DDESS Facility Transfer Study
Facility Condition Report (Final)

Fort Knox, Kentucky

December 10, 2003

PSC Project # 03811102

dodea
DEPARTMENT OF DEFENSE EDUCATION ACTIVITY

PSC Parkhill, Smith & Cooper, Inc.
Engineers ▪ Architects ▪ Planners

FORT KNOX SCHOOLS
FORT KNOX, KENTUCKY
PROPERTY CONDITION REPORT

TABLE OF CONTENTS

FORT KNOX HIGH SCHOOL
FORT KNOX, KENTUCKY
PROPERTY CONDITION REPORT
EXECUTIVE SUMMARY

1.0 Executive Summary

Data obtained from the survey provides an objective and impartial evaluation of the Fort Knox High School for the Department of Defense Education Act ivity (DoDEA) in their object benefit analysis, to ascertain the feasibility of renovating or replacing facilities.

This facility is a 121,400 square foot, one-story masonry veneer building originally constructed in 1959 with additional construction in 1985, 1986, 1987 and 1989. This facility serves 520 students from ninth to twelfth grade.

Observed deficiencies primarily consisted of major building systems which have worn out or become obsolete. This facility requires alterations to correct deficiencies in the mechanical system, plumbing system and roof, as well as asbestos abatement. It also requires action to address life safety code and ADA accessibility issues.

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 life safety fire code requirements, ADA accessibility guidelines and pot ential major building system failures:

   Total Immediate Remediation Costs $2,628,000

2. Intermediate Remediation – Items such as force protection, additional site paving, Title IX compliance costs, or playground equipment or surfacing. These are items of low er 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 agi ng systems, non-life-threatening issues, other code requirements and remainder of ADA accessibility guidelines:

   Total Long-term Remediation Costs $2,839,000

Total remediation project costs are approximately $ 5,467,000.

The report scope also included th e 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 $19,702,000. 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 Fort Knox High School is .47. 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 school be scheduled for renovation within the next year to correct immediate deficiencies and othe r repairs to major building systems be scheduled within the next ten years. A summary of the MRM calculation is shown below.

ESL(yrs)	AGE (yrs)	RUL (yrs)	PRV ($)	TARGET SUSTAIN. (Annual $)	REMED. COSTS ($)	REQUIRED INVEST. (Annual $)	MRM	RECOMMEND
67	*27.8	*39.2	19,702,000	294,100	5,467,000	139,500	.47	Renovate

* Indicates Composite Number

Poor Lighting in Corridor

Non-compliant Restroom

KINGSOLVER ELEMENTARY SCHOOL
FORT KNOX, KENTUCKY
PROPERTY CONDITION REPORT
EXECUTIVE SUMMARY

1.0 Executive Summary

Data obtained from the survey provides an objective and impartial evaluation of the Kingsolver Elementary School for the Department of Defense Education Activity (DoDEA) in their object benefit analysis, to ascertain the feasibility of renovating or replacing facilities.

This facility is a 38,000 square foot, one-story masonry veneer building originally constructed in 1956 with additional construction in 1961, 1983, 1986, 1987 and 1989. This facility serves 252 students from pre-kindergarten to third grade.

Observed deficiencies primarily consisted of major building systems which have worn out or become obsolete. This facility requires alterations to correct deficiencies in the mechanical system, electrical system, plumbing system and roof, as well as asbestos abatement. It also requires action for life safety code items and ADA 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 life safety fire code requirements, ADA accessibility guidelines and potential major building system failures:

   Total Immediate Remediation Costs $1,386,000

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 $868,000

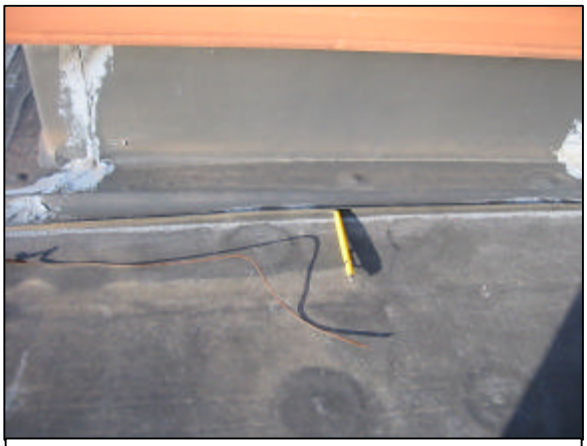
Total remediation project costs are approximately $ 2,254,000.

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 $5,545,000. 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 r atio for Kingsolver Elementary School is .79. 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 school be scheduled for renovation within the next year t o correct immediate deficiencies and other repairs to major building systems be scheduled within the next ten years. A summary of the MRM calculation is shown below.

ESL(yrs)	AGE (yrs)	RUL (yrs)	PRV ($)	TARGET SUSTAIN. (Annual $)	REMED. COSTS ($)	REQUIRED INVEST. (Annual $)	MRM	RECOMMEND
67	*32.5	*34.5	5,545,000	82,800	2,254,000	65,300	.79	Renovate

* Indicates Composite Number



Flashing Problem

Non-Life Safety Compliant Vestibule

MACDONALD INTERMEDIATE SCHOOL
FORT KNOX, KENTUCKY
PROPERTY CONDITION REPORT
EXECUTIVE SUMMARY

1.0 Executive Summary

Data obtained from the survey provides an objective and impartial evaluation of the MacDonald Intermediate School for the Department of Defen se Education Activity (DoDEA) in their object benefit analysis, to ascertain the feasibility of renovating or replacing facilities.

This facility is a 65,300 square foot, one-story masonry veneer building originally constructed in 1967 with additional construction in 1992. This facility serves 350 students from fourth to sixth grade.

Observed deficiencies primarily consisted of major building systems which have worn out or become obsolete. This facility requires alterations to correct deficiencies in the structural and mechanical system, some portions of the roof, and some of the electrical system .

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 summ arized as follows:

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

   Total Immediate Remediation Costs $781,000

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 $200,000

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 $1,198,000

Total remediation project costs are approximately $ 2,179,000.

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 $9,739,000. 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 Macdonald Intermediate School is .47. 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 school be scheduled for renovation within the next year to correct immediate deficiencies and other repairs to major building systems be scheduled within th e next ten years. A summary of the MRM calculation is shown below.

ESL(yrs)	AGE (yrs)	RUL (yrs)	PRV ($)	TARGET SUSTAIN. (Annual $)	REMED. COSTS ($)	REQUIRED INVEST. (Annual $)	MRM	RECOMMEND
67	*34.9	*32.1	9,739,000	145,400	2,179,000	67,900	.47	Renovate

* Indicates Composite Number

Typical Non-compliant Door

Non-compliant Bathroom

MUDGE ELEMENTARY SCHOOL
FORT KNOX, KENTUCKY
PROPERTY CONDITION REPORT
EXECUTIVE SUMMARY

1.0 Executive Summary

Data obtained from the survey provides an objective and impartial evaluation of the Mudge Elementary School for the Department of Defense Education Activity (DoDEA) in their object benefit analysis, to ascertain the feasibility of renovating or replacing facilities.

This facility is a 46,400 square foot, one-story masonry veneer building originally constructed in 1961 with additional construction in 1986, 1987, 1989 and 1997. This facility serves 330 students from pre-kindergarten to third grade.

Observed deficiencies primarily consisted of major building systems which have worn out or become obsolete. This facility requires alterations to correct deficiencies in the structural system, mechanical system, electrical system, plumbing system, and asbestos abatement. A roof replacement project was recently awarded and as such no costs are included in this study. It also requires action to address life sa fety code and ADA issues.

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 repai rs or replacement within one year to resolve life safety fire code requirements, ADA accessibility guidelines and potential major building system failures:

   Total Immediate Remediation Costs $1,082,000

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 $25,000

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 $1,220,000

Total remediation project costs are approximately $ 2,327,000.

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 estimat ed PRV for this facility is $6,766,000. 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 c orrect deficiencies divided by the target investment required for a new building. The ratio for Mudge Elementary School is .68. 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 school be scheduled for renovation within the next year to correct immediate deficiencies and other repairs to major building systems be scheduled within the next ten years. A summary of the MRM calculation is shown below.

ESL(yrs)	AGE (yrs)	RUL (yrs)	PRV ($)	TARGET SUSTAIN. (Annual $)	REMED. COSTS ($)	REQUIRED INVEST. (Annual $)	MRM	RECOMMEND
67	*32.9	*34.1	6,766,000	101,000	2,327,000	68,200	.68	Renovate

* Indicates Composite Number

Poor Lights and Ceiling

Foundation Settlement

PIERCE ELEMENTARY SCHOOL
FORT KNOX, KENTUCKY
PROPERTY CONDITION REPORT
EXECUTIVE SUMMARY

1.0 Executive Summary

Data obtained from the survey provides an objective and impartial evaluation of the Pierce Elementary School for the Department of Defense Educati on Activity (DoDEA) in their object benefit analysis, to ascertain the feasibility of renovating or replacing facilities.

This facility is a 48,300 square foot, one-story masonry veneer building originally constructed in 1959 with additional construction in 1986, 1987, 1997 and 1998. This facility serves 353 students from pre-kindergarten to third grade.

Observed deficiencies primarily consisted of major building systems which have worn out or become obsolete. This facility requires alterations to correct deficiencies in the structural system, mechanical system, some roofing, site paving and drainage, and asbestos abatement. The facility also requires action to correct life safety code issues and considerable secondary ADA issues.

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 life safety fire code requirements, ADA accessibility guidelines and potential major building system failures:

   Total Immediate Remediation Costs $1,161,000

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 r eplacement 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 $1,048,000

Total remediation project cost s are approximately $2,209,000.

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 $7,047,000. 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 Pierce Elementary School is .65. 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 school be scheduled for renova tion within the next year to correct immediate deficiencies and other repairs to major building systems be scheduled within the next ten years. A summary of the MRM calculation is shown below.

ESL(yrs)	AGE (yrs)	RUL (yrs)	PRV ($)	TARGET SUSTAIN. (Annual $)	REMED. COSTS ($)	REQUIRED INVEST. (Annual $)	MRM	RECOMMEND
67	*34.5	*32.5	7,047,000	105,200	2,209,000	68,000	.65	Renovate

* Indicates Composite Number

Paving in Poor Condition

Cracked Masonry

SCOTT MIDDLE SCHOOL
FORT KNOX, KENTUCKY
PROPERTY CONDITION REPORT
EXECUTIVE SUMMARY

1.0 Executive Summary

Data obtained from the survey provides an objective and impartial evaluation of the Scott Middle School for the Department of Defense Education Activit y (DoDEA) in their object benefit analysis, to ascertain the feasibility of renovating or replacing facilities.

This facility is a 69,600 square foot, one-story masonry veneer building originally constructed in 1957 with additional construction in 1994 and 1997. The building survived a fire in the early 1990's and was completely renovated afterward. This facility serves 380 students from seventh to ninth grade.

Observed deficiencies primarily consisted of major building systems which have worn out or become obsolete. This facility requires alterations to correct deficiencies in its site paving and some minor roof work. There are also a few life safety and ADA issues which require action.

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 life safety fire code requirements, ADA accessibi lity guidelines and potential major building system failures:

   Total Immediate Remediation Costs $321,000

2. Intermediate Remediation – Items such as force protection, additional site paving, Title IX compliance costs, or playground equipment or surfacing. T hese 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 $490,000

Total remediation project costs are approximately $ 811,000.

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 $10,381,000. 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 Scott Middle School is .17. 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 school be scheduled for renovation within the next year to correct immediate defici encies and other repairs to major building systems be scheduled within the next ten years. A summary of the MRM calculation is shown below.

ESL(yrs)	AGE (yrs)	RUL (yrs)	PRV ($)	TARGET SUSTAIN. (Annual $)	REMED. COSTS ($)	REQUIRED INVEST. (Annual $)	MRM	RECOMMEND
67	*36	*31	10,381,000	154,900	811,000	26,200	.17	Renovate

* Indicates Composite Number

Damaged Wall Material

Non-ADA Door Hardware

VAN VOORHIS ELEMENTARY SCHOOL
FORT KNOX, KENTUCKY
PROPERTY CONDITION REPORT
EXECUTIVE SUMMARY

1.0 Executive Summary

Data obtained from the survey provides an objective and impartial evaluation of the Van Voorhis Elementary School for the Department of Defen se Education Activity (DoDEA) in their object benefit analysis, to ascertain the feasibility of renovating or replacing facilities.

This facility is a 83,600 square foot, one-story masonry veneer building originally constructed in 1958 with additional construction in 1986, 1987, 1992, 1995, 1996 and 2003. This facility serves 550 students from pre-kindergarten to third grade.

Observed deficiencies primarily consisted of major building systems which have worn out or become obsolete. This facility requires alterations to correct deficiencies in the exterior closure, mechanical system, electrical system and roof, as well as asbestos abatement. It also requires action to address life safety and ADA issues.

Opinions of probable costs are calculated for immedia te 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 life safety fire code requirements, ADA accessibility guidelines and potential major building system failures:

   Total Immediate Remediation Costs $1,365,000

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 $1,716,000

Total remediation project costs are approximately $ 3,081,000.

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 $12,198,000. By comparing the remediation costs, plant re placement 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. Th e ratio for Van Voorhis Elementary School is .49. 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 school be scheduled for renovation within the next year to correct immediate deficiencies and other repairs to major building systems be scheduled within the next ten years. A summary of the MRM calculation is shown below.

ESL(yrs)	AGE (yrs)	RUL (yrs)	PRV ($)	TARGET SUSTAIN. (Annual $)	REMED. COSTS ($)	REQUIRED INVEST. (Annual $)	MRM	RECOMMEND
67	*32.8	*34.2	12,198,000	182,100	3,081,000	90,100	.49	Renovate

* Indicates Composite Number

Old Spencer Boilers

Unsealed Corridor Wall at Roof Deck

WALKER INTERMEDIATE SCHOOL
FORT KNOX, KENTUCKY
PROPERTY CONDITION REPORT
EXECUTIVE SUMMARY

1.0 Executive Summary

Data obtained from the survey provides an objective and impartial evaluation of the Walker Intermediate School for the Department of Defense Edu cation Activity (DoDEA) in their object benefit analysis, to ascertain the feasibility of renovating or replacing facilities.

This facility is a 55,000 square foot, one-story masonry veneer building originally constructed in 1962 with additional construction in 1985, 1987, 1988 and 1997. This facility serves 300 students from fourth to sixth grade.

Observed deficiencies primarily consisted of major building systems which have worn out or become obsolete. This facility requires alterations to correct deficiencies in the mechanical system, plumbing system and roof, as well as some minor asbestos abatement. It also requires action to address life safety and ADA guidelines.

Opinions of probable costs are calculated for immediate and long -term remediation plan ning. 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 life safety fire code requirements, ADA accessibility guidelines and potential major building system failures:

   Total Immediate Remediation Costs $1,395,000

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 $540,000

Total remediation project costs are approximately $ 1,935,000.

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 $8,199,000. 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 Walker Intermediate School is .50. 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 school be scheduled for renovation within the next year to correct immediate deficiencies an d other repairs to major building systems be scheduled within the next ten years. A summary of the MRM calculation is shown below.

ESL(yrs)	AGE (yrs)	RUL (yrs)	PRV ($)	TARGET SUSTAIN. (Annual $)	REMED. COSTS ($)	REQUIRED INVEST. (Annual $)	MRM	RECOMMEND
67	*35.5	*31.5	8,199,000	122,400	1,935,000	61,400	.50	Renovate

* Indicates Composite Number

Cracked Masonry

Damaged Roof

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 these facilities in March and April of 2003. 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-thorough 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-thorough 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.
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.
i. Operating appliances or fixtures.
j. Determining sound transmission coefficient (STC) ratings, flammability issues or regulations.
k. Engineering calculations to determine any system's adequacy or compliance with any specific or commonly accepted design requirements.

l. 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.
m. Identification, damage assessment or remediation recommendations for any type of mold, mildew or algae formations.
n. Additional issues are outlined in ASTM E 2018 Paragraph 11.
o. Force protection. 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 already 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 cost escalation will be required 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 their 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: Fort Knox High School

I	LT	Reference
		3.1 Overall General Description
		This facility is a 121,400 square foot, one story building constructed in 1959. Subsequent additions were: ? Freestanding intramural building in 1985 ? Chiller building in 1986 ? Media center in 1987 ? Freezer building in 1989 ? Vocational annex attached to the original building in 1989 This facility serves 520 students in grades nine through twelve. Total student capacity is 761.
		3.2 Site
		3.2.1 Topography and Storm Water Drainage
X		Slopes away from building appear to provide adequate drainage and the site does not appear to exhibit water-retaining problems, except at the corner of the gym. Corrective action is required. Site storm water drainage is by area drains and underground collection system and surface runoff and does appear to be adequate for water control. No remediation recommended. Roof drainage is by a gutter and downspout system that discharges into an underground storm sewer collection system. The underground system is not visible and is assumed to be in good condition. No remediation recommended.
		3.2.2 Paving, Curbing and Parking
	X	Parking area paving is asphaltic concrete in poor condition. Repair and replacement of damaged parking paving, curbs, gutters, bumpers and pavement marking is recommended. Parking areas appear to provide adequate parking spaces. No remediation recommended.

I	LT	Reference
		3.2.3 Flatwork
	X	Concrete walkways and ramps are in poor condition. Walkways exhibit cracking, spawling, and missing and deteriorated joint sealant. Repair and replacement of damaged walkways is recommended.
	X	Major walkways from drop-off areas and between main building and freestanding classroom and gymnasium buildings are protected by metal covered structures in poor condition. Repair and replacement of damaged areas and refinishing painted surfaces is recommended.
		3.2.4 Recreational Facilities and Title IX Compliance
		Play fields for boy's and girl's field sports are available on-site and are in fair condition. Field facilities include bleachers, concession buildings and toilets. Play field lighting is available and is required. All lighting is in fair condition. Repair of field lighting is recommended. No remediation recommended. Tennis courts are provided and are in poor condition. Repair and replacement of all playing surface areas and equipment is shown in the outdoor athletic facilities report. A gymnasium provides indoor court sport recreational space. The school does sponsor specific team sport programs and does appear to be in compliance with Title IX regulations. No remediation recommended.
		3.2.5 Utilities
		3.2.5.1 Water
		The main service is a 4-inch pipe and enters at the boiler room. Domestic water main service does appear to be adequate and is in good condition. No remediation recommended. A water meter is available and is in good condition. No remediation recommended.
X		A backflow preventer to protect against cross contamination is provided in all service areas except main boiler room. The backflow preventers are in good condition. Provision of a backflow preventer at the main boiler room is required.

I	LT	Reference
		3.2.5.2 Natural Gas
		Gas service is multiple service. Service gas pressure is less than 1 psig in all cases. The natural gas service does appear to be adequate and is in good condition. No remediation recommended.
		3.2.5.3 Sanitary Sewer
	X	Sanitary sewer service does appear to be adequate, but is in fair to poor condition. Staff has reported problems in numerous locations and it is suspected that several sewer laterals may be failing. Repair and replacement of underground piping is required.
		3.2.5.4 Special Utility Systems
		Not applicable.
		3.2.5.5 Electrical Service and Metering
		Electrical service is multiple service and is underground pad mount. The service does appear to be adequate and is in good condition in most locations. No remediation recommended. Electrical service is multiple service located at the main boiler room, the vocational wing addition, the two (2) chiller buildings, the detached gymnasium, and PAPAC. The electrical service at the main boiler room is rated for 1200 amps, 120/208 volts, 3-phase, 4-wire, and is served from a pad mounted transformer. The electrical service at the vocational wing addition is rated for 1000 amps, 277/480 volts, 3-phase, 4-wire, and is served from a pad mounted transformer. Each of the electrical services at the two (2) chiller buildings are rated for 450 amps, 277/480 volts, 3-phase, 4-wire, and are served by separate pad mounted transformers. The electrical service for the detached gymnasium is rated for 600 amps, 120/208 volts, 3-phase, 4-wire, and is served by a pad mounted transformer.
X		The electrical service located at the main boiler room is old and in poor condition. Replacement of this older equipment is recommended.
X		The *National Electrical Code* (NEC) (Article 230-2) limits a single building to a single electrical service. There are exceptions allowed to provide more than one service, but the NEC required specific documented approval of the authority having jurisdiction. Multiple electrical service represent a safety hazard to maintenance personnel and a plaque or sign is required to be provided at each electrical service clearly indicating the locations where the other services to the building are located.

