Ingress and egress does not appear to be adequate to the older portion of the school. Provision of additional site access with walkways and ramps is required to the 1942 building. The newer additions appear to be accessible. No remediation recommended.</p>		
3.2.4 Paving, Curbing and Parking		
<p>Parking area paving is asphaltic concrete with concrete curbs and gutters in most areas. Paving is in good condition overall. Pavement marking is in fair condition. No remediation recommended.</p> <p>Parking areas do not appear to provide adequate parking spaces. Development of additional parking area is recommended.</p> <p>Remediation recommendations for compliance with ADA guidelines are specified in Paragraph 3.5.</p>		X
3.2.5 Flatwork		
<p>Concrete and asphaltic concrete walkways and ramps are in fair condition. Walkways exhibit cracking and spawling in some areas. Repair and replacement of damaged walkways is recommended.</p> <p>Remediation recommendations for compliance with ADA guidelines are specified in Paragraph 3.5.</p>		X
3.2.6 Landscaping and Appurtenances		
<p>Perimeter landscaping is highly developed. Some plantings around the 1994 addition are too close to the building and require rework to prevent moisture intrusion in the building.</p>	X	

Reference	Immediate	Long-term
3.2.7 Recreational Facilities and Title IX Compliance		
<p>A hard surface play area is available and is in good condition. It is accessed by an asphaltic concrete walk that leads to a covered gazebo. No remediation recommended.</p> <p>Play areas are provided with various types of equipment in good condition. No remediation recommended.</p> <p>Play surfaces include gravel, sand and shredded bark chips in fair condition. Play surfaces do appear to comply with the U.S. Consumer Safety Commission “Handbook for Public Playground Safety” requirements. No remediation recommended.</p> <p>A gymnasium provides indoor court sport recreational and assembly space. It was constructed in 1994 and is in good condition.</p> <p>The school does sponsor specific team sport programs for the junior high students and does appear to be in compliance with Title IX regulations. Separate locker room facilities are available and are comparable. No remediation recommended.</p> <p>Remediation recommendations for compliance with ADA guidelines are specified in Paragraph 3.5.</p>		
3.2.8 Utilities		
3.2.8.1 Water		
<p>An 8-inch water main enters the facility from the street in front of the school and feeds the main 6” water loop. The service does appear to be adequate and is assumed to be in good condition. No problems with water service were reported. No remediation recommended.</p> <p>A water meter is not available. Provision of a water meter is recommended for individual facility service metering. No other remediation recommended.</p> <p>A backflow preventer to protect against cross contamination is not provided. Provision of a backflow preventer is required. A backflow preventer device is also required in the fire sprinkler main line. The existing system has a check valve that may not be sufficient for backflow prevention. Addition of a backflow device</p>	X	X

Reference	Immediate	Long-term
for the fire suppression system is required.		
3.2.8.2 Electrical Service and Metering		
<p>Electrical service is multiple service located in the boiler room, is underground, and is fed by a 500 kva dry type pad-mounted transformer.</p> <p>The transformer is 120/208 volt, three phase, with integral distribution. This distribution serves the main switchboard 800 amp panel, the original building 225 amp panel, and the annex building 225 amp panel. The main switchboard is located in the boiler room.</p> <p>The service appears to be adequate and is in good condition. No remediation recommended.</p>		
3.2.8.3 Natural Gas		
Not applicable.		
3.2.8.4 Sanitary Sewer		
<p>Sewer service from the school flows to a main 8” sanitary line under the street in front of the school. Although most of the system is not visible, it appears to be adequate and in fair condition. No problems were reported. No remediation recommended.</p>		
3.2.8.5 Storm Sewer		
<p>Storm sewer system by area drains is provided. Roof drainage is by a gutter and downspout system that directly connects to an underground storm sewer collection system. The underground system is not visible and is assumed to be in fair condition. The storm sewer collects on the east and west side of the site. No remediation recommended.</p>		
3.2.8.6 Special Utility Systems		
<p>A fuel oil tank located outside the mechanical room serves the 225 gallon, polyshield turbo power domestic water heater and boiler in the mechanical room. The storage tank was not observable and test wells around the site were not present. The Base should monitor the tank regularly to ensure life safety and environmental</p>		