I	LT	Reference
		3.3 Structural Frame and Building Envelope
		3.3.1 Foundation
X		The foundation is assumed to be reinforced concrete grade beams, supported by continuous spread and spot footings with concrete floor slab-on-grade in fair condition. No remediation recommended.
		3.3.2 Building Frame
		Building frame for the main building is reinforced concrete masonry unit shear walls with steel joists. Roof decking is structural metal in the vocational addition and is bulb tees and gypsum. The structural system is in good condition. No remediation recommended. Building frame for the freestanding intramural building is structural steel columns and beams with steel joists and purlins. Roof decking is structural metal. The structural system is in good condition. No remediation recommended.
		3.3.3 Facades or Curtainwall
		3.3.3.1 Sidewall System
X		Building exterior for all buildings except the intramural building is face brick masonry veneer in fair condition. Masonry exhibits surface deterioration, stress cracking, missing and damaged masonry units and grout, deteriorated joint sealant, efflorescence, soiling, staining and algae growth in various locations. Repair and replacement of damaged masonry, grout, joint sealant and surface cleaning is recommended.
	X	Building exterior at the upper gymnasium and vocational annex lobby is exterior insulation and finish system (EIFS) in fair condition. EIFS exhibits surface deterioration, discoloration and soiling. Repair and replacement of damaged areas and general cleaning is recommended.
	X	Building exterior for the intramural building is prefinished metal panels in poor condition. Metal panels exhibit surface deterioration, isolated surface damage, discoloration, soiling, staining and algae growth. Repair and replacement of damaged areas and general cleaning is recommended.
		3.3.3.2 Entrances/Exits
X		Main entrance/exit is pre-finished anodized aluminum doors and framing with glazing in fair condition. Doors do not close properly and interfere with the security system. Corrective action is required.

I	LT	Reference
		Auxiliary exit/entrances are pre-finished anodized aluminum doors and framing with glazing and painted hollow metal doors and frames with glazing in fair condition. Doors do not close properly and interfere with the security system. Corrective action is required.
		3.3.3.3 Fenestration System
		Fenestration system for classroom buildings is pre-finished anodized aluminum framing with untinted double glazing and pre-finished metal spandrel panels in fair condition. No remediation required.
		3.3.3.4 Soffits
		Soffits at main entrance/exit, auxiliary exit/entrances and roof overhangs are pre-finished aluminum in fair condition. No remediation recommended.
		3.3.3.5 Parapets
	X	The vocational annex has parapets that are extensions of the indicated wall systems and are protected with cast stone in fair condition. Repair and replacement of damaged parapets and cast stone coping is recommended.
		3.3.4 Roofing
	X	Low slope modified bitumen is located on the vocational annex and is in fair condition. Leaks are evident. Repair and replacement of damaged areas is recommended.
X		Low slope fully adhered EPDM is located on the original building, media center and chiller buildings and is in poor condition. Leaks are evident. Replacement of the roofing system, including insulation, roofing accessories, metal fascia, gutters and downspouts is recommended.
	X	Sloped pre-finished standing seam metal roofing is located on the intramural building and is in fair condition. Leaks are evident. Repair and replacement of damaged areas is recommended.
	X	Flashing, coping, fascia, gutters and downspouts are pre-finished metal in poor condition. Repair and replacement of damaged areas is recommended.

I	LT	Reference
		3.4 Interior Elements
		3.4.1 Common Areas
		Lobbies and corridors: ? Flooring is vinyl tile and ceramic tile (vocational annex) in poor condition. ? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units and painted concrete masonry units in fair condition. ? Solid ceilings and furring are painted gypsum board in fair condition. ? Suspended acoustical lay-in panel ceilings are in poor condition. Public and private toilets: ? Flooring is ceramic tile in good condition. ? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units and painted concrete masonry units in fair condition. ? Suspended acoustical lay-in panel ceilings are in poor condition. Administrative, media center and classroom areas: ? Flooring is vinyl tile and carpet in poor condition. ? Walls are painted concrete masonry units, painted gypsum board and acoustical wall tile in fair condition. ? Solid ceilings and furring are painted gypsum board in fair condition. ? Suspended acoustical lay-in panel ceilings are in poor condition. Cafeteria: ? Flooring is vinyl tile in poor condition. ? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units in fair condition. ? Solid ceilings and furring are painted gypsum board in fair condition. ? Suspended acoustical lay-in panel ceilings are in poor condition. Gymnasium: ? Flooring is finished wood in poor condition. ? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units in poor condition. ? Glued-on acoustical ceilings are in poor condition.

I	LT	Reference
		Gymnasium toilets and locker rooms: ? Flooring is ceramic tile in fair condition. ? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units in poor condition. ? Solid ceilings and furring are painted plaster in poor condition. Stage: ? Flooring is finished wood in fair condition. ? Walls are painted concrete masonry units in poor condition. ? Glued-on acoustical ceilings are in poor condition. Intramural building: ? Flooring is poured rubber surface in fair condition. ? Walls are painted concrete masonry unit wainscot and prefinished metal wall panels in poor condition. ? Solid ceilings and furring are exposed structure and decking in fair condition. Intramural building toilets and locker rooms: ? Flooring is vinyl tile in poor condition. ? Walls are painted concrete masonry units in poor condition. ? Solid ceilings are painted gypsum board in poor condition. Kitchen: ? Flooring is ceramic tile in fair condition. ? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units in fair condition. ? Solid ceilings and furring are painted plaster in fair condition.
		3.5 Mechanical and Electrical System
		3.5.1 Overall General Description
		The HVAC System for the majority of the school includes rooftop cooling only air handling units served by chilled water. The chilled water serving these rooftop units originates from two chiller buildings, each with interior Trane water chiller and rooftop condenser. Chilled water pumps distribute chilled water to the various chilled water coils on air handling units. Ductwork distributes cool air to the various classrooms. Variable air volume (VAV) boxes serve individual classrooms with separate thermostats. These cooling systems appear to be in good condition.

I	LT	Reference
		Heating is accomplished by means of perimeter unit ventilators and fan & coil units utilizing gas fired heating hot water boilers generated from several different boiler rooms and distributed by multiple zone pumps. The vocational wing addition is served by central station air handling units with chilled water from a packaged air cooled condenser with interior water chiller and heating hot water from boilers. The detached Gymnasium is served by two hot water heating boilers serving a number of suspended heating units. There are supply and exhaust fans for fresh air, but there is no other cooling of the building. These various systems are in fair condition and remediation is not required at this time.
	X	The Band Hall relies on a packaged rooftop air conditioning unit with gas fired furnace. The Spencer boiler at the north boiler room is old and should be replaced. There are two Peerless Model LCD-1G cast iron hot water boilers in the main boiler room, adjacent to the kitchen, one Spencer hot water boiler in the boiler room north end of the school, one Parker hot water boiler in the science building mechanical room, two hot water boilers in the vocational wing and two hot water boilers in the detached gymnasium.
	X	Chillers provide cooling for a majority of the school. Two chiller buildings contain interior Trane chillers with remote roof mounted condensers. The vocational wing has an interior Trane chiller and exterior condenser. The roof mounted condensers, located on the chiller buildings, are showing signs of age and are exhibiting rust. Corrective action is required.
X		Temperatures and various control elements are monitored by the base-wide Johnson Controls "Metasys" system. The existing primary temperature control system is pneumatic and obsolete. A project is underway to convert the controls to DDC, but is not funded yet. Corrective action is required.
		3.5.2 Plumbing System
		3.5.2.1 Plumbing and Waste Piping
	X	Water supply and waste piping appear to be in poor condition in original building. Staff reports constant maintenance problems with leaky pipes. Corrective action is required.
X		The kitchen is not served by a grease trap. Installation of a two-compartment grease trap is required.

I	LT	Reference
		3.5.2.2 Domestic Hot Water Production
X		Domestic hot water is provided by electric and gas-fired water heaters and storage tanks. This system is generally in fair condition. Replacement of one corroded horizontal water heater (Sellers Model B-504) in the main boiler room is required.
		3.5.2.3 Fixtures
	X	Plumbing fixtures and connections appear to be in poor condition. Staff reports continual maintenance problems, particularly in the main building where the fixtures are over 40 years old. Replacement of plumbing fixtures is required.
		3.5.2.4 Fuel Piping
		Natural gas piping is adequate and appears to be in good condition. No remediation recommended.
		3.5.3 Electrical
		3.5.3.1 Main Switchboard
X		The main electrical distribution panel for the main boiler room service is a 200-amp, 120/208-volt, 3-phase, 4-wire panel. The panel does not appear to be adequate and is in poor condition. Corrective action is required. The main electrical distribution panel for the vocational addition is a 1,000-amp, 277/480-volt, 3-phase, 4-wire panel. The panel does appear to be adequate and is in good condition. Corrective action is not required. The main electrical distribution panel for the chiller buildings is a 450-amp, 277/480-volt, 3-phase, 4-wire panel. The panel does appear to be adequate and is in good condition. Corrective action is not required. The main electrical distribution panel for the gymnasium is a 600-amp, 120/208-volt, 3-phase, 4-wire panel. The panel does appear to be adequate and is in good condition. Corrective action is not required.
		3.5.3.2 Distribution and Panels
X		Electrical distribution and branch panels appear to be inadequately sized and are in poor condition. Replacement of supplementation of these panels to meet anticipated electrical demands is recommended.

I	LT	Reference
		3.5.3.3 Interior Lighting
		Typical classroom lighting is surface mounted troffer type fluorescent fixtures. Lamps are T-8 with energy saving ballasts. Light levels appeared to be adequate. Lighting is generally in fair condition and remediation is not required.
	X	Hallway and corridor lighting consists of recessed and surface mounted fluorescent troffers that appear to provide adequate light levels. These lights are generally in fair to poor condition and remediation is required long-term.
		3.5.3.4 Exterior Lighting
	X	Exterior lighting consists of metal halide type wall pack fixtures. These fixtures do not appear to be functioning properly. Light levels on the exterior do not appear to be adequate. Remediation is required.
	X	Soffit and entrance lighting consists of recessed incandescent fixtures in poor condition. Remediation and replacement of these fixtures is recommended.
		Covered canopy light is provided, is fluorescent, and appears to adequate. Remediation is not required.
	X	Parking lot light consists of pole mounted metal halide fixtures in fair condition. Light levels appear to be adequate in all areas except the northeast parking and bus drop-off area. Remediation is required.
		3.5.3.5 Security System
		A security system is provided and is monitored by a central agency. The security system does appear to provide adequate security and is in good condition. Corrective action is not required.
		3.5.3.6 Intercom System
		Intercom system does allow communication to individual classrooms and outside telephone calls. The system is in good condition. Corrective action is not required.
		3.5.3.7 Educational Television
		Educational television is provided and does not allow internal broadcasting. The system is in good condition. Corrective action is not required.

I	LT	Reference
		3.5.3.8 Computer Network
		A computer network system provides adequate LAN outlets for each classroom. The computer network system does appear to be adequate and is in good condition. Corrective action is not required.
		3.6 ADA Tier I: Visual Accessibility Survey
		3.6.1 Path of Travel
X		A marked accessible route from parking is not provided. One accessible route shall be provided from the boundary of the site from public transportation stops, accessible parking spaces, passenger loading zones, public streets or walkways to an accessible building entrance. The accessible route within the facility must comply with minimum widths, clearances, reach requirements, detectable warnings, protrusion protection, changes in elevation, maximum slopes and cross slopes. Provision of complying construction is required. Curb ramps on approaches to the facility from student drop off areas and parking appear to provide accessible slopes. No remediation recommended. Walkway approaches to the main entrance doors appear to provide accessible slopes without threshold entry restrictions. No remediation recommended.
X		Ramps along the on-site accessible route are required and are provided. Ramps do not appear to comply with accessibility guidelines. Required handrails are provided. Handrails do not appear to comply with height and extension requirements. Provision of complying construction is required. Ramps along the interior accessible route are required and are provided. Ramps appear to comply with accessibility guidelines. No remediation recommended.
		3.6.2 Parking
X		Parking does not appear to comply with accessibility guidelines. Parking areas require marked spaces based on 1 accessible space for each 25 spaces, a minimum of one van accessible space for each 8 accessible spaces with slopes not exceeding 1:50 (2%) in all directions, access aisles, signage and marked accessible route. Provision of complying construction is required.

I	LT	Reference
		3.6.3 Entrances/Exits
		Main entrance/exit approach, doors and hardware along the accessible route appear to comply with accessibility guidelines. No remediation recommended.
X		Some auxiliary exit/entrance doors exit to porches that do not appear to provide exiting to accessible walkways or ramps. Provision of accessible exits by construction of new porches, ramps, required handrails or site regrading is required.
X		Some auxiliary exit/entrance doors exit to porches with ramps that do not appear to comply with accessibility guidelines. Required handrails are provided and do not appear to comply with height and extension requirements. Provision of complying construction is required.
X		Interior doors along the accessible route are both inset and flush with corridor walls and do not appear to allow clearance and approach accessibility for each accessible space. At least one door for each accessible space must comply with accessibility guidelines. Provision of complying construction is required.
X		Door assemblies do not appear to meet accessibility guidelines. All doors are required to have adequate maneuvering clearances from either side with adequate width and opening requirements and have non-restrictive hardware. Provision of complying construction is required.
		3.6.4 Signage
	X	Signage along the accessible route does not appear to comply with accessibility guidelines. Signage is required at all designated parking spaces, along the marked accessible route and building interior. Signage with raised Braille characters is required at all doors designating permanent rooms or spaces. Provision of complying construction is required.
		3.6.5 Public Toilet Rooms
X		Public toilets are provided along the accessible route and do not appear to comply with accessibility guidelines. Public toilets are required to provide accessible entry, maneuverability, clear floor space and accessible fixtures, accessories, controls, partitioned stalls and recessed insulated lavatory piping. Provision of complying construction is required.
	X	Administrative staff and nurse's toilets are provided and do not appear to meet accessibility guidelines. Provision of complying construction with guidelines similar to public toilets is recommended.

I	LT	Reference
		3.6.6 Drinking Fountains
X		Drinking fountains are provided along the accessible route and do not appear to comply with accessibility guidelines. Drinking fountains are required to be accessible with adequate clearances and corridor protrusion protection if not recessed into the wall or alcove with more than 4 inches protruding into the accessible route. Provision of complying construction is required.
		3.6.7 Telephones
		Public telephones are not provided along the accessible route. No remediation recommended.
		3.6.8 Elevators/Lifts
	X	A platform/wheelchair lift is not provided at the stage. A platform/wheelchair lift for the stage is required.
		3.6.9 Recreational Facilities
		Play field areas appear to be accessible. No remediation required.
		3.7 Life Safety and Fire Protection
		3.7.1 Sprinklers, Standpipes and Fire Suppression Systems
		A sprinkler system is provided for the vocational addition. Corrective action is not required.
X		A required sprinkler system is not provided for all janitor and custodial spaces. Corrective action is required.
X		A required sprinkler system is not provided for the stage. Corrective action is required.
X		The kitchen hood is exhaust only type. Distance from cooking surfaces and edge of kitchen hood do not appear to comply with distance requirements. Kitchen hood duct protection is not fire resistive construction. The kitchen hood system is in poor condition. Corrective action is required.
X		A required fire suppression system is provided in the kitchen hood. Cooking equipment does have required shut down capability upon suppression system activation. Corrective action is required with hood replacement.

I	LT	Reference
X		Provision of fire extinguishers within required travel distances do not appear to comply with life safety standards. Corrective action is required.
		3.7.2 Alarm Systems
X		The visual alarm system does not appear to comply with ADA guidelines or life safety standards. Visual alarms located 80 inches above the floor to the bottom of the lens are required in all corridors, common use spaces and rooms with more than one occupant. Corrective action is required.
X		A fire alarm panel is provided. It is a Notifier AFP-400 addressable system. A required smoke detector is provided in front of the panel. Corrective action is not required, except to eliminate condensation problems on the sensors. Required pull stations are provided at emergency egress doors and are mounted at heights complying with ADA guidelines. Corrective action is not required.
		3.7.3 Corridor and Separation Walls
X		Exit corridor and area separation walls do not appear to have required firestopping sealing between wall and structural surfaces and framing or around wall penetrations. Borrowed lights do not appear to have fire resistive construction. Ductwork penetrations do not appear to have required fire/smoke dampers. Corrective action is required.
		3.7.4 Doors
		Corridor doors, frames, hardware and assemblies do not appear to comply with life safety fire resistance rating standards. Some doors have louvers that allow the transfer of air between interior spaces and corridors. Corridor doors are required to have fire resistance rated construction and hardware assemblies. Corrective action is required. Refer to Section 3.6 for Opinions of Probable Costs of remediation. Area separation doors, frames, hardware and assemblies appear to comply with fire resistance rated construction requirements. Corrective action is not required. Emergency exit doors, frames, hardware and assemblies appear to comply with emergency exiting requirements. Corrective action is not required.
		3.7.5 Classroom Emergency Exiting
		Operable window units and exit doors to building exterior provide classroom emergency exiting and appear to comply with emergency exiting requirements. Corrective action is not required.

I	LT	Reference
		3.7.6 Emergency Egress Lighting
X		Corridor emergency egress lighting is provided, but is inadequate. Fixtures are wall mounted package units without required testing devices. In some areas, emergency lighting was not observed. Corrective action is required. Illuminated directional emergency exit signs are provided at every required location and are clearly visible. Corrective action is not required.
		3.8 Asbestos Concerns
		According to the AHERA Report, this facility does have asbestos-containing material (ACM). Remaining asbestos-containing material (ACM) is non-friable, not damaged, is inaccessible and is not currently hazardous to building occupants. ACM is located in floor tile and mastic, wall and ceiling tile mastic, mechanical room equipment insulation, and piping and fitting insulation.
	X	Removal of accessible ACM located in areas scheduled for renovation and replacement of affected flooring, ceilings, wall surfaces, piping and equipment insulation is required long-term.

4.0 Opinions of Probable Costs to Remedy Physical Deficiencies (High School)

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 are 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, Intermediate, and Long-term Remediation items are as follows:

Immediate	$ 2,628,000
Intermediate	$ 0
Long-term	$ 2,839,000
Total Remediation Costs	$ 5,467,000

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 $19,702,000. This cost was determined based on the following square foot cost escalated from TM 5-800-4:

$162.39/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 the 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 the High School is a combination of additions and the original 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 Fort Knox High School.

ESL (yrs)	AGE (yrs)	RUL (yrs)	PRV ($)	TARGET SUSTAIN (Annual $)	REMED. COSTS ($)	REQ'D INVEST. (Annual $)	MRM	RECOMMEND
67	*27.8	*39.2	19,702,000	294,100	5,467,000	139,500	.47	Renovate

*Represents Composite Number.

Based on our analysis of the remediation costs, it is our opinion that this school should be renovated to bring it into compliance with applicable codes and repair problems with major building systems.

Refer Appendix for Total Cost Summary

Refer Appendix for Immediate Remediation Item Detail Table

Refer Appendix for Long-Term Remediation Item Detail Table

FORT KNOX HIGH SCHOOL

Photo 1: Sign

Photo 2: Damaged Covered Walk Structures

Photo 3: Replace Old Boiler

Photo 4: Rusting Condensing Unit

Photo 5: Main Electrical Panel Poor Condition

Photo 6: Damaged Masonry

3.0 System Description and Observations: Kingsolver Elementary School

I	LT	Reference
		3.1 Overall General Description
		This facility is a 38,000 square foot, one story building constructed in 1956. The original building was reconstructed after a fire in 1990. Subsequent additions were: ? Classroom Building Pods "B" and "C" and a computer lab were added in 1961. ? Freezer building in 1983 ? Chiller building in 1986 ? Media center in 1987 ? Gymnasium in 1987 ? Storage building in 1989 This facility serves 252 students in grades pre-kindergarten through three. Total student capacity is 210.
		3.2 Site
		3.2.1 Topography and Storm Water Damages
		Slopes away from building appear to provide adequate drainage and the site does not appear to exhibit water-retaining problems. No remediation recommended. Site storm water drainage is by area drains and underground collection system and surface runoff, and does appear to be adequate for water control. No remediation recommended. Roof drainage is by a gutter and downspout system that discharges into an underground storm sewer collection system and onto concrete splash blocks. The underground system is not visible and is assumed to be in good condition. No remediation recommended.
		3.2.2 Paving, Curbing and Parking
	X	Parking area paving is asphaltic concrete in poor condition. Repair and replacement of damaged parking paving, curbs, bumpers and pavement marking is recommended. Parking areas appear to provide adequate parking spaces. No remediation recommended.