Reference	Immediate	Long-term
compliance. No remediation recommended.		
3.3 Structural Frame and Building Envelope		
3.3.1 Foundation		
The foundation is assumed to be reinforced concrete grade beams, supported by spread and spot footings with concrete floor slab -on-grade in fair condition. Repair and stabilization of selected areas where masonry has cracked is required.	X	
3.3.2 Building Frame		
Building frame is reinforced concrete masonry unit shear walls supporting steel joists and metal deck in the newer portions of the building and wood frame and shear wall with wood trusses supporting plywood sheathing in the original building. The building frames in the new additions are in good condition. The wood structure in the original building is in good condition. However, some of the masonry shear walls have cracked due to settlement of the foundation and thermal movement. Repair of damaged areas is required.	X	
Building frame for the auditorium is load-bearing masonry units supporting structural steel beams and steel trusses. Roof deck is wood sheathing in good condition. One bearing area near the hallway exhibits cracking and will require repair.	X	
Building frame for the gymnasium added in 1994 is reinforced concrete masonry units with long-span steel joists. Roof deck is metal decking. No remediation is recommended.		
3.3.3 Facades or Curtainwall		
3.3.3.1 Sidewall System		
Building exterior is face brick masonry veneer in poor condition. Masonry exhibits surface deterioration, stress cracking, missing and damaged masonry units and grout, and efflorescence and algae growth in various locations. Repair and replacement of damaged masonry, grout and surface cleaning is recommended. See Section 3.3.2 for costs.	X	
Windowsills are face brick in fair condition. Repair and replacement of damaged areas and general cleaning is		

Reference	Immediate	Long-term
<p>recommended.</p> <p>Building exterior at the annex is stucco in fair condition. No remediation recommended.</p>		
<p>3.3.3.2 Entrances/Exits</p>		
<p>The main entrance/exit is pre-finished anodized aluminum doors and framing with glazing at newer additions while the original building utilizes painted metal doors and frames. New addition entrance doors are in good condition while the original doors require replacement.</p> <p>Auxiliary exit/entrances are pre-finished anodized aluminum doors and framing with storefront glazing in good condition. Older entrances are painted metal doors and frames in poor condition. Repair and replacement of metal doors, framing and glazing sealant is required.</p> <p>Remediation recommendations for compliance with ADA guidelines are specified in Paragraph 3.5.</p>	X	
<p>3.3.3.3 Fenestration System</p>		
<p>The fenestration system is pre-finished anodized aluminum in the new additions and painted wood framing system with untinted double glazing in the original building. Windows in the original building were replaced within the last ten years. Windows are in good condition and no remediation recommended.</p>		
<p>3.3.3.4 Soffits</p>		
<p>Not applicable.</p>		
<p>3.3.3.5 Parapets</p>		
<p>Areas with parapets are extensions of the indicated wall systems and are protected with pre-cast concrete or metal coping. Concrete coping is in poor condition while the metal coping is in good condition. Repair of damaged concrete coping is required.</p>	X	

Reference	Immediate	Long-term
3.3.4 Roofing		
<p>Roofing is low slope ballasted EPDM, fully adhered EPDM and sloped pre-finished standing seam metal in the newer areas. Roofing in the original building is sloped composition shingle on wood decking. Newer areas have assumed rigid insulation while in older areas, the insulation is above the ceiling. Leaks are evident and repair is required at the 1994 addition where the EPDM seams are splitting and at the southwest corner of the gym. Roofing in all areas will require replacement in the next ten years.</p> <p>Flashing, coping, fascia, gutters and downspouts are pre-finished metal and are in fair condition, except for the concrete coping, which is in poor condition. Replacement of all flashing, coping, fascia, gutters and downspouts is recommended in the next ten years when the roof is replaced. Costs are included in the roof replacement costs.</p>	X	X
3.4 Interior Elements		
3.4.1 Common Areas		
<p>The facility has corridors, public toilets, private toilets, administrative offices, media center, classrooms, auditorium with stage, gymnasium with locker rooms, mechanical and electrical equipment rooms and an enclosed courtyard. Evaluation of general construction may include identification of various materials in the same area categories, not by specific material locations.</p> <p>Remediation recommendations for compliance with ADA guideline sand life safety standards are specified in Paragraphs 3.5 and 3.8.</p> <p>Lobbies and corridors:</p> <ul style="list-style-type: none"> ? Flooring is vinyl tile and carpet in good condition. No remediation is recommended. ? Walls are painted concrete masonry units and painted gypsum board in good condition. No remediation recommended. ? Solid ceilings are painted suspended gypsum board in good condition at the 1994 addition. No remediation recommended. 		