I	LT	Reference
		3.2.3 Flatwork
	X	Concrete walkways and ramps are in fair condition. Walkways exhibit cracking, spawling, and missing and deteriorated joint sealant. Repair and replacement of damaged walkways is recommended.
	X	Major walkways between main building and freestanding classroom, media center, and gymnasium buildings are protected by metal and concrete covered structures in poor condition. Repair and replacement of damaged areas and refinishing painted surfaces is recommended.
		3.2.4 Recreational Facilities and Title IX Compliance
	X	A hard surface play area without sports play equipment is provided and is in fair condition. Repair and replacement of damaged surface areas is recommended.
	X	Play areas are provided with various types of equipment in fair condition. Repair and replacement of damaged play equipment is recommended.
	X	Play surfaces include gravel, sand and shredded bark chips in fair condition. Play surfaces appear to comply with the U.S. Consumer Safety Commission "Handbook for Public Playground Safety" requirements. Repair and replacement of damaged play surfaces is recommended. A cafeteria provides indoor court sport recreational and assembly space. The school does not sponsor specific team sport programs and does appear to be in compliance with Title IX regulations. No remediation recommended.
		3.2.5 Utilities
		3.2.5.1 Water
		It is a 2-inch pipe that enters at the mechanical room. Domestic water main service does appear to be adequate and is in fair condition. No remediation recommended.
	X	A water meter is not available. Provision of a water meter is recommended.
X		A backflow preventer to protect against cross contamination is provided. The backflow preventers are in good condition. Provision of a backflow preventer at the mechanical room is required.

I	LT	Reference
		3.2.5.2 Natural Gas
		Gas service is multiple service located at the exterior of the kitchen and outside the gymnasium. The natural gas service does appear to be adequate and is in good condition. No remediation recommended.
		3.2.5.3 Sanitary Sewer
	X	Sanitary sewer service flows to the southwest and does appear to be adequate, but is in poor condition. Several sections of vitrified clay pipe have collapsed in the past. Repair and replacement of underground piping is recommended.
		3.2.5.4 Special Utility Systems
		Not applicable.
		3.2.5.5 Electrical Service and Metering
		Electrical service is multiple service and is underground pad mount. The service does appear to be adequate and is in fair condition. No remediation recommended. Electrical service is multiple service located at the main boiler room, the chiller building, the Media Center, and the gymnasium. The electrical service at the main electrical room, at the east end of the main building, adjacent to Pod "A", is rated for 600 amps, 120/208 volts, 3-phase, 4-wire. The electrical service at the Media Center is rated for 175 amps, 120/208 volts, 3-phase, 4-wire, and is served from a pad mounted transformer. The electrical service at the chiller building is rated for 350 amps, 277/480 volts, 3-phase, 4-wire, and is served by a separate pad mounted transformer. The electrical service for the detached gymnasium is rated for 325 amps (via a 175 amp MCB panel and a 150 amp MCB panel served off a common gutter), 120/208 volts, 3-phase, 4-wire, and is served by a pad mounted transformer.
X		The *National Electrical Code* (NEC) (Article 230-2) limits a single building to a single electrical service. There are exceptions allowed to provide more than one service, but the NEC required specific documented approval of the authority having jurisdiction. Multiple electrical service represent a safety hazard to maintenance personnel and a plaque or sign is required to be provided at each electrical service clearly indicating the locations where the other services to the building are located.

I	LT	Reference
		3.3 Structural Frame and Building Envelope
		3.3.1 Foundation
X		The foundation is assumed to be reinforced concrete grade beams, supported by continuous spread and spot footings with concrete floor slab-on-grade in good to fair condition in most areas. There are some footings around Pod "C" which appear to have settled. Corrective action is required at Pod "C."
		3.3.2 Building Frame
		Building frame for the main building is reinforced concrete masonry unit shear walls with steel joists. Roof decking is bulb tees and gypsum. The structural system is in good condition. No remediation recommended. Building frame for the freestanding media center is wood frame and shear walls with wood joists and trusses. Roof decking is plywood sheathing. The structural system is in good condition. No remediation recommended. Building frame for the freestanding gymnasium is reinforced concrete masonry unit shear walls with steel joists and trusses. Roof decking is structural metal. The structural system is in good condition. No remediation recommended. The existing roofing system on the main building has been covered with a sloped composition shingle roofing system with wood joists and trusses. Decking is plywood sheathing. The structural system is in good condition. No remediation recommended.
		3.3.3 Facades or Curtainwall
		3.3.3.1 Sidewall System
X		Building exterior is face brick masonry veneer in poor condition. Masonry exhibits surface deterioration, stress cracking, missing and damaged masonry units and grout, deteriorated joint sealant, efflorescence, soiling, staining, and algae growth in various locations. Most building corners are exhibiting cracking. Repair and replacement of damaged masonry, grout, joint sealant and surface cleaning is recommended.
		3.3.3.2 Entrances/Exits
		Main entrance/exit is pre-finished anodized aluminum doors and framing with glazing in fair condition. No remediation recommended.

I	LT	Reference
		Auxiliary exit/entrances are pre-finished anodized aluminum doors and framing with glazing and painted hollow metal doors and frames with glazing in fair condition. No remediation recommended.
		3.3.3.3 Fenestration System
		Fenestration system is pre-finished anodized aluminum framing with untinted double glazing and pre-finished metal spandrel panels in fair condition. No remediation recommended.
		3.3.3.4 Soffits
		Soffits at main entrance/exit, auxiliary exit/entrances, and roof overhangs are pre-finished aluminum in fair condition. No remediation recommended.
		3.3.3.5 Parapets
		There are no parapets.
		3.3.4 Roofing
	X	Flat gravel surface built-up roofing is located on the original concrete covered walkways and is in poor condition. Repair and replacement of damaged areas is recommended.
	X	Low slope modified bitumen is located on kitchen area for rooftop mechanical unit and is in fair condition. Leaks are evident. Repair and replacement of damaged areas is recommended.
X	X	Low slope fully adhered EPDM is located on the classroom pod structures and is in fair condition. Leaks are evident. Repair and replacement of damaged areas is required. Patching is required for all roofs. Sloped pre-finished standing seam metal roofing is located on the gymnasium and is in good condition. Leaks are not evident. No remediation recommended.
	X	Sloped composition shingle roofing is located on the media center and freezer building and is in fair condition. Leaks are evident. Repair and replacement of damaged areas is recommended.
	X	The existing roofing system has been covered with a sloped composition shingle roofing system and is in fair condition. Gable ends are covered with pre-finished metal siding in good condition. Leaks are evident. Repair and replacement of damaged areas is recommended.

I	LT	Reference
	X	Flashing, coping, fascia, gutters and downspouts are pre-finished metal in fair condition. Repair and replacement of damaged areas is recommended.
		3.4 Interior Elements
		3.4.1 Common Areas
		Lobbies and corridors: ? Flooring is vinyl tile in fair condition. ? Walls are painted concrete masonry units and painted gypsum board in fair condition. ? Suspended acoustical lay-in panel ceilings are in poor condition. Public, private and classroom toilets: ? Flooring is ceramic tile and vinyl tile in good condition. ? Walls are painted concrete masonry units in fair condition. ? Solid ceilings and furring are painted plaster in fair condition. ? Suspended acoustical lay-in panel ceilings are in fair condition. Administrative, media center and classroom areas: ? Flooring is vinyl tile and carpet in fair condition. ? Walls are painted concrete masonry units and painted gypsum board in poor condition. ? Solid ceilings and furring are painted gypsum board in fair condition. ? Suspended acoustical lay-in panel ceilings are in poor condition. Replacement of all suspended acoustical lay-in panel ceilings is recommended. Cafeteria: ? Flooring is vinyl tile in poor condition. ? Walls are painted concrete masonry units in fair condition. ? Suspended acoustical lay-in panel ceilings are in poor condition. Gymnasium: ? Flooring is poured rubber surface in fair condition. ? Walls are painted concrete masonry units in fair condition. ? Solid ceilings are exposed painted structure and decking in good condition.

I	LT	Reference
		Gymnasium toilets and locker rooms: ? Flooring is poured resinous material in fair condition. ? Walls are painted concrete masonry units in fair condition. ? Solid ceilings are painted gypsum board in fair condition. Stage (being used as teachers' lounge): ? Flooring is finished wood in poor condition. ? Walls are painted concrete masonry units in fair condition. ? Suspended acoustical lay-in panel ceilings are in fair condition. Kitchen: ? Flooring is poured rubber surface in fair condition. ? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units in fair condition. ? Solid ceilings are painted plaster in fair condition.
		3.5 Mechanical and Electrical System
		3.5.1 Overall General Description
		The HVAC System for the majority of the school includes rooftop cooling only air handling units served by chilled water. The chilled water serving these rooftop units originates from the chiller building, with an interior water chiller and rooftop condenser. Chilled water pumps distribute chilled water to the various chilled water coils on air handling units. Ductwork distributes cool air to the various classrooms. The cooling system appears to be in good condition. Heating is accomplished by means of perimeter unit ventilators and fan and coil units utilizing gas fired heating hot water boilers and multiple zone pumps. The Media Center is served by a central air handling unit with two remote condensing units and heating hot water from two small boilers. The Computer Lab is served by a split system air conditioning unit with rooftop condensing unit and interior air handling unit. The detached Gymnasium is served by a hot water heating boiler serving a central suspended air handling unit. The air handling unit can provide a large amount of fresh air to the building, but it does not have the capability to provide cooling. The various systems are in fair condition and remediation is not required at this time. Exhaust fans are provided to vent toilets and some classroom areas.

I	LT	Reference
	X	There is one Cleaver-Brooks Model FLX-700 hot water boiler in the mechanical room that provides heating for a main building and Pod "A". The boiler rooms in Pod "B" and Pod "C" have a Smith Model G300-S cast iron boiler. The Media Center has two small Hydrotherm ORP-385 boilers and the Gymnasium has a small Peerless cast iron hot water boiler. All of the boilers are gas-fired. The Smith boilers in Pod "B" and Pod "C" are old and should be replaced. Chillers provide cooling for a majority of the school. The one chiller building contains an interior chiller with remote roof mounted condensers. The media center and computer lab are served by exterior condensing units.
	X	These roof mounted condensers, located on the chiller building, are showing signs of age and exhibiting rust. The condensing unit on the roof of the Computer Lab is old, is in poor condition and should be replaced.
X		Temperatures and various control elements are monitored by the base-wide Johnson Controls "Metasys" system. The existing primary temperature control system is pneumatic and obsolete. A project is underway to convert the controls to DDC, but is not funded yet. Costs for control replacement are part of the scope of this report.
		3.5.2 Plumbing System
		3.5.2.1 Plumbing Supply and Waste Piping
		Water supply and waste piping appear to be in fair condition. No remediation recommended.
X		The kitchen is not served by a grease trap. Provision of a two-compartment grease trap is required to prevent clogging the sanitary waste system.
		3.5.2.2 Domestic Hot Water Production
		Domestic hot water for the kitchen is provided by 100-gallon, gas-fired water heater. There is another small 40-gallon water heater in the same room that serves non-kitchen areas. Each of the detached buildings on the campus, except for the Media Center, has a separate 30-gallon gas-fired hot water heater. The Media Center is served by a small electric hot water heater.
X		The hot water heater serving the Computer Lab is in poor condition and requires replacement. The overall domestic hot water heating system is generally in fair condition with only the replacement of the single unit at the Computer Lab required.

I	LT	Reference
		3.5.2.3 Fixtures
	X	Plumbing fixtures and connections appear to be in fair condition. Plumbing fixtures in the individual classroom buildings are poor. Replacement of worn fixtures is recommended.
		3.5.2.4 Fuel Piping
		Natural gas piping is adequate and appears to be in good condition. No remediation recommended.
		3.5.3 Electrical System
		3.5.3.1 Main Service
		The main electrical distribution panel for the main boiler room is a 600-amp, 120/208-volt, 3-phase, 4-wire panel. The panel does appear to be adequate and is in good condition. Corrective action is not required. The main electrical distribution panel for the Media Center is a 175-amp, 120/208-volt, 3-phase, 4-wire panel. The panel does appear to be adequate and is in good condition. Corrective action is not required. The main electrical distribution panel for the chiller building is a 350-amp, 277/480-volt, 3-phase, 4-wire panel. The panel does appear to be adequate and is in good condition. Corrective action is not required. The main electrical distribution panel for the Gymnasium is a 325-amp, 120/208-volt, 3-phase, 4-wire panel. The panel does appear to be adequate and is in good condition. Corrective action is not required.
		3.5.3.2 Distribution and Panels
X		Electrical distribution and branch panels appear to be inadequately sized and are in poor condition. Replacement of supplementation of these panels is required.
		3.5.3.3 Interior Lighting
		Typical classroom lighting is surface mounted fluorescent fixtures. Lamps are T-8 with energy saving ballasts. Light levels appeared to be adequate. Lighting is generally good and remediation is not required. Hallway and corridor lighting consists of recessed fluorescent troffers that appear to provide adequate light levels. These lights are generally in good condition and remediation is not required.

I	LT	Reference
		3.5.3.4 Exterior Lighting
	X	Exterior lighting consists of metal halide type wall pack fixtures. Light levels on the exterior do not appear to be adequate. Additional fixtures are required.
	X	Soffit and entrance lighting consists of recessed incandescent fixtures in poor condition. Remediation and replacement of these fixtures is recommended. Covered canopy lighting consists of both fluorescent and metal halide fixtures and appears to be adequate. Remediation is not required.
	X	Parking lot light consists of pole mounted wall pack lighting and other street lighting. Light levels appear to be inadequate. Remediation is required.
		3.5.3.5 Security System
		A security system is provided and is monitored by a central agency. The security system does appear to provide adequate security and is in good condition. Corrective action is not required.
		3.5.3.6 Intercom System
		Intercom system does allow communication to individual classrooms and outside telephone calls. The system is in fair condition. Corrective action is not required.
		3.5.3.7 Educational Television
		Educational television is provided and does not allow internal broadcasting. The system is in good condition. Corrective action is not required.
		3.5.3.8 Computer Network
		A computer network system provides adequate LAN outlets for each classroom. The computer network system does appear to be adequate and is in good condition. Corrective action is not required.
		3.6 ADA Tier I: Visual Accessibility Survey
		3.6.1 Path of Travel
X		A marked accessible route from parking is not provided. One accessible route shall be provided from the boundary of the site from public transportation stops, accessible parking spaces, passenger loading zones, public streets or walkways to an accessible building entrance. The accessible route within the facility must comply with minimum widths, clearances, reach requirements, detectable

I	LT	Reference
		warnings, protrusion protection, changes in elevation, maximum slopes and cross slopes. Provision of complying construction is required.
X		Curb ramps on approaches to the facility from student drop off areas and parking do not appear to provide accessible slopes and/or required textures. Provision of complying construction is required. Walkway approaches to the main entrance doors appear to provide accessible slopes without threshold entry restrictions. No remediation recommended.
		3.6.2 Parking
X		Parking does not appear to comply with accessibility guidelines. Parking areas require marked spaces based on 1 accessible space for each 25 spaces, a minimum of one van accessible space for each 8 accessible spaces with slopes not exceeding 1:50 (2%) in all directions, access aisles, signage and marked accessible route. Provision of complying construction is required.
		3.6.3 Entrances/Exits
		Main entrance/exit approach, doors and hardware appear to comply with accessibility guidelines. No remediation recommended.
	X	Some auxiliary exit/entrance doors exit to porches that do not appear to provide exiting to accessible walkways or ramps. Provision of accessible exits by construction of new porches, ramps, required handrails or site regrading is required.
X		Some auxiliary exit/entrance doors exit to porches with ramps that do not appear to comply with accessibility guidelines. Required handrails are not provided. Provision of complying construction is required.
X		At least one classroom in each wing, including the toilets, must be made accessible. Corrective action is required in the main building and Pods "A," "B" and "C."
X		Interior doors along the accessible route are both inset and flush with corridor walls and do not appear to allow clearance and approach accessibility for each accessible space. At least one door for each accessible space must comply with accessibility guidelines. Provision of complying construction is required.
X		Door assemblies do not appear to meet accessibility guidelines. All doors are required to have adequate maneuvering clearances from either side with adequate width and opening requirements and have non-restrictive hardware. Provision of complying construction is required.

I	LT	Reference
		3.6.4 Signage
	X	Signage along the accessible route does not appear to comply with accessibility guidelines. Signage is required at all designated parking spaces, along the marked accessible route and building interior. Signage with raised Braille characters is required at all doors designating permanent rooms or spaces. Provision of complying construction is required.
		3.6.5 Public Toilet Rooms
X		Public toilets are provided along the accessible route and do not appear to comply with accessibility guidelines. Public toilets are required to provide accessible entry, maneuverability, clear floor space and accessible fixtures, accessories, controls, partitioned stalls and recessed insulated lavatory piping. Provision of complying construction is required.
	X	Administrative staff and nurse's toilets are provided and do not appear to meet accessibility guidelines. Provision of complying construction with guidelines similar to public toilets is recommended.
	X	Classroom toilets are provided and do not appear to meet accessibility guidelines. Provision of complying construction with guidelines similar to public toilets is recommended.
		3.6.6 Drinking Fountains
X		Drinking fountains are provided along the accessible route and do not appear to comply with accessibility guidelines. Drinking fountains are required to be accessible with adequate clearances and corridor protrusion protection if not recessed into the wall or alcove with more than 4 inches protruding into the accessible route. Provision of complying construction is required.
		3.6.7 Telephones
		Public telephones are not provided along the accessible route. No remediation recommended.
		3.6.8 Elevators/Lifts
		Accessible elevators are not required.
	X	A platform/wheelchair lift is not provided at the stage. A platform/wheelchair lift for the stage is required.

I	LT	Reference
		3.6.9 Recreational Facilities
X		Accessible play areas, equipment and surfacing do not appear to be available in individual play area groups. Accessible routes have not been provided. One play area with an accessible route, equipment and accessible surfacing material is required for each play area group.
		3.7 Life Safety and Fire Protection
		3.7.1 Sprinklers, Standpipes and Fire Suppression Systems
X		A required sprinkler system is not provided for all janitor and custodial spaces. Corrective action is required.
X		A required sprinkler system is not provided for the stage. Corrective action is required.
X		The kitchen hood is exhaust only type. Distance from cooking surfaces and edge of kitchen hood do not appear to comply with distance requirements. Kitchen hood duct protection is not fire resistive construction. The kitchen hood system is in poor condition. Corrective action is required.
X		A required fire suppression system is provided in the kitchen hood. Cooking equipment does have required shut down capability upon suppression system activation. Corrective action is required with hood replacement.
X		Provision of fire extinguishers within required travel distances do not appear to comply with life safety standards. Corrective action is required.
		3.7.2 Alarm Systems
X		The visual alarm system does not appear to comply with ADA guidelines or life safety standards. Visual alarms located 80 inches above the floor to the bottom of the lens are required in all corridors, common use spaces and rooms with more than one occupant. Corrective action is required. A fire alarm and annunciator panel is provided. A required smoke detector is provided in front of the panel. Corrective action is not required. Required pull stations are provided at emergency egress doors and are mounted at heights complying with ADA guidelines. Corrective action is not required.

I	LT	Reference
		3.7.3 Corridor and Separation Walls
X		Exit corridor and area separation walls do not appear to have required firestopping sealing between wall and structural surfaces and framing or around wall penetrations. Ductwork penetrations do not appear to have required fire/smoke dampers. Corrective action is required.
		3.7.4 Doors
		Corridor doors, frames, hardware and assemblies do not appear to comply with life safety fire resistance rating standards. Some doors have louvers that allow the transfer of air between interior spaces and corridors. Corridor doors are required to have fire resistance rated construction and hardware assemblies. Corrective action is required. Refer to Section 3.6 for Opinions of Probable Costs of remediation. Emergency exit doors, frames, hardware and assemblies appear to comply with emergency exiting requirements. Corrective action is not required.
		3.7.5 Classroom Emergency Exiting
X		Operable window units and exit doors to building exterior provide classroom emergency exiting and appear to comply with emergency exiting requirements. Corrective action is required, however, to add an additional exit at the media center.
		3.7.6 Emergency Egress Lighting
X		Corridor emergency egress lighting is not provided. Corrective action is required. Additional emergency lighting is also needed at the cafeteria and computer lab. Illuminated directional emergency exit signs are provided at every required location and are clearly visible. Corrective action is not required.
		3.8 Asbestos Concerns
	X	According to the AHERA Report, this facility does have asbestos-containing material (ACM). Remaining asbestos-containing material (ACM) is non-friable, not damaged, is inaccessible and is not currently hazardous to building occupants. ACM is located in floor tile and mastic and wall tile mastic. Removal of accessible ACM located in areas scheduled for renovation and replacement of affected flooring, ceilings, wall surfaces, piping and equipment insulation is required long-term.

4.0 Opinions of Probable Costs to Remedy Physical Deficiencies (Kingsolver Elementary)

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 are 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, Intermediate, and Long-term Remediation items are as follows:

Immediate	$ 1,386,000
Intermediate	$ 0
Long-term	$ 868,000
Total Remediation Costs	$ 2,254,000

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 $5,545,000. This cost was determined based on the following square foot cost escalated from TM 5-800-4:

$145.83/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 the 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 Kingsolver is a combination of additions and the original 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 Kingsolver Elementary School.

ESL (yrs)	AGE (yrs)	RUL (yrs)	PRV ($)	TARGET SUSTAIN (Annual $)	REMED. COSTS ($)	REQ'D INVEST. (Annual $)	MRM	RECOMMEND
67	*32.5	*34.5	5,545,000	82,800	2,254,000	65,300	.79	Renovate

*Represents Composite Number.

Based on our analysis of the remediation costs, it is our opinion that this school should be renovated to bring it into compliance with applicable codes and repair problems with major building systems.

Refer Appendix for Total Cost Summary

Refer Appendix for Immediate Remediation Item Detail Table

Refer Appendix for Long-Term Remediation Item Detail Table

KINGSOLVER ELEMENTARY

Photo 1: Sign

Photo 2: Damaged Masonry

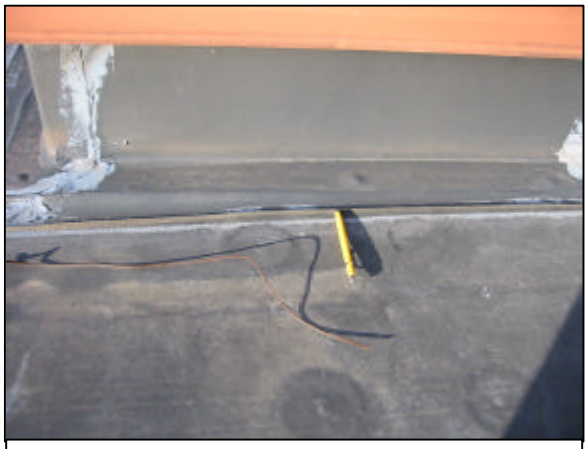


Photo 3: EPDM Flashing Problem

Photo 4: Rusted Condensing Unit on Chiller Roof

Photo 5: Old Electrical Panel

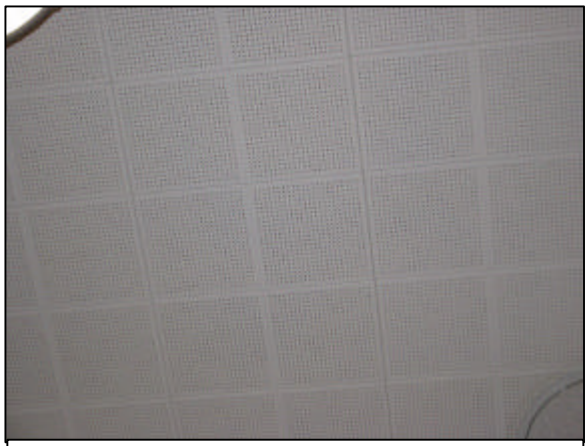


Photo 6: Asbestos Ceiling Tile Mastic

3.0 System Description and Observations: MacDonald Intermediate School

I	LT	Reference
		3.1 Overall General Description
		This facility is a 65,300 square foot, one story building constructed in 1967. Subsequent additions were: ? Storage building in 1989 (not included with instructional area) ? Freezer facility in 1992 This facility serves 350 students in grades four through six. Total student capacity is 414.
		3.2 Site
		3.2.1 Topography and Storm Water Drainage
		Slopes away from building appear to provide adequate drainage and the site does not appear to exhibit water-retaining problems. No remediation recommended. Site storm water drainage is by area drains and underground collection system and surface runoff and does appear to be adequate for water control. No remediation recommended. Roof drainage is by a gutter and downspout system that discharges into an underground storm sewer collection system. The underground system is not visible and is assumed to be in good condition. No remediation recommended.
		3.2.2 Paving, Curbing and Parking
	X	Parking area paving is asphaltic concrete in fair condition. Repair and replacement of damaged parking paving, curbs, and pavement marking is recommended.
	X	Parking areas do not appear to provide adequate parking spaces. Development of additional parking area is recommended.
		3.2.3 Flatwork
	X	Concrete walkways and ramps are in poor condition. Walkways exhibit cracking, spawling, settlement, and missing and deteriorated joint sealant. Replacement of damaged walkways is recommended.
	X	Major walkway from drop off areas and main building is protected by a metal covered structure in fair condition. Repair and replacement of damaged areas and refinishing painted surfaces is recommended.

I	LT	Reference
		3.2.4 Recreational Facilities and Title IX Compliance
	X	A hard surface play area without sports play equipment is provided and is in fair condition. Repair and replacement of damaged surface areas is recommended. A gymnasium provides indoor court sport recreational and assembly space. The school does not sponsor specific team sport programs and does appear to be in compliance with Title IX regulations. No remediation recommended.
		3.2.5 Utilities
		3.2.5.1 Water
X		The main service is a 3-inch pipe that enters the main boiler room. Other service enters at the chiller buildings, detached gym, and at the art wing addition. Domestic water main service does appear to be adequate and is in fair condition. No remediation recommended. A water meter is available and is in fair condition. No remediation recommended. Backflow preventers to protect against cross contamination are provided at all locations except at the main boiler room. The backflow preventers are in good condition. Provision of a backflow preventer at the main boiler room is required.
		3.2.5.2 Natural Gas
		Gas service is multiple service. Service gas pressure is less than 1 psig in all cases. The natural gas service does appear to be adequate and is in good condition. No remediation recommended.
		3.2.5.3 Sanitary Sewer
		Sanitary sewer service does appear to be adequate and is in good condition. No remediation recommended.
		3.2.5.4 Special Utility Systems
		Not applicable.
		3.2.5.5 Electrical Service and Metering
		Electrical service is multiple service and is underground pad mount. The service does appear to be adequate and is in good condition. No remediation recommended.

I	LT	Reference
X		The *National Electrical Code* (NEC) (Article 230-2) limits a single building to a single electrical service. There are exceptions allowed to provide more than one service, but the NEC required specific documented approval of the authority having jurisdiction. Multiple electrical service represent a safety hazard to maintenance personnel and a plaque or sign is required to be provided at each electrical service clearly indicating the locations where the other services to the building are located.
		3.3 Structural Frame and Building Envelope
		3.3.1 Foundation
X		The foundation is assumed to be reinforced concrete grade beams, supported by continuous spread and spot footings with concrete floor slab-on-grade in fair condition. Some isolated areas exhibit spalling and cracking of exposed foundation elements. Staff also reports settling of the gym floor near the exterior walls. Corrective action is required in these areas.
		3.3.2 Building Frame
		Building frame for the main building is reinforced concrete masonry unit shear walls with steel joists. Roof decking is fibrous board. The structural system is in good condition. No remediation recommended. The existing roofing system has been covered with a sloped pre-finished standing seam metal roofing system with steel trusses. Decking is structural metal. The structural system is in good condition. No remediation recommended.
		3.3.3 Facades or Curtainwall
		3.3.3.1 Sidewall System
X		Building exterior is face brick masonry veneer with glazed face brick masonry veneer at windows in poor condition. Masonry exhibits surface deterioration, surface damage from graffiti removal, stress cracking, missing and damaged masonry units and grout, deteriorated joint sealant, efflorescence, soiling and staining in various locations. Repair and replacement of damaged masonry, grout, joint sealant and surface cleaning is required.
		3.3.3.2 Entrances/Exits
		Main entrance/exit is pre-finished anodized aluminum doors and framing with glazing in good condition. No remediation recommended.

I	LT	Reference
		Auxiliary exit/entrances are pre-finished anodized aluminum doors and framing with glazing and painted hollow metal doors and frames with glazing in fair condition. No remediation recommended.
		3.3.3.3 Fenestration System
		Fenestration system is pre-finished anodized aluminum framing with untinted single glazing in fair-to-poor condition. No remediation recommended.
		3.3.3.4 Soffits
		Soffits at main entrance/exit is exposed structure and at auxiliary exit/entrances and roof overhangs are pre-finished aluminum in fair condition. No remediation recommended.
		3.3.3.5 Parapets
		There are no parapets.
		3.3.4 Roofing
	X	Low slope modified bitumen is located on the covered entrance at music and art rooms and is in poor condition. Leaks are evident. Replacement of the roofing system, including insulation, roofing accessories, metal fascia, gutters and downspouts is recommended.
	X	Low slope ballasted EPDM roofing is located on the gymnasium, locker rooms, music and art rooms and is in fair condition. Leaks are evident. Replacement of the roofing system, including insulation, roofing accessories, metal fascia, gutters and downspouts is recommended.
	X	Sloped composition shingle roofing is located on the freezer building and is in fair condition. Leaks are evident. Repair and replacement of damaged areas is recommended.
X		The existing roofing system has been covered with a sloped pre-finished standing seam metal roofing system and is in fair condition. Insulation is sprayed on the bottom of roof deck. Staff report numerous roof leaks. Repair and replacement of damaged areas is required to eliminate areas for moisture intrusion.
	X	Flashing, coping, fascia, gutters and downspouts are pre-finished metal in poor condition. Repair and replacement of damaged areas is recommended. Replacement of all flashing, coping, fascia, gutters and downspouts is required for all areas scheduled for roofing replacement.

I	LT	Reference
		3.4 Interior Elements
		3.4.1 Common Areas Lobbies and corridors: ? Flooring is terrazzo in good condition. ? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units in good condition. ? Metal lockers are provided in the corridors and are not recessed. Lockers are in fair condition. ? Suspended acoustical lay-in panel ceilings are in good condition. Public and private toilets: ? Flooring is ceramic tile in good condition. ? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units in good condition. ? Suspended acoustical lay-in panel ceilings are in good condition. Administrative, media center and classroom areas: ? Flooring is vinyl tile and carpet in good condition. ? Walls are painted concrete masonry units and painted gypsum board in all areas except the music room, which also has some acoustical wall tile in good condition. ? Suspended acoustical lay-in panel ceilings are in good condition. Cafeteria: ? Flooring is vinyl tile in good condition. ? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units in good condition. ? Suspended acoustical lay-in panel ceilings are in good condition. Gymnasium: ? Flooring is finished wood in fair condition. Floor replacement will be required when concrete slab is replaced. ? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units in good condition. ? Solid ceilings are exposed painted structure and decking in good condition.
X		

I	LT	Reference
		Gymnasium toilets and locker rooms: ? Flooring is ceramic tile in fair condition. ? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units in fair condition. ? Solid ceilings are painted plaster in fair condition. Stage: ? Flooring is finished wood in fair condition. ? Walls are painted concrete masonry units and painted gypsum board in fair condition. ? Suspended acoustical lay-in panel ceilings are in poor condition. Kitchen: ? Flooring is ceramic tile in good condition. ? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units in good condition. ? Solid ceilings are painted plaster in good condition. General:
	X	? Replacement of finishes required by other work such as asbestos abatement is included in the scope of this report.
		3.5 Mechanical and Electrical System
		3.5.1 Overall General Description
		The HVAC system for the majority of the school includes geothermal heat pump units, located in the attic of the main school and rooftop geothermal units on the flat roof portion of the school. The circulating geothermal water piping is routed to a grid of exterior wells and to the heat pump units. Both hot and cold are extracted from the circulating water system. An air to air heat exchanger, with heat wheel, provides makeup air to the classrooms. This system is in good condition and remediation is not required. Hot water is supplied by domestic hot water heaters.
X		Exhaust fans are provided to vent toilets and some classroom areas and require replacement due to their condition. Temperatures and various control elements are monitored by the base-wide Johnson controls "Metasys" system. A DDC control system serves the geothermal

I	LT	Reference
		heat pump system.
X		Staff has asked for an indoor air quality study and it is recommended for short-term action to verify system is working properly after repairs are made. The contractor who installed the geothermal system is currently on site trying to correct humidity problems.
		3.5.2 Plumbing System
		3.5.2.1 Plumbing Supply and Waste Piping
X		Water supply and waste piping appear to be in fair condition. Staff reports leaking of some of the geothermal piping. Corrective action is required to repair these leaks.
X		The kitchen is not served by a grease trap. Provision of a two-compartment grease trap is required to prevent kitchen waste from clogging the sanitary system.
		3.5.2.2 Domestic Hot Water Production
		Domestic hot water is provided by a single 300-gallon gas-fired water heater. This system is generally in fair condition. No remediation recommended.
		3.5.2.3 Fixtures
		Plumbing fixtures and connections appear to be in fair condition. Fixtures in the newer areas are in good condition. No remediation recommended.
		3.5.2.4 Fuel Piping
		Natural gas piping is adequate and is in good condition. No remediation recommended.
		3.5.3 Electrical System
		3.5.3.1 Main Service
		One main electrical distribution panel is a 1,200-amp, 277/408 volt, 3-phase, 4-wire panel. The panel appears to be adequate and is in good condition. Corrective action is not required.
X		One main electrical distribution panel is a 1,600-amp, 120/208 volt, 3-phase, 4-wire panel. The panel does appear to be adequate, but is in poor condition. Corrective action is required.

I	LT	Reference
		3.5.3.2 Distribution and Panels
X	X	Electrical distribution and branch panels for the 120/208-volt system appear to be adequately sized, but are in poor condition, and are in good condition for the 277/480-volt system. Replacement of supplementation of these panels to meet anticipated electrical demands is recommended. Rerouting of water lines from above panels is required.
		3.5.3.3 Interior Lighting
		Typical classroom lighting is recessed troffer type fluorescent fixtures. Lamps are T-8 with energy saving ballasts. Light levels appeared to be adequate. Lighting is generally in good condition and remediation is not required. Hallway and corridor lighting consists of recessed fluorescent troffers that appear to provide adequate light levels. These lights are generally in good condition and remediation is not required.
		3.5.3.4 Exterior Lighting
	X	Exterior lighting consists of metal halide type wall pack fixtures. Light levels on the exterior appear to be adequate, but addition of approximately two additional fixtures is recommended.
	X	Soffit, entrance and covered canopy lighting is not provided and provision of lighting is required.
	X	Parking lot light consists of pole mounted metal halide fixtures in fair condition. Light levels appear to be adequate in all areas except the southeast corner. Remediation is required.
		3.5.3.5 Security System
		A security system is provided and is monitored by a central agency. The security system does appear to provide adequate security and is in good condition. Corrective action is not required.
		3.5.3.6 Intercom System
		Intercom system does allow communication to individual classrooms and outside telephone calls. The system is in fair condition. Corrective action is not required.

I	LT	Reference
		3.5.3.7 Educational Television
		Educational television is provided and does not allow internal broadcasting. The system is in good condition. Corrective action is not required.
		3.5.3.8 Computer Network
		A computer network system provides adequate LAN outlets for each classroom. The computer network system does appear to be adequate and is in good condition. Corrective action is not required.
		3.6 ADA Tier I: Visual Accessibility Survey
		3.6.1 Path of Travel
X		A marked accessible route from parking is not provided. One accessible route shall be provided from the boundary of the site from public transportation stops, accessible parking spaces, passenger loading zones, public streets or walkways to an accessible building entrance. The accessible route within the facility must comply with minimum widths, clearances, reach requirements, detectable warnings, protrusion protection, changes in elevation, maximum slopes and cross slopes. Provision of complying construction is required.
X		Curb ramps on approaches to the facility from student drop off areas and parking do not appear to provide accessible slopes and/or required textures. Provision of complying construction is required. Walkway approaches to the main entrance doors appear to provide accessible slopes without threshold entry restrictions. No remediation recommended.
X		Ramps along the on-site accessible route are required and are provided. Ramps do not appear to comply with accessibility guidelines. Required handrails are provided. Handrails do not appear to comply with height and extension requirements. Provision of complying construction is required.
X		Ramps along the interior accessible route are required and are provided. Ramps do not appear to comply with accessibility guidelines. Required handrails are provided. Handrails do not appear to comply with height and extension requirements. Provision of complying construction is required.
X		Steps are provided in corridors along the interior accessible route at elevation changes. Steps do not appear to comply with accessibility guidelines. Required handrails are provided. Handrails do not appear to comply with height and extension requirements. Provision of complying handrail construction is required.

I	LT	Reference
		3.6.2 Parking
X		Parking does not appear to comply with accessibility guidelines. Parking areas require marked spaces based on 1 accessible space for each 25 spaces, a minimum of one van accessible space for each 8 accessible spaces with slopes not exceeding 1:50 (2%) in all directions, access aisles, signage and marked accessible route. Provision of complying construction is required.
		3.6.3 Entrances/Exits
		Main entrance/exit approach, doors and hardware appear to comply with accessibility guidelines. No remediation recommended.
X		Some auxiliary exit/entrance doors exit to porches that do not appear to provide exiting to accessible walkways or ramps. Provision of accessible exits by construction of new porches, ramps, required handrails or site regrading is required.
	X	Some auxiliary exit/entrance doors exit to porches with ramps that do not appear to comply with accessibility guidelines. Required handrails are not provided. Provision of complying construction is required.
X		Interior doors along the accessible route are flush with corridor walls and do not appear to allow clearance and approach accessibility for each accessible space. At least one door for each accessible space must comply with accessibility guidelines. Provision of complying construction is required.
X		Door assemblies do not appear to meet accessibility guidelines. All doors are required to have adequate maneuvering clearances from either side with adequate width and opening requirements and have non-restrictive hardware. Provision of complying construction is required.
		3.6.4 Signage
	X	Signage along the accessible route does not appear to comply with accessibility guidelines. Signage is required at all designated parking spaces, along the marked accessible route and building interior. Signage with raised Braille characters is required at all doors designating permanent rooms or spaces. Provision of complying construction is required.

I	LT	Reference
		3.6.5 Public Toilet Rooms
X		Public toilets are provided along the accessible route and do not appear to comply with accessibility guidelines. Public toilets are required to provide accessible entry, maneuverability, clear floor space and accessible fixtures, accessories, controls, partitioned stalls and recessed insulated lavatory piping. Provision of complying construction is required.
	X	Administrative staff and nurse's toilets are provided and do not appear to meet accessibility guidelines. Provision of complying construction with guidelines similar to public toilets is recommended.
X		Shower facilities for both the girls' and boys' dressing rooms do not appear to be compliant. Corrective action is required.
		3.6.6 Drinking Fountains
X		Drinking fountains are provided along the accessible route and do not appear to comply with accessibility guidelines. Drinking fountains are required to be accessible with adequate clearances and corridor protrusion protection if not recessed into the wall or alcove with more than 4 inches protruding into the accessible route. Provision of complying construction is required.
		3.6.7 Telephones
		Public telephones are not provided along the accessible route. No remediation recommended.
		3.6.8 Elevators/Lifts
		Accessible elevators are not required.
	X	A platform/wheelchair lift is not provided at the stage. A platform/wheelchair lift for the stage is required.
		3.6.9 Recreational Facilities
		Play areas appear to be accessible. No remediation required.
X		There is not accessible seating in the gymnasium. Corrective action is required.