Reference	Immediate	Long-term
<p>? Suspended acoustical lay-in panel ceilings are in good condition in the remaining areas. No remediation recommended.</p> <p>Classrooms:</p> <p>? Flooring is vinyl tile and carpet in good and fair condition, respectively. Repair and replacement of carpet flooring in the original building is recommended in the next ten years.</p> <p>? Walls are painted concrete masonry units and painted gypsum board in good condition. No remediation recommended.</p> <p>? Suspended acoustical lay-in panel ceilings are in good condition in newer additions. Ceilings in the original building are in fair condition.</p> <p>Public and classroom toilets, Gymnasium locker rooms:</p> <p>? Flooring is ceramic tile in good condition. No remediation recommended.</p> <p>? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units or painted concrete masonry units above ceramic tile. Finishes are in good condition. No remediation recommended.</p> <p>? Suspended acoustical lay-in panel ceilings are in fair condition. No remediation recommended.</p> <p>Media center:</p> <p>? Flooring is carpet in good condition. No remediation recommended.</p> <p>? Walls are painted concrete masonry units and painted gypsum board in good condition. No remediation recommended.</p> <p>? Suspended acoustical lay-in panel ceilings are in good condition. No remediation recommended.</p> <p>Gymnasium:</p> <p>? Flooring is finished wood in good condition. No remediation recommended.</p>		

Reference	Immediate	Long-term
<p>? Walls are painted concrete masonry units in good condition. No remediation recommended.</p> <p>? Solid ceilings are exposed painted structure in good condition. No remediation recommended.</p> <p>Auditorium:</p> <p>? Flooring is carpet and finished wood. Carpet is in fair condition and wood flooring is in good condition. Replacement of all carpet flooring is recommended. No remediation of wood flooring recommended. Carpet replacement cost included with classroom carpet.</p> <p>? Walls are wood paneling in fair condition. Replacement of wall finishes is recommended. Acoustical panels are provided and are in good condition.</p> <p>? Suspended acoustical lay-in panel ceilings are in poor condition and should be replaced with the lights.</p> <p>Stage:</p> <p>? Flooring is finished wood in fair condition. No remediation recommended.</p> <p>? Walls are painted concrete masonry units in fair condition. No remediation recommended.</p> <p>? Suspended acoustical lay-in panel ceilings are in fair condition. Replacement of suspended acoustical lay-in panel ceilings is recommended with light replacement. Ceiling costs included with the auditorium.</p> <p>Interior doors are solid core wood doors in painted hollow metal frames and painted wood frames. Newer doors are in good condition while older doors are in fair condition and are recommended for replacement in the next two years. Door assemblies in the original building do not appear to be in compliance with ADA accessibility guidelines or life safety standards and remediation is required. Refer to Section 3.5 for remediation costs.</p> <p>Window coverings are louvered blinds in fair condition. No remediation recommended.</p>		X

Reference	Immediate	Long-term
3.5.3 Entrances/Exits		
<p>Main entrance/exit approach, doors and hardware along the accessible route do not appear to comply with accessibility guidelines. A minimum of one door or series of doors must comply with accessibility guidelines. In addition, an accessible ramp with handrails is needed for access to street drop-offs. Provision of complying construction is required. Refer to Section 3.3.3.2.</p> <p>Some auxiliary exit/entrance doors exit to porches do appear to provide exiting to accessible walkways or ramps. These doors are located at the front entrances to the additions.</p> <p>The auxiliary exit/entrance doors at the original building exit to porches that do not appear to comply with accessibility guidelines. Provision of complying construction is recommended.</p> <p>Interior doors along the accessible route are flush with corridor wall and do appear to allow clearance and approach accessibility for each accessible space. At least one door for each accessible space must comply with accessibility guidelines. Doors in the original building do not have accessible hardware and closing devices and these require replacement.</p>	X	X
3.5.4 Signage		
<p>Accessible signage along the accessible route in the building does not appear to comply with accessibility guidelines. Signage is required at all designated parking spaces and along the accessible route. Signage with raised Braille characters is required at all doors designating permanent rooms or spaces. Provision of complying construction is recommended.</p>		X
3.5.5 Public Toilet Rooms		
<p>Public toilets along the accessible route are available in the new addition and do appear to comply with accessibility guidelines for existing buildings. If renovations occur, the bathrooms in the original building may require ADA compliance.</p> <p>A public toilet is required along the accessible route and must provide accessible entry, maneuverability, clear floor space and accessible fixtures, accessories, recessed insulated lavatory piping, controls and stalls. Remediation of older bathrooms is</p>		