I	LT	Reference
		3.7 Life Safety and Fire Protection
		3.7.1 Sprinklers and Standpipes
		A sprinkler system is provided for the entire facility. Corrective action is not required.
X		The kitchen hood is exhaust only type. Distance from cooking surfaces and edge of kitchen hood do not appear to comply with distance requirements. Kitchen hood duct protection is not fire resistive construction. The kitchen hood system is in poor condition. Corrective action is required.
X		A required fire suppression system is provided in the kitchen hood. Cooking equipment does have required shut down capability upon suppression system activation. Corrective action is required with hood replacement.
X		Provision of fire extinguishers within required travel distances do not appear to comply with life safety standards. Corrective action is required.
		3.7.2 Alarm Systems
X		The visual alarm system does not appear to comply with ADA guidelines or life safety standards. Visual alarms located 80 inches above the floor to the bottom of the lens are required in all corridors, common use spaces and rooms with more than one occupant. Corrective action is required. A fire alarm and annunciator panel is provided. A required smoke detector is provided in front of the panel. Corrective action is not required. Required pull stations are provided at emergency egress doors and are mounted at heights complying with ADA guidelines. Corrective action is not required.
		3.7.3 Corridor and Separation Walls
		Exit corridor and area separation walls appear to have required firestopping sealing between wall and structural surfaces and framing or around wall penetrations. Borrowed lights appear to have fire resistive construction. Ductwork penetrations appear to have required fire/smoke dampers. Corrective action is not required.

I	LT	Reference
		3.7.4 Doors
X		Area separation doors, frames, hardware and assemblies appear to comply with fire resistance rated construction requirements. Corrective action is not required. Emergency exit doors, frames, hardware and assemblies do not appear to comply with emergency exiting requirements. Corrective action is not required.
		3.7.5 Classroom Emergency Exiting
		Operable window units and exit doors to building exterior provide classroom emergency exiting and appear to comply with emergency exiting requirements. Corrective action is not required.
		3.7.6 Emergency Egress Lighting
X X		Corridor emergency egress lighting is not provided. Corrective action is required. Emergency egress lighting is not provided in required windowless rooms. Corrective action is required. Illuminated directional emergency exit signs are provided at every required location and are clearly visible. Corrective action is not required.
		3.8 Asbestos Concerns
	X	According to the AHERA Report, this facility does have asbestos-containing material (ACM). Remaining asbestos-containing material (ACM) is non-friable, not damaged, is inaccessible and is not currently hazardous to building occupants. ACM is located in floor tile and mastic, wall tile mastic, and piping and fitting insulation. Removal of all ACM is required as these finishes and pipes will require replacement in the next ten years.

4.0 Opinions of Probable Costs to Remedy Physical Deficiencies (MacDonald Intermediate)

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 are 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, Intermediate, and Long-term Remediation items are as follows:

Immediate	$ 781,000
Intermediate	$ 200,000
Long-term	$ 1,198,000
Total Remediation Costs	$ 2,179,000

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 $9,739,000. This cost was determined based on the following square foot cost escalated from TM 5-800-4:

$149.15/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 the 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 MacDonald is a combination of additions and the original 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 MacDonald Intermediate School.

ESL (yrs)	AGE (yrs)	RUL (yrs)	PRV ($)	TARGET SUSTAIN (Annual $)	REMED. COSTS ($)	REQ'D INVEST. (Annual $)	MRM	RECOMMEND
67	*34.9	*32.1	9,739,000	145,400	2,179,000	67,900	.47	Renovate

*Represents Composite Number.

Based on our analysis of the remediation costs, it is our opinion that this school should be renovated to bring it into compliance with applicable codes and repair problems with major building systems.

Refer Appendix for Total Cost Summary

Refer Appendix for Immediate Remediation Item Detail Table

Refer Appendix for Long-Term Remediation Item Detail Table

MACDONALD INTERMEDIATE

Photo 1: School Sign

Photo 2: Non-compliant Kitchen Hood

Photo 3: Replace Old Distribution Panels

Photo 4: Repair Damaged Masonry

Photo 5: Non-compliant Urinals

Photo 6: Non-compliant Door Hardware

3.0 System Description and Observations: Mudge Elementary School

I	LT	Reference
		3.1 Overall General Description
		This facility is a 46,400 square foot, one story building constructed in 1961. Subsequent additions were: ? Chiller building in 1986 ? Media center in 1987 ? Storage building in 1989 ? Freezer building in 1997 ? Gymnasium in 1997 This facility serves 330 students in grades pre-kindergarten through three. Total student capacity is 332.
		3.2 Site
		3.2.1 Topography and Storm Water Drainage
		Slopes away from building appear to provide adequate drainage and the site does not appear to exhibit water-retaining problems. No remediation recommended. Site storm water drainage is by area drains, underground collection system, and surface runoff and does appear to be adequate for water control. No remediation recommended.
X		Roof drainage is by a gutter and downspout system that discharges into an underground storm sewer collection system and onto concrete splash blocks. The underground system is not visible and is assumed to be in fair condition, except in the areas around the main entry and outside the nurse's office. This problem requires immediate action.
		3.2.2 Paving, Curbing and Parking
	X	Parking area paving is asphaltic concrete in fair condition. Repair and replacement of damaged parking paving, curbs, and pavement marking is recommended. Parking areas appear to provide adequate parking spaces. No remediation recommended.

I	LT	Reference
		3.2.3 Flatwork
	X	Concrete walkways and ramps are in fair condition. Walkways exhibit cracking, spawling, settlement, and missing and deteriorated joint sealant. Repair and replacement of damaged walkways is recommended.
	X	Major walkways between main building and freestanding classroom, media center, and gymnasium buildings are protected by metal covered structures in poor condition. Repair and replacement of damaged areas, including concrete footings, and refinishing painted surfaces is recommended.
		3.2.4 Recreational Facilities and Title IX Compliance
	X	A hard surface play area, without sports play equipment, is provided and is in fair condition. Repair and replacement of damaged surface areas is recommended.
	X	Play areas are provided with various types of equipment in fair condition. Repair and replacement of damaged play equipment is recommended.
	X	Play surfaces include gravel, sand and shredded bark chips in fair condition. Play surfaces appear to comply with the U.S. Consumer Safety Commission "Handbook for Public Playground Safety" requirements. Repair and replacement of damaged play surfaces is recommended. A gymnasium provides indoor court sport recreational and assembly space. The school does not sponsor specific team sport programs and does appear to be in compliance with Title IX regulations. No remediation recommended.
		3.2.5 Utilities
		3.2.5.1 Water
		A 2-inch water pipe enters the school at the mechanical room by the teachers' lounge. Domestic water main service does appear to be adequate and is in fair condition. No remediation recommended.
	X	A water meter is not available. Provision of a water meter is recommended.
X		Backflow preventers to protect against cross contamination are provided at all locations except at the Mechanical Room. The backflow preventers are in good condition. Provision of a backflow preventer at the Mechanical Room is required.

I	LT	Reference
		3.2.5.2 Natural Gas
		Gas service is multiple service located at the exterior of the kitchen and outside the gymnasium. The natural gas service does appear to be adequate and is in good condition. No remediation recommended.
		3.2.5.3 Sanitary Sewer
	X	Sanitary sewer service does not appear to be adequate and is in poor condition. Staff has reported numerous problems with the vitrified clay pipe collapsing, particularly near the kitchen. Repair and replacement of underground piping is recommended.
		3.2.5.4 Special Utility Systems
		Not applicable.
		3.2.5.5 Electrical Service and Metering
		Electrical service is multiple service and is underground pad mount. The service does appear to be adequate and is in good condition. No remediation recommended.
X		The *National Electrical Code* (NEC) (Article 230-2) limits a single building to a single electrical service. There are exceptions allowed to provide more than one service, but the NEC required specific documented approval of the authority having jurisdiction. Multiple electrical service represent a safety hazard to maintenance personnel and a plaque or sign is required to be provided at each electrical service clearly indicating the locations where the other services to the building are located.
		3.3 Structural Frame and Building Envelope
		3.3.1 Foundation
X		The foundation is assumed to be reinforced concrete grade beams, supported by continuous spread and spot footings with concrete floor slab-on-grade in poor condition. Repair and stabilization of several areas of Pod B and the main building is required.
		3.3.2 Building Frame
		Building frame for the main building is reinforced concrete masonry unit shear walls with steel joists. Roof decking is bulb tees and gypsum. The structural system is in good condition. No remediation recommended.

I	LT	Reference
		Building frame for the freestanding media center is wood frame and shear walls with wood joists and trusses. Roof decking is plywood sheathing. The structural system is in good condition. No remediation recommended. Building frame for the freestanding gymnasium is reinforced concrete masonry unit shear walls with steel joists and trusses. Roof decking is structural metal. The structural system is in good condition. No remediation recommended.
		3.3.3 Facades or Curtainwall
		3.3.3.1 Sidewall System
X		Building exterior is face brick masonry veneer in poor condition. Masonry exhibits surface deterioration, stress cracking, missing and damaged masonry units and grout, deteriorated joint sealant, efflorescence, soiling, staining, and algae growth in various locations. Repair and replacement of damaged masonry, grout, joint sealant and surface cleaning is recommended.
		3.3.3.2 Entrances/Exits
		Main entrance/exit is pre-finished anodized aluminum doors and framing with glazing in fair condition. No remediation recommended. Auxiliary exit/entrances are pre-finished anodized aluminum doors and framing with glazing and painted hollow metal doors and frames with glazing in fair condition. No remediation recommended.
		3.3.3.3 Fenestration System
		Fenestration system is pre-finished anodized aluminum framing with untinted double glazing and pre-finished metal spandrel panels in fair condition. No remediation recommended.
		3.3.3.4 Soffits
		Soffits at main entrance/exit, auxiliary exit/entrances and roof overhangs are pre-finished aluminum in fair condition. No remediation recommended.
		3.3.3.5 Parapets
		There are no parapets.

I	LT	Reference
		3.3.4 Roofing
		Flat gravel surface built-up roofing is located on original concrete covered walkway and is in poor condition. Leaks are evident. Replacement of the roofing system, including roofing accessories, is recommended. (This construction was awarded September 27, 2003. No costs included in this study.) Low slope, fully adhered EPDM is located on all buildings except the media center, freezer building, and gymnasium, and is in poor condition. Leaks are evident. Replacement of the roofing system, including insulation, roofing accessories, metal fascia, gutters and downspouts is recommended. (This construction was awarded September 27, 2003. No costs included in this study.) Sloped pre-finished standing seam metal roofing is located on the gymnasium and is in good condition. Insulation type and thickness could not be determined. Leaks are evident. No remediation recommended. (This construction was awarded September 27, 2003. No costs included in this study.) Sloped composition shingle roofing is located on the media center and freezer building and is in fair condition. Leaks are evident. Repair and replacement of damaged areas is recommended. (This construction was awarded September 27, 2003. No costs included in this study.) Flashing, coping, fascia, gutters and downspouts are pre-finished metal in poor condition. Replacement of all flashing, coping, fascia, gutters and downspouts is recommended for all areas scheduled for roofing replacement. (This construction was awarded September 27, 2003. No costs included in this study.)
		3.4 Interior Elements
		3.4.1 Common Areas
		Lobbies and corridors: ? Flooring is vinyl tile in fair condition. ? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units in fair condition. ? Suspended acoustical lay-in panel ceilings are in poor condition. Public, private and classroom toilets: ? Flooring is ceramic tile and vinyl tile in good condition. ? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units and painted concrete masonry units in fair condition. ? Suspended acoustical lay-in panel ceilings are in poor condition.

I	LT	Reference
		Administrative, media center and classroom areas: ? Flooring is vinyl tile and carpet in poor condition. ? Walls are painted concrete masonry units and painted gypsum board in poor condition. ? Solid ceilings and furring are painted gypsum board in fair condition. ? Suspended acoustical lay-in panel ceilings are in poor condition. Cafeteria: ? Flooring is vinyl tile in poor condition. ? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units in fair condition. ? Suspended acoustical lay-in panel ceilings are in poor condition. Gymnasium: ? Flooring is poured rubber surface in fair condition. ? Walls are painted concrete masonry units in fair condition. ? Solid ceilings are exposed painted structure and decking in good condition. Gymnasium toilets and locker rooms: ? Flooring is poured resinous material in fair condition. ? Walls are painted concrete masonry units in fair condition. ? Solid ceilings are painted gypsum board in fair condition. Stage: ? Flooring is finished wood in fair condition. ? Walls are painted concrete masonry units in fair condition. ? Suspended acoustical lay-in panel ceilings are in fair condition. Kitchen: ? Flooring is ceramic tile in fair condition. ? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units in fair condition. ? Solid ceilings are painted plaster in fair condition.

I	LT	Reference
		General:
	X	? Although replacement of finishes is not normally considered in this study, costs are included for the replacement of finishes affected by other work such as asbestos abatement.
		3.5 Mechanical and Electrical System
		3.5.1 Overall General Description
		The HVAC system for the majority of the school includes rooftop cooling only air handling units served by chilled water. The chilled water serving these rooftop units originates from the Chiller Building, with an interior Trane water chiller and rooftop condenser. Chilled water pumps distribute chilled water to the various chilled water coils on air handling units. Ductwork distributes cool air to the various classrooms. The cooling system appears to be in good condition. Heating is accomplished by means of perimeter unit ventilators and fan and coil units utilizing gas fired heating hot water boilers and distributed by multiple zone pumps. The Media Center is served by a central air handling unit with two remote condensing units and heating hot water from two small boilers. The detached Gymnasium is served by a hot water heating boiler serving a central suspended air handling unit. The air handling unit can provide a large amount of fresh air to the building, but it does not have the capability to provide cooling. The various systems are in fair condition and remediation is not required at this time. Exhaust fans are provided to vent toilets and some classroom areas. There is one Weil-Mclain Model 788 cast iron hot water boiler in the Mechanical Room that provides heating for the Main Building and Pod "A". The boiler rooms in Pods "B," "C" and "D" have a Smith Model G300-S cast iron boiler. The Media Center has two small Hydrotherm GRP-385 boilers and the Gymnasium has a small Peerless model 211 cast iron hot water boiler. All of the boilers are gas fired. The Smith boilers are in fair condition.
	X	The roof mounted Trane condenser, located on the roof of the chiller building, is showing signs of age and exhibiting rust. Corrective action is required.
X		Temperatures and various control elements are monitored by the base-wide Johnson Controls "Metasys" system. The existing primary temperature control system is pneumatic and obsolete. A project is underway to convert the controls to DDC. However, this project is not funded, so costs are shown in this report to

I	LT	Reference
		complete the remediation.
		3.5.2 Plumbing System
		3.5.2.1 Plumbing Supply and Waste Piping
X		Water supply and waste piping within the building appear to be in fair condition. No remediation recommended. The kitchen is not served by a grease trap and installation is required. Provision of a two-compartment grease trap is required.
		3.5.2.2 Domestic Hot Water Production
X		Domestic hot water is provided by gas-fired water heaters and one electric water heater serving the Media Center. The main building and Pod "A" are served by an 86-gallon water heater and the remaining pods have 30-gallon water heaters. This system is generally in fair condition. No remediation recommended, except to provide combustion air at proper heights for the boilers.
		3.5.2.3 Fixtures
	X	Plumbing fixtures and connections appear to be in fair condition in all areas except the individual classroom buildings and the nurse's office. Replacement of these fixtures is required.
		3.5.2.4 Fuel Piping
		Natural gas piping is adequate and is in good condition. No remediation recommended.
		3.5.3 Mechanical System
		3.5.3.1 Main Service
X		The main electrical distribution panel for the main electrical room is an 800-amp, 120/208-volt, 3-phase, 4-wire panel. The panel is marginally adequate to meet demand, but is in poor condition. Corrective action is required. The main electrical distribution panel for the media center is a 175-amp, 120/208-volt, 3-phase, 4-wire panel. The panel does appear to be adequate and is in good condition. Corrective action is not required. The main electrical distribution panel for the chiller building is a 450-amp, 277/480-volt, 3-phase, 4-wire panel. The panel does appear to be adequate and is in

I	LT	Reference
		good condition. Corrective action is not required. The main electrical distribution panel for the gymnasium is a 325-amp, 120/208-volt, 3-phase, 4-wire panel. The panel does appear to be adequate and is in good condition. Corrective action is not required.
		3.5.3.2 Distribution and Panels
	X	Electrical distribution and branch panels appear to be adequately sized and are in poor condition. Replacement of supplementation of these panels to meet anticipated electrical demands is recommended.
		3.5.3.3 Interior Lighting
	X	Typical classroom lighting in the main building is surface mounted fluorescent fixtures. Lamps are T-12. Light levels appear to be inadequate and remediation is required. Light fixtures in the newer additions are recessed troffer fluorescent fixtures with T-8 lamps in good condition. Light levels appear to be adequate. No remediation recommended. Hall and corridor lighting consists of recessed fluorescent troffers that appear to provide adequate light levels. These lights are generally in good condition and remediation is not required.
		3.5.3.4 Exterior Lighting
	X X X	Exterior lighting around the school consists of metal halide type wall pack fixtures. Light levels on the exterior do not appear to be adequate. Remediation is required. Soffit and entrance lighting consists of recessed incandescent fixtures in poor condition. Remediation and replacement of these fixtures is recommended. Covered canopy light is provided and is both fluorescent and metal halide fixtures. Lighting appears to be adequate and remediation is not required. Parking lot light relies on building wall panels of pole mounted metal halide fixtures. Light levels appear to be inadequate. Remediation is required.
		3.5.3.5 Security System
		A security system is provided and is monitored by a central agency. The security system does appear to provide adequate security and is in good condition. Corrective action is not required.

I	LT	Reference
		3.5.3.6 Intercom System
X		Intercom system does allow communication to individual classrooms and outside telephone calls. The system is in fair condition, although staff has reported problems with some phone lines not working consistently. Corrective action is required to repair these lines.
		3.5.3.7 Educational Television
		Educational television is provided and does not allow internal broadcasting. The system is in good condition. Corrective action is not required.
		3.5.3.8 Computer Network
		A computer network system provides adequate LAN outlets for each classroom. The computer network system does appear to be adequate and is in good condition. Corrective action is not required.
		3.6 ADA Tier I: Visual Accessibility Survey
		3.6.1 Path of Travel
X		A marked accessible route from parking is not provided. One accessible route shall be provided from the boundary of the site from public transportation stops, accessible parking spaces, passenger loading zones, public streets or walkways to an accessible building entrance. The accessible route within the facility must comply with minimum widths, clearances, reach requirements, detectable warnings, protrusion protection, changes in elevation, maximum slopes and cross slopes. Provision of complying construction is required.
	X	Curb ramps on approaches to the facility from student drop off areas and parking do not appear to provide accessible slopes and/or required textures. Provision of complying construction is required. Walkway approaches to the main entrance doors appear to provide accessible slopes without threshold entry restrictions. No remediation recommended.
X		Ramps along the on-site accessible route are required and are provided. Ramps do not appear to comply with accessibility guidelines. Required handrails are provided. Handrails do not appear to comply with height and extension requirements. Provision of complying construction is required.

I	LT	Reference
		3.6.2 Parking
X		Parking does not appear to comply with accessibility guidelines. Parking areas require marked spaces based on 1 accessible space for each 25 spaces, a minimum of one van accessible space for each 8 accessible spaces with slopes not exceeding 1:50 (2%) in all directions, access aisles, signage and marked accessible route. Provision of complying construction is required.
		3.6.3 Entrances/Exits
		Main entrance/exit approach, doors and hardware appear to comply with accessibility guidelines. No remediation recommended.
	X	Some auxiliary exit/entrance doors exit to porches that do not appear to provide exiting to accessible walkways or ramps. Provision of accessible exits by construction of new porches, ramps, required handrails or site regrading is required.
X		Interior doors along the accessible route are both inset and flush with corridor walls and do not appear to allow clearance and approach accessibility for each accessible space. At least one door for each accessible space must comply with accessibility guidelines. Provision of complying construction is required.
X		Door assemblies do not appear to meet accessibility guidelines. All doors are required to have adequate maneuvering clearances from either side with adequate width and opening requirements and have non-restrictive hardware. Provision of complying construction is required.
		3.6.4 Signage
	X	Signage along the accessible route does not appear to comply with accessibility guidelines. Signage is required at all designated parking spaces, along the marked accessible route and building interior. Signage with raised Braille characters is required at all doors designating permanent rooms or spaces. Provision of complying construction is required.
		3.6.5 Public Toilet Rooms
X		Public toilets are provided along the accessible route and do not appear to comply with accessibility guidelines. Public toilets are required to provide accessible entry, maneuverability, clear floor space and accessible fixtures, accessories, controls, partitioned stalls and recessed insulated lavatory piping. Provision of complying construction is required.

I	LT	Reference
	X	Administrative staff and nurse's toilets are provided and do not appear to meet accessibility guidelines. Provision of complying construction with guidelines similar to public toilets is recommended.
	X	Classroom toilets are provided and do not appear to meet accessibility guidelines. Provision of complying construction with guidelines similar to public toilets is recommended.
		3.6.6 Drinking Fountains
X		Drinking fountains are provided along the accessible route and do not appear to comply with accessibility guidelines. Drinking fountains are required to be accessible with adequate clearances and corridor protrusion protection if not recessed into the wall or alcove with more than 4 inches protruding into the accessible route. Provision of complying construction is required.
		3.6.7 Telephones
		Public telephones are not provided along the accessible route. No remediation recommended.
		3.6.8 Elevators/Lifts
		Accessible elevators are not required.
	X	A platform/wheelchair lift is not provided at the stage. A platform/wheelchair lift for the stage is required.
		3.6.9 Recreational Facilities
X		Accessible play areas, equipment and surfacing do not appear to be available in individual play area groups. Accessible routes have not been provided. One play area with an accessible route, equipment and accessible surfacing material is required for each play area group.
		3.7 Life Safety and Fire Protection
		3.7.1 Sprinklers, Standpipes and Fire Suppression Systems
X		A required sprinkler system is not provided for all janitor and custodial spaces. Corrective action is required.
X		A required sprinkler system is not provided for the stage. Corrective action is required.

I	LT	Reference
X		The kitchen hood is exhaust only type. Distance from cooking surfaces and edge of kitchen hood do not appear to comply with distance requirements. Kitchen hood duct protection is not fire resistive construction. The kitchen hood system is in poor condition. Corrective action is required.
X		A required fire suppression system is provided in the kitchen hood. Cooking equipment does have required shut down capability upon suppression system activation. Corrective action is required with hood replacement.
X		Provision of fire extinguishers within required travel distances do not appear to comply with life safety standards. Corrective action is required.
		3.7.2 Alarm Systems
X		The visual alarm system does not appear to comply with ADA guidelines or life safety standards. Visual alarms located 80 inches above the floor to the bottom of the lens are required in all corridors, common use spaces and rooms with more than one occupant. Corrective action is required.
		A fire alarm and annunciator panel is provided. A required smoke detector is provided in front of the panel. Corrective action is not required.
X		Required pull stations are provided at emergency egress doors and are not mounted at heights complying with ADA guidelines. Corrective action is required.
		3.7.3 Corridor and Separation Walls
X		Exit corridor and area separation walls do not appear to have required firestopping sealing between wall and structural surfaces and framing or around wall penetrations. Borrowed lights do not appear to have fire resistive construction. Ductwork penetrations do not appear to have required fire/smoke dampers. Corrective action is required.
		3.7.4 Doors
		Corridor doors, frames, hardware and assemblies do not appear to comply with life safety fire resistance rating standards. Some doors have louvers that allow the transfer of air between interior spaces and corridors. Corridor doors are required to have fire resistance rated construction and hardware assemblies. Corrective action is required. Refer to Section 3.6 for Opinions of Probable Costs of remediation.
		Emergency exit doors, frames, hardware and assemblies appear to comply with emergency exiting requirements. Corrective action is not required.

I	LT	Reference
		3.7.5 Classroom Emergency Exiting
		Operable window units and exit doors to building exterior provide classroom emergency exiting and appear to comply with emergency exiting requirements. Corrective action is not required.
		3.7.6 Emergency Egress Lighting
X		Corridor emergency egress lighting is not provided. Corrective action is required. Illuminated directional emergency exit signs are provided at every required location and are clearly visible. Corrective action is not required.
		3.8 Asbestos Concerns
		According to the AHERA Report, this facility does have asbestos-containing material (ACM). Remaining asbestos-containing material (ACM) is non-friable, not damaged, is inaccessible and is not currently hazardous to building occupants. ACM is located in floor tile and mastic and transite panels and ceiling mastic.
	X	Removal of all ACM is required long-term.

4.0 Opinions of Probable Costs to Remedy Physical Deficiencies (Mudge Elementary)

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 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 are 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, Intermediate, and Long-term Remediation items are as follows:

Immediate	$ 1,082,000
Intermediate	$ 25,000
Long-term	$ 1,220,000
Total Remediation Costs	$ 2,327,000

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 $6,766,000. This cost was determined based on the following square foot cost escalated from TM 5-800-4:

$145.83/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 the 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 Mudge is a combination of additions and the original 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 Mudge Elementary School.

ESL (yrs)	AGE (yrs)	RUL (yrs)	PRV ($)	TARGET SUSTAIN (Annual $)	REMED. COSTS ($)	REQ'D INVEST. (Annual $)	MRM	RECOMMEND
67	*32.9	*34.1	6,766,000	101,000	2,327,000	68,200	.68	Renovate

*Represents Composite Number.

Based on our analysis of the remediation costs, it is our opinion that this school should be renovated to bring it into compliance with applicable codes and repair problems with major building systems.

Refer Appendix for Total Cost Summary

Refer Appendix for Immediate Remediation Item Detail Table

Refer Appendix for Long-Term Remediation Item Detail Table

MUDGE ELEMENTARY

Photo 1: School Sign

Photo 2: Poor Lights and Ceiling

Photo 3: Foundation Settlement

Photo 4: Condensing Unit in Poor Condition

Photo 5: Non-compliant Toilet Room

Photo 6: ACM Mastic Behind Ceiling Tile

3.0 System Description and Observations: Pierce Elementary School

I	LT	Reference
		3.1 Overall General Description
		This facility is a 48,300 square foot, one story building constructed in 1959. Subsequent additions were: ? Chiller building in 1986 ? Media Center in 1987 ? Gymnasium in 1997 ? Freezer Building in 1998 This facility serves 353 students in grades pre-kindergarten through three. Total student capacity is 290.
		3.2 Site
		3.2.1 Topography and Storm Water Drainage
	X	Slopes away from building do not appear to provide adequate drainage and the site does appear to exhibit water-retaining problems in some areas. Corrective site grading to improve drainage is recommended. Site storm water drainage is by area drain, underground collection system, and surface runoff and does appear to be adequate for water control. No remediation recommended.
		3.2.2 Paving, Curbing and Parking
	X	Parking area paving is asphaltic concrete. Paving, curbing and parking is in poor condition. Repair and replacement of all parking paving, curbs, gutters, bumpers and pavement marking is recommended.
	X	Parking areas do not appear to provide adequate parking spaces. Development of additional parking area is recommended.
		3.2.3 Flatwork
	X	Concrete walkways and ramps are in poor condition. Walkways exhibit cracking, spawling, settlement, and missing and deteriorated joint sealant. Repair and replacement of damaged walkways is recommended.
	X	Major walkways between main building and freestanding classroom, media center and gymnasium buildings are protected by metal covered structures in poor

I	LT	Reference
		condition. Repair and replacement of damaged areas and refinishing painted surfaces is recommended.
		3.2.4 Recreational Facilities and Title IX Compliance
	X	A hard surface play area without sports play equipment is provided and is in fair condition. Repair and replacement of damaged surface areas is recommended.
	X	Play areas are provided with various types of equipment in fair condition. Repair and replacement of damaged play equipment is recommended.
	X	Play surfaces include gravel, sand and shredded bark chips in fair condition. Play surfaces appear to comply with the U.S. Consumer Safety Commission "Handbook for Public Playground Safety" requirements. Repair and replacement of damaged play surfaces is recommended. A cafeteria/gymnasium and gymnasium provide indoor court sport recreational and assembly space. The school does not sponsor specific team sport programs and does appear to be in compliance with Title IX regulations. No remediation recommended.
		3.2.5 Utilities
		3.2.5.1 Water
		Domestic water main service does appear to be adequate and is in fair condition. No remediation recommended.
	X	A water meter is not available. Provision of a water meter may be required for individual facility service metering.
X		Backflow preventers to protect against cross contamination are provided at all areas except the mechanical room. The backflow preventers are in good condition. Provision of a backflow preventer at the mechanical room is required.
		3.2.5.2 Natural Gas
		Gas service is multiple service. The natural gas service does appear to be adequate and is in good condition. No remediation recommended.

I	LT	Reference
		3.2.5.3 Sanitary Sewer
		Sanitary sewer service does appear to be adequate and is in fair condition. No remediation recommended. Roof drainage is by a gutter and downspout system that discharges into an underground storm sewer collection system and onto concrete splash blocks. The underground system is not visible and is assumed to be in good condition. No remediation recommended.
		3.2.5.4 Special Utility Systems
		Not applicable.
		3.2.5.5 Electrical Service and Metering
X		Electrical service is single service and is underground pad mount. The service does appear to be adequate and is in good condition. No remediation recommended. The *National Electrical Code* (NEC) (Article 230-2) limits a single building to a single electrical service. There are exceptions allowed to provide more than one service, but the NEC required specific documented approval of the authority having jurisdiction. Multiple electrical service represent a safety hazard to maintenance personnel and a plaque or sign is required to be provided at each electrical service clearly indicating the locations where the other services to the building are located.
		3.3 Structural Frame and Building Envelope
		3.3.1 Foundation
X		The foundation is assumed to be reinforced concrete grade beams, supported by continuous spread and spot footings with concrete floor slab-on-grade in fair condition. No remediation recommended, except at Pod "C," where there has been some damage caused by settlement.
		3.3.2 Building Frame
		Building frame for the main building is reinforced concrete masonry unit shear walls in the original building and individual classroom buildings with steel joists. Roof decking is bulb tees and gypsum. The structural system is in good condition. No remediation recommended. Building frame for the freestanding media center is wood frame and shear walls with wood joists and trusses. Roof decking is plywood sheathing. The structural

I	LT	Reference
		system is in good condition. No remediation recommended. Building frame for the freestanding gymnasium is structural steel columns and beams with steel joists and trusses. Roof decking is metal. The structural system is in good condition. No remediation recommended.
		3.3.3 Facades or Curtainwall
		3.3.3.1 Sidewall System
X		Building exterior is face brick masonry veneer in fair condition. Masonry exhibits surface deterioration, stress cracking, missing and damaged masonry units and grout, deteriorated joint sealant, efflorescence, soiling, staining and algae growth in various locations. Repair and replacement of damaged masonry, grout, joint sealant and surface cleaning is recommended.
		3.3.3.2 Entrances/Exits
		Main entrance/exit is pre-finished anodized aluminum doors and framing with glazing in good condition. No remediation recommended. Auxiliary exit/entrances are pre-finished anodized aluminum doors and framing with glazing and painted hollow metal doors and frames with glazing in fair condition. No remediation recommended.
		3.3.3.3 Fenestration System
		Fenestration system is pre-finished anodized aluminum framing with untinted double glazing and pre-finished metal spandrel panels in fair condition. No remediation recommended.
		3.3.3.4 Soffits
		Soffits at main entrance/exit, auxiliary exit/entrances and roof overhangs are pre-finished aluminum in fair condition. No remediation recommended.
		3.3.3.5 Parapets
		There are no parapets.

I	LT	Reference
		3.3.4 Roofing
	X	Low slope ballasted EPDM roofing is located on the original building and is in fair condition. Leaks are evident. Repair and replacement of damaged areas is recommended. Sloped pre-finished standing seam metal roofing is located on the gymnasium and is in good condition. Leaks are not evident. No remediation recommended.
	X	Sloped composition shingle roofing is located on the media center and is in fair condition. Leaks are evident. Repair and replacement of damaged areas is recommended.
	X	Flashing, coping, fascia, gutters and downspouts are pre-finished metal in fair condition. Repair and replacement of damaged areas is recommended.
		3.4 Interior Elements
		3.4.1 Common Areas
		Lobbies and corridors: ? Flooring is vinyl tile in poor condition. ? Walls are glazed concrete masonry unit wainscot, painted concrete masonry units, and painted gypsum board in fair condition. ? Suspended acoustical lay-in panel ceilings are in poor condition. Public and classroom toilets: ? Flooring is ceramic tile in good condition. ? Walls are glazed concrete masonry unit wainscot, painted concrete masonry units, and painted concrete masonry units in fair condition. ? Suspended acoustical lay-in panel ceilings are in poor condition. Administrative, media center and classroom areas: ? Flooring is vinyl tile and carpet in poor condition. ? Walls are painted concrete masonry units and painted gypsum board in fair condition. ? Solid ceilings and furring are painted gypsum board in fair condition. ? Suspended acoustical lay-in panel ceilings are in poor condition.

I	LT	Reference
		Cafeteria/gymnasium: ? Flooring is vinyl tile in poor condition. ? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units in fair condition. ? Suspended acoustical lay-in panel ceilings are in poor condition. Gymnasium: ? Flooring is poured rubber surface in good condition. ? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units in fair condition. ? Solid ceilings are exposed painted structure and decking in good condition. Gymnasium toilets and locker rooms: ? Flooring is poured resinous material in fair condition. ? Walls are painted concrete masonry units in fair condition. ? Solid ceilings are painted gypsum board in fair condition. Stage: ? Flooring is finished wood in poor condition. ? Walls are painted concrete masonry units in poor condition. ? Suspended acoustical lay-in panel ceilings are in poor condition. Kitchen: ? Flooring is ceramic tile in good condition. ? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units in fair condition. ? Solid ceilings and furring are painted plaster in fair condition. General:
	X	? Corrective action is required to replace finishes affected in removal of asbestos containing materials.

I	LT	Reference
		3.5 Mechanical and Electrical System
		3.5.1 Overall General Description
		The HVAC system for the majority of the school includes rooftop cooling only air handling units served by chilled water. The chilled water serving these rooftop units originates from the chiller building, with an interior Trane water chiller and rooftop condenser. Chilled water pumps distribute chilled water to the various chilled water coils on air handling units. Ductwork distributes cool air to the various classrooms. The cooling system appears to be in good condition. Heating is accomplished by means of perimeter unit ventilators and fan and coil units utilizing gas fired heating hot water boilers and distributed by multiple zone pumps. The media center is served by a central air handling unit with two remote condensing units and heating hot water from two small boilers. The detached gymnasium is served by a hot water heating boiler serving a central suspended air handling unit. The air handling unit can provide a large amount of fresh air to the building, but it does not have the capability to provide cooling. The various systems are in fair condition and remediation is not required at this time. Hot water is supplied by domestic hot water heaters. Exhaust fans are provided to vent toilets and some classroom areas. There is one Peerless Model 211A cast iron hot water boiler in the mechanical room that provides heating for the main building. The boiler rooms in Pods "A," "B" and "C" have a Smith Model G300-S cast iron boiler. The media center has two small Hydrotherm GRP-385 boilers and the gymnasium has a small Peerless Model 211 cast iron hot water boiler. All of the boilers are gas fired. The Smith boilers are in fair condition. Chillers provide cooling for a majority of the school. The one chiller building contains an interior Trane chiller with remote roof mounted condensers. The media center is served by exterior condensing units.
	X	The roof mounted Trane condenser, located on the chiller building, is showing signs of age and exhibiting rust. Corrective action is required.
X		Temperatures and various control elements are monitored by the base-wide Johnson Controls "Metasys" system. The existing primary temperature control system is pneumatic and obsolete. A project is underway to convert these pneumatic controls to DDC, but is not funded. Therefore, costs for controls replacement are included in this report.

I	LT	Reference
		3.5.2 Plumbing System
		3.5.2.1 Plumbing Supply and Waste Piping
X		Water supply and waste piping appear to be in fair condition. No remediation recommended. The kitchen is not served by a grease trap. Provision of a two-compartment grease trap is required.
		3.5.2.2 Domestic Hot Water Production
X		Domestic hot water is provided by gas-fired water heaters. This system is generally in fair condition. One water heater requires immediate replacement.
		3.5.2.3 Fixtures
	X	Plumbing fixtures and connections appear to be in fair condition in all areas except individual classroom buildings. Replacement of these fixtures is recommended.
		3.5.2.4 Fuel Piping
		Natural gas piping is adequate and is in good condition. No remediation recommended.
		3.5.3 Electrical
		3.5.3.1 Main Service
X		The main electrical distribution panel for the main electrical room is a 700-amp, 120/208-volt, 3-phase, 4-wire panel. The panel does not appear to be adequate and is in fair condition. Corrective action is required. The main electrical distribution panel for the media center is a 175-amp, 120/208-volt, 3-phase, 4-wire panel. The panel does appear to be adequate and is in good condition. Corrective action is not required. The main electrical distribution panel for the chiller building is a 450-amp, 277/480-volt, 3-phase, 4-wire panel. The panel does appear to be adequate and is in good condition. Corrective action is not required. The main electrical distribution panel for the gymnasium is a 150-amp, 120/208-volt, 3-phase, 4-wire panel. The panel does appear to be adequate and is in good condition. Corrective action is not required.

I	LT	Reference
		3.5.3.2 Distribution and Panels
	X	Electrical distribution and branch panels appear to be inadequately sized and are in poor condition. Replacement of supplementation of these panels to meet anticipated electrical demands is recommended.
		3.5.3.3 Interior Lighting
		Typical classroom lighting is surface mounted or recessed troffer fluorescent fixtures. Lamps are T-8 with energy saving ballasts. Light levels appeared to be adequate. Lighting is generally in good condition and remediation is not required. Hallway and corridor lighting consists of recessed fluorescent fixtures that appear to provide adequate light levels. These lights are generally in good condition and remediation is not required.
		3.5.3.4 Exterior Lighting
	X	Exterior lighting consists of metal halide type wall pack fixtures. Light levels on the exterior do not appear to be adequate. Remediation is required.
	X	Soffit and entrance lighting consists of recessed incandescent fixtures in poor condition. Remediation and replacement of these fixtures is recommended. Covered canopy light consists of fluorescent and metal halide fixtures. Lighting appears to be adequate and remediation is not required.
	X	Parking lot light relies on wall pack on building. Light levels appear to be inadequate. Remediation is required.
		3.5.3.5 Security System
		A security system is provided and is monitored by a central agency. The security system does appear to provide adequate security and is in good condition. Corrective action is not required.
		3.5.3.6 Intercom System
		Intercom system does allow communication to individual classrooms and outside telephone calls. The system is in fair condition. Corrective action is not required.

I	LT	Reference
		3.5.3.7 Educational Television
		Educational television is provided and does not allow internal broadcasting. The system is in good condition. Corrective action is not required.
		3.5.3.8 Computer Network
		A computer network system provides adequate LAN outlets for each classroom. The computer network system does appear to be adequate and is in good condition. Corrective action is not required.
		3.6 ADA Tier I: Visual Accessibility Survey
		3.6.1 Path of Travel
X		A marked accessible route from parking is not provided. One accessible route shall be provided from the boundary of the site from public transportation stops, accessible parking spaces, passenger loading zones, public streets or walkways to an accessible building entrance. The accessible route within the facility must comply with minimum widths, clearances, reach requirements, detectable warnings, protrusion protection, changes in elevation, maximum slopes and cross slopes. Provision of complying construction is required.
X		Curb ramps on approaches to the facility from student drop off areas and parking do not appear to provide accessible slopes and/or required textures. Provision of complying construction is required. Walkway approaches to the main entrance doors appear to provide accessible slopes without threshold entry restrictions. No remediation recommended.
X		Ramps along the on-site accessible route are required and are provided. Ramps do not appear to comply with accessibility guidelines. Required handrails are provided. Handrails do not appear to comply with height and extension requirements. Provision of complying construction is required.
		3.6.2 Parking
X		Parking does not appear to comply with accessibility guidelines. Parking areas require marked spaces based on 1 accessible space for each 25 spaces, a minimum of one van accessible space for each 8 accessible spaces with slopes not exceeding 1:50 (2%) in all directions, access aisles, signage and marked accessible route. Provision of complying construction is required.