Reference	Immediate	Long-term
recommended in the long -term. Refer to Section 3.6.2.3.		
3.5.6 Drinking Fountains	X	
Drinking fountains along the accessible route do not appear to comply with accessibility guidelines. Drinking fountains are required to be accessible with corridor protrusion protection if not recessed into the wall or alcove with more than 4 inches protruding into the accessible route. A high/low water fountain is needed and required.		
3.5.7 Telephones		
Not applicable		
3.5.8 Elevators/Lifts		X
Platform/wheelchair lifts are not provided at stage areas. A platform/wheelchair lift for stage access is recommended.		
3.5.9 Recreational Facilities	X	
An accessible play area and equipment does not appear to be available within individual play groups. One play area with equipment and accessible surfacing material is required at each play area group. Remediation will be required.		
3.6 Mechanical and Electrical System		
3.6.1 Overall General Description		
The HVAC systems include rooftop condensers and air handlers, four pipe boiler and chiller with fan coil units, and a two pipe system with unit ventilators. The condition of these systems varies from good to poor. Hot water is supplied by domestic hot water heaters. Exhaust fans are provided to vent toilet and classroom areas. Electric service to the building is 120/208 voltage, 3 phase, 60 hz. There is not an emergency generator. The electrical service is generally in good condition.		

Reference	Immediate	Long-term
3.6.2 Plumbing		
<p>Water supply and waste piping appear to be fair to poor condition where visible. Some visible lines were corroded. Vents above the roof do appear to extend the proper height above the roofing. Replacement of the supply piping in the mechanical room is required.</p> <p>A backflow prevention device has not been provided on the domestic water supply line. Remediation is required.</p> <p>Some piping was concealed in under-floor piping chases and was not observed because of the presence of asbestos.</p>		
3.6.2.1 Supply and Waste Piping		
<p>Supply piping to the building runs in a 6" water loop. Branch lines and lines supplying individual fixtures appeared to be in fair condition where observable. Waste piping at sinks appeared to be in good condition. No problems with supply and waste piping were reported other than those mentioned in the boiler room. However, waste and supply piping is nearly 60 years old in the main building. Replacement of this piping is recommended when the asbestos is removed.</p>		X
3.6.2.2 Domestic Hot Water Production		
<p>Most of the domestic hot water is provided by a 225-gallon, fuel oil supplied water heater. There are three other smaller water heaters that serve specific areas. Combustion air from the fuel oils serves the boiler in the mechanical room. This hot water heater system is generally in fair condition and does not require immediate replacement, although it is recommended with the boiler replacement. The boiler is a safety hazard and will require replacement. Refer to Section 3.6.3.1 for boiler replacement.</p>		X
3.6.2.3 Fixtures		
<p>The existing plumbing system is approximately 60 years old in the original building. The remaining plumbing is less than 12 years old. Fixture connections appear to be in fair condition. Plumbing fixtures are generally new throughout and are generally in good condition. Renovation of the four single use toilets adjacent to the stage is recommended.</p>		X

Reference	Immediate	Long-term
3.6.2.4 Fuel Piping		
Fuel oil service is single service, located outside the mechanical room in an underground tank. Piping is routed to the domestic water heater and boiler and appears to be in fair condition. The fuel oil service does appear to be adequate and is in fair condition. Repair and replacement of fuel piping is recommended when the boiler is replaced. See Section 3.6.3.1.		
3.6.3 Mechanical System		
3.6.3.1 Heat Generating Equipment	X	
Heat is generated by a Kewanee 2040 MBH boiler fed by fuel oil located in the mechanical room. It supplies the hot water loop that feeds individual fan coil units. The boiler flanges and piping are rusted and corroded. The boiler casing is rusting at the seams. Boiler replacement and associated piping is required as a safety measure.		
3.6.3.2 Heating Distribution Equipment	X	X
Heat is distributed by individual fan coil units in each room, which are fed by the main boiler. These fan coil units will require replacement in the next ten years as they are in fair condition. Approximately fourteen are not working properly now and will require replacement in the next two years.		
3.6.3.3 Cooling Equipment		
Cooling for the school is primarily through the use of pad-mounted and roof-mounted chillers, which feed the main loop from the main mechanical room and the mechanical room in the 1994 addition. These chillers appear to be in good condition.		
3.6.3.4 Cooling Distribution Equipment		X
Cooling is distributed through the fan coil units primarily. However, the gymnasium is served by an air handler and roof-mounted condenser which feeds a horizontal discharge to a main trunk line in the gym. In addition, the 1994 addition utilizes a liebert unit to provide the required amount of makeup air. The 1996 addition utilizes a ceiling mounted air handler. Cooling distribution equipment is in fair condition and remediation is anticipated in the next ten years.		