I	LT	Reference
		3.6.3 Entrances/Exits
		Main entrance/exit approach, doors and hardware along the accessible route appear to comply with accessibility guidelines. No remediation recommended.
	X	Some auxiliary exit/entrance doors exit to porches that do not appear to provide exiting to accessible walkways or ramps. Provision of accessible exits by construction of new porches, ramps, required handrails or site regrading is required.
	X	Some auxiliary exit/entrance doors exit to porches with ramps that do not appear to comply with accessibility guidelines. Handrails are not provided. Provision of complying construction is required.
X		Interior doors along the accessible route are both inset and flush with corridor wall and do not appear to allow clearance and approach accessibility for each accessible space. At least one door for each accessible space must comply with accessibility guidelines. Provision of complying construction is required.
X		Door assemblies do not appear to meet accessibility guidelines. All doors are required to have adequate maneuvering clearances from either side with adequate width and opening requirements and have non-restrictive hardware. Provision of complying construction is required.
		3.6.4 Signage
	X	Signage along the accessible route does not appear to comply with accessibility guidelines. Signage is required at all designated parking spaces, along the marked accessible route and building interior. Signage with raised Braille characters is required at all doors designating permanent rooms or spaces. Provision of complying construction is required.
		3.6.5 Public Toilet Rooms
X		Public toilets are provided along the accessible route and do not appear to comply with accessibility guidelines. Public toilets are required to provide accessible entry, maneuverability, clear floor space and accessible fixtures, accessories, controls, partitioned stalls and recessed insulated lavatory piping. Provision of complying construction is required.
	X	Administrative staff and nurse's toilets are provided and do not appear to meet accessibility guidelines. Provision of complying construction with guidelines similar to public toilets is required.

I	LT	Reference
	X	Classroom toilets are provided and do not appear to meet accessibility guidelines. Provision of complying construction with guidelines similar to public toilets is recommended.
	X	The shower in the staff area is not accessible. Remediation is recommended.
		3.6.6 Drinking Fountains
X		Drinking fountains are provided along the accessible route and do not appear to comply with accessibility guidelines. Drinking fountains are required to be accessible with adequate clearances and corridor protrusion protection if not recessed into the wall or alcove with more than 4 inches protruding into the accessible route. Provision of complying construction is required.
		3.6.7 Telephones
		Public telephones are not provided along the accessible route. No remediation recommended.
		3.6.8 Elevators/Lifts
		Accessible elevators are not required.
	X	A platform/wheelchair lift is not provided at the stage. A platform/wheelchair lift for the stage is required.
		3.6.9 Recreational Facilities
X		Play areas, equipment and surfacing appear to be available in individual play area groups. Accessible routes have not been provided. One play area with an accessible route, equipment and accessible surfacing material is required at each play area group.
		3.7 Life Safety and Fire Protection
		3.7.1 Sprinklers and Standpipes
X		A required sprinkler system is not provided for all janitor and custodial spaces. Corrective action is required.
X		A required sprinkler system is not provided for the stage. Corrective action is required.
X		The kitchen hood is exhaust only type. Distance from cooking surfaces and edge of kitchen hood do not appear to comply with distance requirements. Kitchen hood

I	LT	Reference
		duct protection is not fire resistive construction. The kitchen hood system is in poor condition. Corrective action is required.
X		A required fire suppression system is provided in the kitchen hood. Cooking equipment does have required shut down capability upon suppression system activation. Corrective action is required with hood replacement.
X		Provision of fire extinguishers within required travel distances do not appear to comply with life safety standards. Corrective action is required.
		3.7.2 Alarm Systems
X		The visual alarm system does not appear to comply with ADA guidelines or life safety standards. Visual alarms located 80 inches above the floor to the bottom of the lens are required in all corridors, common use spaces and rooms with more than one occupant. Corrective action is required. A fire alarm and annunciator panel is provided. A required smoke detector is provided in front of the panel. Corrective action is not required. Required pull stations are provided at emergency egress doors and are mounted at heights complying with ADA guidelines. Corrective action is not required.
		3.7.3 Corridor and Separation Walls
X		Exit corridor and area separation walls do not appear to have required firestopping sealing between wall and structural surfaces and framing or around wall penetrations. Borrowed lights do not appear to have fire resistive construction. Ductwork penetrations do not appear to have required fire/smoke dampers. Corrective action is required.
		3.7.4 Doors
		Corridor doors, frames, hardware and assemblies do not appear to comply with life safety fire resistance rating standards. Some doors have louvers that allow the transfer of air between interior spaces and corridors. Corridor doors are required to have fire resistance rated construction and hardware assemblies. Corrective action is required. Refer to Section 3.6 for Opinions of Probable Costs of remediation. Area separation doors, frames, hardware and assemblies appear to comply with fire resistance rated construction requirements. Corrective action is not required. Emergency exit doors, frames, hardware and assemblies appear to comply with emergency exiting requirements. Corrective action is not required.

I	LT	Reference
		3.7.5 Classroom Emergency Exiting
		Operable window units and exit doors to building exterior provide classroom emergency exiting and appear to comply with emergency exiting requirements. Corrective action is not required.
		3.7.6 Emergency Egress Lighting
X		Corridor emergency egress lighting is not provided. Corrective action is required.
X		Emergency egress lighting is not provided in required windowless rooms. Corrective action is required.
		Illuminated directional emergency exit signs are provided at every required location and are clearly visible. Corrective action is not required.
		3.8 Asbestos Concerns
		According to the AHERA Report, this facility does have asbestos-containing material (ACM). Remaining asbestos-containing material (ACM) is non-friable, not damaged, is inaccessible and is not currently hazardous to building occupants. ACM is located in floor tile and mastic, wall tile mastic, and piping and fitting insulation.
	X	Removal of all ACM is recommended long-term.

4.0 Opinions of Probable Costs to Remedy Physical Deficiencies (Pierce Elementary)

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 are 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, Intermediate, and Long-term Remediation items are as follows:

Immediate	$ 1,161,000
Intermediate	$ 0
Long-term	$ 1,048,000
Total Remediation Costs	$ 2,209,000

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 $7,047,000. This cost was determined based on the following square foot cost escalated from TM 5-800-4:

$145.83/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 the 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 Pierce is a combination of additions and the original 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 Pierce Elementary School.

ESL (yrs)	AGE (yrs)	RUL (yrs)	PRV ($)	TARGET SUSTAIN (Annual $)	REMED. COSTS ($)	REQ'D INVEST. (Annual $)	MRM	RECOMMEND
67	*34.5	*32.5	7,047,000	105,200	2,209,000	68,000	.65	Renovate

*Represents Composite Number.

Based on our analysis of the remediation costs, it is our opinion that this school should be renovated to bring it into compliance with applicable codes and repair problems with major building systems.

Refer Appendix for Total Cost Summary

Refer Appendix for Immediate Remediation Item Detail Table

Refer Appendix for Long-Term Remediation Item Detail Table

PIERCE ELEMENTARY SCHOOL

Photo 1: School Entrance

Photo 2: Cracked Masonry

Photo 3: Paving in Poor Condition

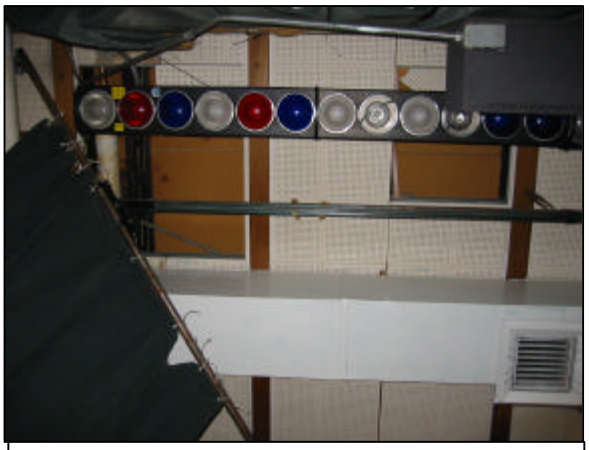


Photo 4: No Fire Sprinkler Above Stage

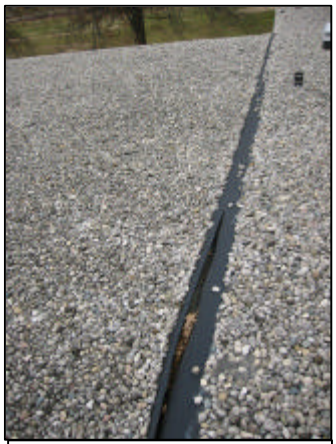


Photo 5: Damaged Built-up Roofing

Photo 6: Upgrade Electrical Panel

3.0 System Description and Observations: Scott Middle School

I	LT	Reference
		3.1 Overall General Description
		This facility is a 69,600 square foot, one story building constructed in 1957 and rebuilt due to fire in 1992. Subsequent additions were: ? Chiller building in 1994 ? Freestanding gymnasium in 1997 Duncan Center is attached to this facility. This facility serves 380 students in grades seven through nine. Total student capacity is 580.
		3.2 Site
		3.2.1 Topography and Storm Water Drainage
		Slopes away from building appear to provide adequate drainage and the site does not appear to exhibit water-retaining problems. No remediation recommended. Site storm water drainage is by area drains, underground collection system, and surface runoff and does appear to be adequate for water control. No remediation recommended. Roof drainage is by a gutter and downspout system that discharges into an underground storm sewer collection system and onto concrete splash blocks. The underground system is not visible and is assumed to be in good condition. No remediation recommended.
		3.2.2 Paving, Curbing and Parking
	X	Parking area paving is asphaltic concrete. Paving, curbing and parking is in fair condition. Repair and replacement of damaged parking paving and pavement marking is recommended. Parking areas do not appear to provide adequate parking spaces. Development of additional parking area is recommended.
		3.2.3 Flatwork
	X	Concrete walkways and ramps are in poor condition. Walkways exhibit cracking, spawling, settlement, and missing and deteriorated joint sealant. Repair and replacement of damaged walkways is recommended.

I	LT	Reference
	X	Major walkways between main building areas and freestanding gymnasium building are protected by metal covered structures in fair condition. Repair and replacement of damaged areas and refinishing painted surfaces is recommended.
		3.2.4 Recreational Facilities and Title IX Compliance
	X	Play fields for boy's and girl's field sports are available on-site and are in fair condition. Field facilities include bleachers, concession buildings and toilets. Repair and replacement of damaged field areas and field facilities is recommended. Play field lighting is available and is required. All lighting is in fair condition. No remediation recommended.
	X	A hard surface play area without sports play equipment is provided and is in fair condition. Repair and replacement of damaged surface areas is recommended. A gymnasium provides indoor court sport recreational and assembly space. The school does not sponsor specific team sport programs and does appear to be in compliance with Title IX regulations. No remediation recommended.
		3.2.5 Utilities
		3.2.5.1 Water
		Domestic water main service does appear to be adequate and is in fair condition. No remediation recommended. A water meter is available. No remediation recommended.
X		A backflow preventer to protect against cross contamination is provided at the gymnasium, but not at the main boiler room. The gymnasium backflow preventer is in good condition. Provision of a backflow preventer at the main boiler room is required.
		3.2.5.2 Natural Gas
		Gas service is multiple service. The natural gas service does appear to be adequate and is in good condition. No remediation recommended.

I	LT	Reference
		3.2.5.3 Sanitary Sewer
		Sanitary sewer service does appear to be adequate and is in fair condition. No remediation recommended.
		3.2.5.4 Special Utility Systems
		Not applicable.
		3.2.5.5 Electrical Service and Metering
X		Electrical service is multiple service and is underground pad mount. The service does appear to be adequate and is in fair condition. No remediation recommended. The *National Electrical Code* (NEC) (Article 230-2) limits a single building to a single electrical service. There are exceptions allowed to provide more than one service, but the NEC required specific documented approval of the authority having jurisdiction. Multiple electrical service represent a safety hazard to maintenance personnel and a plaque or sign is required to be provided at each electrical service clearly indicating the locations where the other services to the building are located.
		3.3 Structural Frame and Building Envelope
		3.3.1 Foundation
		The foundation is assumed to be reinforced concrete grade beams, supported by continuous spread and spot footings with concrete floor slab-on-grade in good condition. No remediation recommended.
		3.3.2 Building Frame
		Building frame for the main building is reinforced concrete masonry unit shear walls with steel joists. Roof decking is bulb tees and gypsum. The structural system is in good condition. No remediation recommended. Second floor framing for mechanical mezzanines is steel joists. Decking is structural metal. The structural system is in good condition. No remediation recommended. Building frame for the freestanding gymnasium is structural steel columns and beams with steel joists and trusses. Roof decking is structural metal. The structural system is in good condition. No remediation recommended.

I	LT	Reference
		3.3.3 Facades or Curtainwall
		3.3.3.1 Sidewall System
		Building exterior on the gymnasium is face brick masonry veneer in good condition. No remediation recommended.
	X	Building exterior is exterior insulation and finish system (EIFS) in fair condition. EIFS exhibits surface deterioration, stress cracking, isolated surface damage, discoloration, soiling, staining and algae growth. Repair and replacement of damaged areas, general cleaning and surface refinishing is recommended.
		3.3.3.2 Entrances/Exits
		Main entrance/exit is pre-finished anodized aluminum doors and framing with glazing in good condition. No remediation recommended. Auxiliary exit/entrances are painted hollow metal doors and frames with glazing in fair condition. No remediation recommended.
		3.3.3.3 Fenestration System
	X	Fenestration system is pre-finished anodized aluminum framing with untinted double glazing in good condition. Repair of operable windows is recommended.
		3.3.3.4 Soffits
		Soffits at main entrance/exit, auxiliary exit/entrances and roof overhangs are pre-finished aluminum in fair condition. No remediation recommended.
		3.3.3.5 Parapets
		There are no parapets.
		3.3.4 Roofing
	X	Sloped pre-finished standing seam metal roofing is located on the gymnasium and is in good condition. Leaks are not evident. Repair and replacement of damaged areas and addition of snow guards is recommended.
	X	The existing roofing system has been covered with a sloped pre-finished standing seam metal roofing system and is in fair condition. Leaks are evident. Repair and replacement of damaged areas and addition of snow guards is recommended.

I	LT	Reference
	X	Flashing, coping, fascia, gutters and downspouts are pre-finished metal in fair condition. Repair and replacement of damaged areas is recommended.
		3.4 Interior Elements
		3.4.1 Common Areas
		Lobbies and corridors: ? Flooring is vinyl tile in good condition. ? Walls painted concrete masonry units in good condition. ? Solid ceilings and furring are painted gypsum board in good condition. Some ceiling areas are cracked and one is sagging. Public toilets: ? Flooring is ceramic tile and vinyl tile in good condition. ? Walls are painted concrete masonry units in fair condition. ? Solid ceilings are painted gypsum board in fair condition. Administrative, media center and classroom areas: ? Flooring is vinyl tile and carpet in fair condition. ? Walls are painted concrete masonry units in fair condition. ? Solid ceilings and furring are painted gypsum board in fair condition. ? Suspended acoustical lay-in panel ceilings are in good condition. Cafeteria: ? Flooring is vinyl tile in fair condition. ? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units in fair condition. ? Suspended acoustical lay-in panel ceilings are in fair condition. Gymnasium: ? Flooring is poured rubber surface in good condition. ? Walls are painted concrete masonry units in fair condition. ? Solid ceilings are exposed painted structure and decking in good condition.

I	LT	Reference
		Gymnasium toilets and locker rooms: ? Flooring is poured resinous material in fair condition. ? Walls are painted concrete masonry units in fair condition. ? Solid ceilings are painted gypsum board in fair condition. Stage: ? Flooring is vinyl tile in good condition. ? Walls are painted concrete masonry units in fair condition. ? Suspended acoustical lay-in panel ceilings are in good condition.. Kitchen: ? Flooring is ceramic tile in good condition. ? Walls are painted concrete masonry units in fair condition. ? Suspended acoustical lay-in panel ceilings are in fair condition.
		3.5 Mechanical and Electrical System
		3.5.1 Overall General Description
		The HVAC system for the majority of the school includes air handling units served by chilled water and heating hot water. The chilled water serving these units originates from the packaged air cooled chiller, located immediately outside the main boiler room. The cooling system appears to be in good condition. Heating is accomplished by gas fired heating hot water boilers. The detached gymnasium is served by a separate hot water heating boiler and packaged air cooled chiller serving a central air handling unit. The various systems are in good condition and remediation is not required. There are two Bryan Model CL120 hot water boilers in the main boiler room that provide heating for most of the school. The gymnasium has a Peerless Model cast iron hot water boiler. All of the boilers are gas fired. For the main building and gymnasium, heating hot water is distributed to the coils of air handling units by means of circulating pumps. As mentioned earlier, chillers provide cooling for the school. The main school building is served by a large Trane packaged air cooled chiller. The gymnasium is served by a small packaged air cooled Trane chiller. The existing chillers appear to be in good condition. Chilled water pumps distribute chilled water to the various chilled water coils on air handling units. Ductwork distributes cool air to the various classrooms utilizing variable air volume (VAV) boxes.

I	LT	Reference
		Temperatures and various control elements are monitored by the base-wide Johnson Controls "Metasys" system. The existing primary temperature control system is pneumatic and obsolete. A project is underway to convert the controls to DDC.
		3.5.2 Plumbing System
		3.5.2.1 Plumbing Supply and Waste Piping
		Water supply and waste piping appear to be in good condition. No remediation recommended.
X		The kitchen is not served by a grease trap. Provision of a two-compartment grease trap is required.
		3.5.2.2 Domestic Hot Water Production
		Domestic hot water is provided by gas-fired water heaters. This system is generally in fair condition. No remediation recommended.
		3.5.2.3 Fixtures
		Plumbing fixtures and connections appear to be in fair condition. No remediation recommended.
		3.5.2.4 Fuel Piping
		Natural gas piping is adequate and is in good condition. No remediation recommended.
		3.5.3 Electrical System
		3.5.3.1 Main Service
		The main electrical distribution panel for the main building is a 2,500-amp, 120/208-volt, 3-phase, 4-wire panel. The panel does appear to be adequate and is in fair condition. Corrective action is not required. The main electrical distribution panel for the gymnasium is a 500-amp, 120/208-volt, 3-phase, 4-wire panel. The panel does appear to be adequate and is in good condition. Corrective action is not required.

I	LT	Reference
		3.5.3.2 Distribution and Panels
	X	Electrical distribution and branch panels appear to be adequately sized and are in good condition. Additional panels are recommended due to increased need of convenience outlets for the classrooms.
		3.5.3.3 Interior Lighting
		Typical classroom lighting is recessed troffer type fluorescent fixtures. Lamps are T-8 with electronic ballasts. Light levels appeared to be adequate. Lighting is generally in good condition and remediation is not required. Hallway and corridor lighting consists of recessed fluorescent troffers that appear to provide adequate light levels. These lights are generally in good condition and remediation is not required.
		3.5.3.4 Exterior Lighting
	X	Exterior lighting consists of metal halide type wall pack fixtures. Light levels on the exterior appear to be adequate, except at the courtyard area outside of the main boiler room. Remediation is recommended at that location. Soffit and entrance lighting consists of high pressure sodium down lights in good condition. Remediation is not required. Covered canopy light consists of metal halide and fluorescent fixtures. Lighting appears to be adequate and remediation is not required. Parking lot light consists of pole mounted metal halide fixtures in fair condition. Light levels appear to be adequate. Remediation is not required.
		3.5.3.5 Security System
		A security system is provided and is monitored by a central agency. The security system does appear to provide adequate security and is in good condition. Corrective action is not required.
		3.5.3.6 Intercom System
		Intercom system does allow communication to individual classrooms and outside telephone calls. The system is in good condition. Corrective action is not required.

I	LT	Reference
		3.5.3.7 Educational Television
		Educational television is provided and does not allow internal broadcasting. The system is in good condition. Corrective action is not required.
		3.5.3.8 Computer Network
		A computer network system provides adequate LAN outlets for each classroom. The computer network system does appear to be adequate and is in good condition. Corrective action is not required.
		3.6 ADA Tier I: Visual Accessibility Survey
		3.6.1 Path of Travel
X		A marked accessible route from parking is not provided. One accessible route shall be provided from the boundary of the site from public transportation stops, accessible parking spaces, passenger loading zones, public streets or walkways to an accessible building entrance. The accessible route within the facility must comply with minimum widths, clearances, reach requirements, detectable warnings, protrusion protection, changes in elevation, maximum slopes and cross slopes. Provision of complying construction is required.
X		Curb ramps on approaches to the facility from student drop off areas and parking do not appear to provide accessible slopes and/or required textures. Provision of complying construction is required. Walkway approaches to the main entrance doors appear to provide accessible slopes without threshold entry restrictions. No remediation recommended. Ramps along the interior accessible route are required and are provided. Ramps appear to comply with accessibility guidelines. Required handrails are provided. Handrails appear to comply with height and extension requirements. No remediation recommended.
X		Some interior exits have steps without ramps and appear to meet accessibility guidelines. Signage designating the exit as "NOT HANDICAPPED ACCESSIBLE" is required.