Reference	Immediate	Long-term
3.6.3.5 Control System		
The fan coil units are tied into a DDC system that appears to be fairly new and in good condition. No remediation recommended.		
3.6.4 Electrical		
3.6.4.1 Main Switchboard		
The main electrical distribution panel is an 800 amp, 120/208 volt, 3 phase, 4 wire panelboard located in the boiler room. The panel appears to be in good condition and remediation is not required. Based on an average load of 12 watts per square foot, the panel appears to be adequate to meet the electrical demand of the school. There appears to be limited panel capacity for future expansion.		
3.6.4.2 Distribution and Panels		X
Electrical distribution and branch panels appear to be adequately sized and are in good condition . Replacement of the stage control panels and wiring in the auditorium will be required. No remediation is recommended for the remainder of the building.		
3.6.4.3 Interior Lighting		
Typical classroom lighting is recessed type fluorescent fixtures. Lamps appear to be T-8 with energy saving ballasts. Light levels appeared to be adequate. Lighting is generally good and remediation is not required. However, the lighting in the auditorium is poor and will require replacement. Hallway and corridor lighting consists of recessed and parabolic fluorescent troffers that appear to provide adequate light levels. These lights are generally in good condition and remediation is not required.		X
3.6.4.4 Exterior Lighting		
Exterior lighting around the school consists of metal halide type wall pack fixtures. These fixtures appear to be functioning properly. Light levels on the exterior appear to be adequate. Additional lights should be added to the front of the school and are recommended here. No independent parking lot light is provided.		X

Reference	Immediate	Long-term
3.6.4.5 Security System		
The security system is currently inoperable.		
3.6.4.6 Intercom System		
The original intercom system is old and outdated. The volume was very low in the 1994 addition. Replacement of the PA system and intercom is recommended.		X
3.6.4.7 Educational Television		
The CCTV system appears to be adequate. No remediation recommended.		
3.6.4.8 Computer Network		
A new LAN system has been installed within the last five years. No problems were reported and no remediation is recommended.		
3.7 Vertical Transportation		
Platform/wheelchair lifts are required at the stage and should be provided in the next ten years. See Section 3.5.8. Remediation recommendations for compliance with ADA guidelines are specified in Paragraph 3.5.		
3.8 Life Safety and Fire Protection		
3.8.1 Sprinklers and Standpipes		
A 6" dry-type fire sprinkler system is provided and serves the original building. The riser is located in the boiler room. Provisions for multi-purpose dry-type fire extinguishers within required travel distances appear to be in compliance with life safety codes. No remediation required.		
3.8.2 Alarm Systems	X	
Visual alarm system does not appear to comply with life safety standards or ADA guidelines. Visual alarms, located 80 inches above the floor to the bottom of the lens and are required in all corridors, common use spaces, and rooms with more than one occupant. The building has strobes in corridors, but they are not		

Reference	Immediate	Long-term
provided in classrooms or other occupiable rooms. Provision of a complying alarm system is required.		
3.8.2.1 Fire Evacuation Alarm System		
The school fire alarm and panel system is a relatively new FCI 7200 panel. It is tied into the base Kingfisher panel mounted outside the front door and relayed by antenna to Base fire personnel. No remediation required.		
3.8.2.2 Kitchen Fire Protection System		
Not applicable.		
3.8.3 Corridor and Separation Walls		
Exist corridor and area separation walls do not all seal to deck. Firestopping sealing between wall and bottom of roof deck, structural framing and around all wall penetrations may be required to comply with life safety standards. The facility is completely fire sprinkled and verification of compartmentalization into areas not exceeding 30,000 square feet is recommended to be performed by Base Fire Marshall. Remediation recommended for smoke compartmentalization. Borrowed lights do not have fire rated glazing and do not appear to be within acceptable size limitations. Addition of fire rated glazing is required.	X	X
3.8.4 1994 Addition Mechanical Room		
The electrical panel serving this addition does not have the required three feet of clearance between it and the mechanical piping. This panel must be moved and the walls of the room must be extended to deck.	X	
3.8.5 Doors		
Interior doors and hardware at the original building do not appear to comply with life safety fire rating requirements due to hardware and assembly deficiencies. Refer to Section 3.5 for costs. Emergency exit doors to the building exterior do not appear to comply with life safety fire rating requirements in the original		

Reference	Immediate	Long-term
<p>building. Refer to Section 3.5.</p> <p>Area separation doors do not appear to comply with life safety fire rating requirements. These requirements may be necessary depending on verification of sprinklered area compartments. The required number of smoke detectors does not appear to be provided. Remediation is required and included in 3.8.2.</p> <p>Replacement of non-complying fire rated doors including hardware, panic devices, smoke detectors, magnetic hold open devices, fire rated glazed openings and sealing system is required.</p> <p>Remediation recommendations for compliance with ADA guidelines are specified in Paragraph 3.5.</p>		
<p>3.8.6 Classroom Emergency Exiting</p>		
<p>Operable marked window units provide classroom emergency exiting and do appear to comply with emergency exiting requirements. No remediation recommended.</p> <p>Some exit doors to the building exterior provide classroom emergency exiting and do not appear to be accessible. These locations occur at the 1996 addition. They are not required to be accessible, although many school systems choose to make them accessible.</p>		
<p>3.8.7 Emergency Egress Lighting</p>	X	
<p>Emergency lighting is provided in the new wings and auditorium, but is not provided in the older portions of the building. Renovation in these areas is required.</p>		
<p>3.9 Asbestos Containing Materials</p>		
<p>According to the AHERA Report, remaining asbestos -containing materials (ACM) are friable, not damaged, and are primarily located in the under floor pipe chases. This material consists of pipe insulation and pipe fittings.</p> <p>Removal of the remaining ACM and replacement of affected insulation and piping is recommended.</p>		X

4.0 Opinions of Probable Costs to Remedy Physical Deficiencies

4.1 General

Opinions of probable cost are provided to address physical deficiencies in the facility. Physical deficiencies are divided into three categories: Immediate, Intermediate, and Long-term Remediation items as requested in the scope of work. The costs shown are based on visual observations from the walk-through survey. Quantities used in performing the estimate are approximate; no measurements were taken on site. Unit costs are parametric based on gross square footage for major building systems and components.

4.2 Parametric Costs

The appendix of each report contains the parametric opinions of probable costs. Each major physical deficiency is listed with the report section number. The unit prices shown were derived from RS Means Building Construction Costs Data, 60th Edition, 2002 and from prior experience at the Military Base. Immediate, Intermediate and Long-term Remediation Costs are based on Fiscal Year 2004 (FY04) values. Each item is marked up for general contractor overhead and profit and escalated for two years at 2.87% per year. It is assumed that these costs will be escalated beyond 2004 by the user. Each cost is also adjusted by a location adjustment factor based on the average nationwide statistical labor costs as established by the Office of the Under Secretary of Defense, June 3, 2002. An estimate contingency is applied to all costs to cover costs for unforeseen conditions and unknown quantities. The contingency amount is contingent upon the level of scope and detail. Typically, budgetary opinions of probable costs provided at a “pre-concept” phase include a 15% contingency. Opinions of probable costs for “construction document” phase projects include 5 - 10% contingencies. A 15% contingency for the opinions of costs, based on the US Army Technical Manual TM 5-800-4 - Programming Cost Estimates for Military Construction, is included in this study due to the broad nature of the survey.

4.3 Overall Cost Summary

The total cost summary for remediation of physical deficiencies follows in this section. The summary indicates the distribution of Immediate Remediation costs for the three primary standards used for evaluation: life safety, ADA, and major building system guidelines. Intermediate remediation items fall into categories of Title IX, force protection, play surfacing, and additional sitework for safe traffic flow. Long-term Remediation costs are indicated for additional ADA work and deferred maintenance items. Deferred maintenance is work that cannot be performed by routine maintenance and requires capital improvements. Examples of deferred maintenance include new roofing and asbestos abatement of non-friable materials.

4.4 Detailed Cost Summary

A detailed cost summary is included at the end of this section for Immediate Remediation work recommended for completion within 1 year, and Long-term Remediation recommended for completion within 1 – 10 years. Detailed distributions are not given for intermediate costs as they apply to individual line items, in general. Intermediate costs are a lower priority item than immediate costs. Cost distributions for each building system is indicated in tabular form for all items requiring remediation.

4.5 Discussion of Results

Section 3.0 of the report lists the physical deficiencies and associated opinions of probable costs of remediation for each building system. Total costs for Immediate, Short-term and Long-term Remediation items and are as follows:

Immediate	\$ 874,000
Intermediate	\$ 0
Long-term	<u>\$ 1,025,000</u>
Total Remediation Costs	\$ 1,899,000

A calculation of Plant Replacement Value (PRV) was also performed for this facility. Plant replacement value represents the cost of a new building and associated sitework for FY04 pricing. The PRV for this school is approximately \$5,476,000. This cost was determined based on the following square foot cost escalated from TM 5-800-4:

\$136.29/sf

These costs were then multiplied by the building square footage and applicable cost escalation and contingency factors. PRV is often used as a comparison to renovation and repair costs for economic feasibility studies.

Before a comparison of remediation costs and Plant Replacement Value (PRV) can be performed, it is important to consider the age of the building. According to the Department of Defense's "Facilities Recapitalization Front End Assessment, August 2002," the government's goal is a 67 year recapitalization rate. Sixty-seven years is the expected service life for a building in the DOD inventory and we have carried that assumption to this analysis. For the purpose of our study, we are utilizing relative useful life of a building, defined as the 67 year expected service life minus the age of the building. In facilities with additions, we have compiled a composite facility age using the areas and ages of each component making up the whole facility.

The above DOD reference calculates recapitalization rate as the plant replacement value divided by the planned annual sustainment costs to determine the number of years of expected life. A number greater than 67 is considered good because it exceeds the government goal. Sustainment in this model is the cost of annual maintenance and improvements. Because our study is based on a large, one-time investment and not

annual maintenance dollars, it does not transfer directly to our study. However, the logic of method is easily transformed into a Modified Recapitalization Metric (MRM).

For the purpose of this study, the modified recapitalization metric (MRM) is computed considering the following factors:

Expected Service Life (ESL): 67 years per DOD

- Relative Useful Life (RUL): Expected service life minus the age of the building. Because Dahlgren is a combination of three recent additions and one older building, a composite relative useful life has been used.
- Target Sustainment: The annual investment required to keep the building in good working order to achieve an ESL of 67 years. It is calculated by dividing the plant replacement value by the ESL.
- Plant Replacement Value (PRV): The cost to replace the school building, sitework, furniture and associated assets. It is presented in FY 2004 dollars for this study.
- Remediation Costs: These are the total construction costs associated with correcting deficiencies noted in this study.
- Required Investment: The level of investment required to correct the current deficiencies spread out over the remaining useful life. It is calculated by dividing remediation costs by the RUL.

The MRM is the ratio of required investment to target sustainment (investment). A ratio less than one indicates it may be more cost effective to renovate a facility rather than replacing it. Conversely, an MRM greater than one indicates replacement may be the better option because the government could spend less sustaining a new facility rather than investing in an older, less modern facility.

The following table summarizes the MRM calculation for Dahlgren Elementary School.

ESL (yrs)	AGE (yrs)	RUL (yrs)	PRV (\$)	TARGET SUSTAIN (Annual \$)	REMED. COSTS (\$)	REQUIRED INVEST. (Annual \$)	MRM	RECOMMEND
67	*26.4	*40.6	5,476,000	81,700	1,899,000	46,800	.57	Renovate

* Represents Composite Number

Based on our analysis of the remediation costs, it is our opinion that the portions of the original school building should be renovated to bring it into compliance with applicable codes and repair problems with major building systems. A majority of the school is less than ten years old and should be serviceable for several years.

Refer Appendix for Total Cost Summary

Refer Appendix for Immediate Remediation Item Detail Table

Refer to Appendix for Long-Term Immediate Remediation Item Detail Table



Photo 1 – Moisture Problem, Gymnasium



Photo 2 – Plantings Against Wall



Photo 3 – Close-up of Rusted Boiler Flange



Photo 4 – Rusty and Deteriorating Boiler



**Photo 5 – Exterior Masonry Settlement Cracking.
Original Building South Wall**



Photo 6 – Interior Cracking of South Exterior Wall. Original Building.