I	LT	Reference
		3.6.2 Parking
X		Parking does not appear to comply with accessibility guidelines. Parking areas require marked spaces based on 1 accessible space for each 25 spaces, a minimum of one van accessible space for each 8 accessible spaces with slopes not exceeding 1:50 (2%) in all directions, access aisles, signage and marked accessible route. Provision of complying construction is required.
		3.6.3 Entrances/Exits
		Main entrance/exit approach, doors and hardware along the accessible route appear to comply with accessibility guidelines. No remediation recommended.
	X	Some auxiliary exit/entrance doors exit to porches that do not appear to provide exiting to accessible walkways or ramps. Provision of accessible exits by construction of new porches, ramps, required handrails or site regrading is required.
X		Interior doors along the accessible route are flush with corridor wall and appear to allow clearance and approach accessibility for most accessible spaces. At least one door for each accessible space must comply with accessibility guidelines. Provision of complying construction is required.
X		Door assemblies do not appear to meet accessibility guidelines. All doors are required to have adequate maneuvering clearances from either side with adequate width and opening requirements and have non-restrictive hardware. Provision of complying construction is required.
		3.6.4 Signage
	X	Signage along the accessible route does not appear to comply with accessibility guidelines. Signage is required at all designated parking spaces, along the marked accessible route and building interior. Signage with raised Braille characters is required at all doors designating permanent rooms or spaces. Provision of complying construction is required.
		3.6.5 Public Toilet Rooms
X		Public toilets are provided along the accessible route and do not appear to comply with accessibility guidelines. Public toilets are required to provide accessible entry, maneuverability, clear floor space and accessible fixtures, accessories, controls, partitioned stalls and recessed insulated lavatory piping. Provision of complying construction is required.

I	LT	Reference
	X	Administrative staff and nurse's toilets are provided and do not appear to meet accessibility guidelines. Provision of complying construction with guidelines similar to public toilets is required.
		3.6.6 Drinking Fountains
X		Drinking fountains are provided along the accessible route and do not appear to comply with accessibility guidelines. Drinking fountains are required to be accessible with adequate clearances and corridor protrusion protection if not recessed into the wall or alcove with more than 4 inches protruding into the accessible route. Provision of complying construction is required.
		3.6.7 Telephones
		Public telephones are not provided along the accessible route. No remediation recommended.
		3.6.8 Elevators/Lifts
		Accessible elevators are not required.
	X	A platform/wheelchair lift is not provided at the stage. A platform/wheelchair lift for the stage is required.
		3.6.9 Recreational Facilities
		Play field areas appear to be accessible. No remediation required.
		3.7 Life Safety and Fire Protection
		3.7.1 Sprinklers and Standpipes
		A required sprinkler system is provided for janitor and custodial spaces. Corrective action is not required.
		The stage is being used as a Teachers' Lounge.
X		A required sprinkler system is not provided for the stage. Corrective action is required.
		The kitchen hood is compensating type. Distance from cooking surfaces and edge of kitchen hood appear to comply with distance requirements. Kitchen hood duct protection is fire resistive construction. The kitchen hood system is in good condition. Corrective action is not required.

I	LT	Reference
		A required fire suppression system is provided in the kitchen hood. Cooking equipment does have required shut down capability upon suppression system activation. Corrective action is not required.
X		Provision of fire extinguishers within required travel distances do not appear to comply with life safety standards. Corrective action is required.
		3.7.2 Alarm Systems
X		The visual alarm system does not appear to comply with ADA guidelines or life safety standards. Visual alarms located 80 inches above the floor to the bottom of the lens are required in all corridors, common use spaces and rooms with more than one occupant. Corrective action is required.
		A fire alarm and annunciator panel is provided. A required smoke detector is provided in front of the panel. Corrective action is not required.
		3.7.3 Corridor and Separation Walls
X		Exit corridor and area separation walls do not appear to have required firestopping sealing between wall and structural surfaces and framing or around wall penetrations. Borrowed lights appear to have fire resistive construction. Ductwork penetrations do not appear to have required fire/smoke dampers. Corrective action is required.
		3.7.4 Doors
		Corridor doors, frames, hardware and assemblies appear to comply with life safety fire resistance rating standards. Corrective action is not required.
		Area separation doors, frames, hardware and assemblies appear to comply with fire resistance rated construction requirements. Corrective action is not required.
		Emergency exit doors, frames, hardware and assemblies appear to comply with emergency exiting requirements. Corrective action is not required.
		3.7.5 Classroom Emergency Exiting
		Operable window units to building exterior provide classroom emergency exiting and appear to comply with emergency exiting requirements. Corrective action is not required.

I	LT	Reference
		3.7.6 Emergency Egress Lighting
		Corridor emergency egress lighting is provided. Fixtures are wall mounted package units with required testing devices. Corrective action is not required. Illuminated directional emergency exit signs are provided at every required location and are clearly visible. Corrective action is not required.
		3.8 Asbestos Concerns
		According to the AHERA Report, this facility does not have asbestos-containing material (ACM) and no remediation is required.

4.0 Opinions of Probable Costs to Remedy Physical Deficiencies (Scott Middle School)

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 are 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, Intermediate, and Long-term Remediation items are as follows:

Immediate	$ 321,000
Intermediate	$ 0
Long-term	$ 490,000
Total Remediation Costs	$ 811,000

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 $10,381,000. This cost was determined based on the following square foot cost escalated from TM 5-800-4:

$145.83/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 the 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 Scott is a combination of additions and the original 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 Scott Middle School.

ESL (yrs)	AGE (yrs)	RUL (yrs)	PRV ($)	TARGET SUSTAIN (Annual $)	REMED. COSTS ($)	REQ'D INVEST. (Annual $)	MRM	RECOMMEND
67	*36	*31	10,381,000	154,900	811,000	26,200	.17	Renovate

*Represents Composite Number.

Based on our analysis of the remediation costs, it is our opinion that this school should be renovated to bring it into compliance with applicable codes and repair problems with major building systems.

Refer to Appendix for Total Cost Summary

Refer Appendix for Immediate Remediation Item Detail Table

Refer Appendix for Long-Term Remediation Item Detail Table

SCOTT MIDDLE SCHOOL

Photo 1: Entrance

Photo 2: Provide Additional Distribution Panels

Photo 3: Sidewalks in Poor Condition

Photo 4: Damaged Exterior Wall

Photo 5: Damaged Wall Material

Photo 6: Non-ADA Door Hardware

3.0 System Description and Observations: Van Voorhis Elementary School

I	LT	Reference
		3.1 Overall General Description
		This facility is an 83,600 square foot, one story building constructed in 1958. Subsequent additions were: ? Media center in 1987 ? Classroom addition in 1995 ? Gymnasium in 1996 ? Two chiller buildings in 1986 ? A freezer building in 1992 A PTR classroom addition is scheduled for completion in 2003. This facility serves 550 students in grades pre-kindergarten through three. Total student capacity is 672.
		3.2 Site
		3.2.1 Topography and Storm Water Drainage
		Slopes away from building appear to provide adequate drainage and the site does not appear to exhibit water-retaining problems. No remediation recommended. Site storm water drainage is by area drains, underground collection system, and surface runoff and does appear to be adequate for water control. No remediation recommended. Roof drainage is by a gutter and downspout system that discharges into an underground storm sewer collection system. The underground system is not visible and is assumed to be in good condition. No remediation recommended.
		3.2.2 Paving, Curbing and Parking
	X	Parking area paving is asphaltic concrete. Paving, curbing and parking is in poor condition. Repair and replacement of damaged parking paving, curbs, gutters, bumpers and pavement marking is recommended. Parking areas appear to provide adequate parking spaces. No remediation recommended.

I	LT	Reference
		3.2.3 Flatwork
	X	Concrete walkways and ramps are in fair condition. Walkways exhibit cracking, spawling, and missing and deteriorated joint sealant. Repair and replacement of damaged walkways is recommended.
	X	Major walkways connecting buildings between main building and freestanding gymnasium building are protected by metal covered structures in fair condition. Repair and replacement of damaged areas and refinishing painted surfaces is recommended.
		3.2.4 Recreational Facilities and Title IX Compliance
		A hard surface play area with sports play equipment is provided and is in poor condition. Repair and replacement of damaged surface areas and equipment is recommended. Cost is noted in 3.6.9.
	X	Play areas are provided with various types of equipment in fair condition. Repair and replacement of damaged play equipment is recommended.
	X	Play surfaces include gravel, sand and shredded bark chips in fair condition. Play surfaces appear to comply with the U.S. Consumer Safety Commission "Handbook for Public Playground Safety" requirements. Repair and replacement of damaged play surfaces is recommended. A cafeteria and gymnasium provide indoor court sport recreational and assembly space. The school does not sponsor specific team sport programs and does appear to be in compliance with Title IX regulations. No remediation recommended.
		3.2.5 Utilities
		3.2.5.1 Water
		Domestic water main service does appear to be adequate and is in fair condition. A 2" water pipe enters the main boiler room across from the cafetorium. No remediation required. A water meter is located in an underground vault. The meter appears to be in fair condition. No remediation is recommended.
X		Backflow preventers to protect against cross contamination are provided at all areas except the main boiler room. Backflow preventers are in good condition. Provision of a backflow preventer at the main boiler room is required.

I	LT	Reference
		3.2.5.2 Natural Gas
		Gas service is multiple service. These locations are at the mechanical room of the second grade wing and at the detached gymnasium. The services appear to be adequate and are in good condition. No remediation recommended.
		3.2.5.3 Sanitary Sewer
X		Sewer service from the school flows to the southwest. The service does appear to be adequate. The underground system is not visible and is assumed to be in fair condition, based on the age of the school. However, there have been reports of problems with the sewer system in the vicinity of the Media Center Addition. It appears that this addition was built over some existing sewer piping. Repair and replacement of underground piping is required to re-route the sewer piping around the Media Center immediately. For the remainder of the system, repair and replacement is not recommended at this time, but it is recommended that the main sewer lateral be reviewed utilizing cameras in order to more accurately determine condition. No remediation recommended at this time, except for the area around the Media Center.
X		A grease trap is not provided. A two-compartment grease trap is required.
		3.2.5.4 Special Utility Systems
		Not applicable.
		3.2.5.5 Electrical Service and Metering
		Electrical service is multiple service and is both overhead and underground pad mount. The service does appear to be adequate and is in good condition. No remediation recommended.
X		The *National Electrical Code* (NEC) (Article 230-2) limits a single building to a single electrical service. There are exceptions allowed to provide more than one service, but the NEC required specific documented approval of the authority having jurisdiction. Multiple electrical service represent a safety hazard to maintenance personnel and a plaque or sign is required to be provided at each electrical service clearly indicating the locations where the other services to the building are located.

I	LT	Reference
		3.3 Structural Frame and Building Envelope
		3.3.1 Foundation
		The foundation is assumed to be reinforced concrete grade beams, supported by continuous spread and spot footings with concrete floor slab-on-grade in fair condition. No remediation recommended.
		3.3.2 Building Frame
		Building frame is reinforced concrete masonry unit shear walls for the original building and structural steel columns and beams for the classroom addition, with steel joists. Roof decking is bulb tees and gypsum for the original building and plywood sheathing for the classroom addition. The structural system is in good condition. No remediation recommended. Building frame for the freestanding gymnasium is structural steel columns and beams with steel joists and trusses. Roof decking is metal. The structural system is in good condition. No remediation recommended.
		3.3.3 Facades or Curtainwall
		3.3.3.1 Sidewall System
X		Building exterior is face brick masonry veneer in fair condition. Masonry exhibits surface deterioration, stress cracking, missing and damaged masonry units and grout, deteriorated joint sealant, efflorescence, soiling, staining and algae growth in various locations. Repair and replacement of damaged masonry, grout, joint sealant and surface cleaning is required.
	X	Building exterior on upper walls of the cafeteria/gymnasium is exterior insulation and finish system (EIFS) in fair condition. EIFS exhibits surface deterioration, isolated surface damage and soiling. Repair and replacement of damaged areas and general cleaning is required.
		3.3.3.2 Entrances/Exits
		Main entrance/exit is pre-finished anodized aluminum doors and framing with glazing in good condition. No remediation recommended. Auxiliary exit/entrances are pre-finished anodized aluminum doors and framing with glazing and painted hollow metal doors and frames with glazing in fair condition. No remediation recommended.

I	LT	Reference
		3.3.3.3 Fenestration System
		Fenestration system is pre-finished anodized aluminum framing with untinted double glazing and pre-finished metal spandrel panels in fair condition. No remediation recommended.
		3.3.3.4 Soffits
		Soffits at main entrance/exit, auxiliary exit/entrances and roof overhangs are pre-finished aluminum in fair condition. No remediation recommended.
		3.3.3.5 Parapets
	X	Areas with parapets are extensions of the indicated wall systems and are protected with metal coping in fair condition. Repair and replacement of damaged parapets and metal coping is required with roof replacement.
		3.3.4 Roofing
	X	Low slope fully adhered EPDM is located on the annex and media center addition and is in fair condition. Leaks are not evident. Repair and replacement of damaged areas is required.
	X	Low slope ballasted EPDM roofing is located on the original building and is in fair-to-poor condition. Leaks are evident. Repair and replacement of damaged areas is required. Sloped pre-finished standing seam metal roofing is located on the gymnasium and is in good condition. Leaks are not evident. No remediation recommended.
	X	Sloped composition shingle roofing is located on the media center and is in generally fair condition. Leaks are evident. Corrective action is required.
	X	Flashing, coping, fascia, gutters and downspouts are pre-finished metal in fair condition. Repair and replacement of damaged areas is required.

I	LT	Reference
		3.4 Interior Elements
		3.4.1 Common Areas
		Lobbies and corridors: ? Flooring is vinyl tile in good condition in the media center and classroom addition and is in fair condition in the original building. ? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units in all areas except the classroom addition that is painted concrete masonry units in fair condition. ? Solid ceilings and furring are painted gypsum board in fair condition. ? Suspended acoustical lay-in panel ceilings are in poor condition. Public and classroom toilets: ? Flooring is ceramic tile in good condition. ? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units and painted concrete masonry units in fair condition. ? Solid ceilings and furring are painted gypsum board and painted plaster in fair condition. ? Suspended acoustical lay-in panel ceilings are in good condition. Administrative, media center and classroom areas: ? Flooring is vinyl tile and carpet in fair condition. ? Walls are painted concrete masonry units and painted gypsum board in fair condition. ? Solid ceilings and furring are painted gypsum board in fair condition. ? Suspended acoustical lay-in panel ceilings are in fair condition. Cafeteria: ? Flooring is vinyl tile in poor condition. ? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units in fair condition. ? Suspended acoustical lay-in panel ceilings are in poor condition. Gymnasium: ? Flooring is poured rubber surface in good condition. ? Walls are concrete masonry units and painted concrete masonry units in fair condition. ? Solid ceilings are exposed painted structure and decking in good condition.

I	LT	Reference
		Gymnasium toilets and locker rooms: ? Flooring is poured resinous material in poor condition. ? Walls are painted concrete masonry units in fair condition. ? Solid ceilings are painted gypsum board in fair condition. Stage: ? Flooring is finished wood in fair condition. ? Walls are painted concrete masonry units in poor condition. ? Suspended acoustical lay-in panel ceilings are in fair condition. Kitchen: ? Flooring is ceramic tile in good condition. ? Walls are glazed concrete masonry unit wainscot and painted concrete masonry units in fair condition. ? Solid ceilings and furring are painted plaster in fair condition.
	X	General: ? Replacement of finishes affected by asbestos abatement is required.
		3.5 Mechanical and Electrical System
		3.5.1 Overall General Description
X		The HVAC system for the majority of the school includes rooftop cooling only air handling units served by chilled water. The chilled water serving these rooftop units originates from two chiller buildings, each with interior water chiller and rooftop condenser. Chilled water pumps distribute chilled water to the various chilled water coils on air handling units. Ductwork distributes cool air to the various classrooms. These cooling systems appear to be in good condition. Heating is accomplished by means of perimeter unit ventilators and fan and coil units utilizing gas fired heating hot water boilers generated from the main boiler room and distributed by multiple zone pumps. The second grade addition is served by unit ventilators in each classroom with chilled water from a small packaged air cooled chiller and heating hot water from a small boiler. The condenser fins on the packaged chiller are severely dinged, either by vandalism or by hail. These fins should be repaired and provided with a guard to prevent further damage. The gas fired hot water heating boiler appears to have severe corrosion and should be repaired. Corrective action is required.

I	LT	Reference
		A recently constructed four-classroom addition is served by two air source heat pump units for cooling and heating, with electric supplementary resistance heat. The detached gymnasium is served by a hot water heating boiler serving a central suspended air handling unit. The air handling unit can provide a large amount of fresh air to the building, but it does not have the capability to provide cooling. This system is in fair condition and remediation is not required at this time. Hot water is supplied by domestic hot water heaters.
X		There are two Spencer hot water boilers in the main boiler room that provide heating for a majority of the building. The mechanical rooms in the second grade addition and in the gymnasium each have a small Peerless cast iron hot water boiler. All of the boilers are gas fired. The Spencer boilers are old and should be replaced, as well as the pumps and associated piping.
X		Chillers provide cooling for a majority of the school. Two chiller buildings contain interior chillers with remote roof mounted condensers. The second grade addition has a small packaged air cooled chiller. The roof mounted condensers, located on the roof of the chiller buildings, are showings signs of age and are exhibiting rust. The packaged air cooled chiller serving the second grade addition lacks a hail guard and exhibits damage to vertical exposed condenser coils. Corrective action is required.
X		Temperatures and various control elements are monitored by the base-wide Johnson Controls "Metasys" system. The existing primary temperature control system is pneumatic and obsolete. A project is underway to convert the controls to DDC, but is not yet funded. Corrective action is required to replace HVAC controls.
		3.5.2 Plumbing System
		3.5.2.1 Plumbing Supply and Waste Piping
		Water supply and waste piping appear to be in fair condition. Visible lines were not corroded. No remediation required.
		3.5.2.2 Domestic Hot Water Production
X		Domestic hot water is provided by four 86-gallon, gas fired water heaters in the Main Boiler Room. One of the water heaters is badly corroded and requires replacement. Another water heater has some corrosion problems, but can probably be repaired. The Second Grade Addition has a single 30-gallon, gas fired water heater and the Gymnasium has a 40-gallon, gas fired, storage tank type, hot water heater

I	LT	Reference
		The overall hot water heating system is generally in fair and with only the replacement of the single corroded unit at the Main Boiler Room required immediately.
		3.5.2.3 Fixtures
	X	The existing plumbing system is variable in age, with the oldest components being approximately 40+ years old. Fixture connections appear to be in fair condition. Plumbing fixtures in the original school building are in poor condition. The remaining fixtures in the newer additions are in fair to good condition. Corrective action is required.
		3.5.2.4 Fuel Piping
		Natural gas piping is adequate and is in good condition. No remediation recommended.
		3.5.3 Electrical System
		3.5.3.1 Main Service
	X	The main electrical distribution panel for the Main Boiler Room is a 1,000-amp, 120/208-volt, 3-phase, 4-wire panel. The panel does not appear to be adequate and is in poor condition. Corrective action is required. The main electrical distribution panel for the second grade addition is a 400-amp, 120/208-volt, 3-phase, 4-wire panel. The panel does appear to be adequate and is in fair condition. Corrective action is not required. The main electrical distribution panel for Chiller Building One is a 350-amp, 277/480-volt, 3-phase, 4-wire panel. The panel does appear to be adequate and is in good condition. Corrective action is not required. The main electrical distribution panel for Chiller Building Two is a 350-amp, 277/480-volt, 3-phase, 4-wire panel. The panel does appear to be adequate and is in good condition. Corrective action is not required. The main electrical distribution panel for the gymnasium is a 325-amp, 120/208-volt, 3-phase, 4-wire panel. The panel does appear to be adequate and is in good condition. Corrective action is not required.

I	LT	Reference
		3.5.3.2 Distribution and Panels
		Electrical distribution and branch panels in the original school are old and in poor condition. Replacement or supplementation of these panels is required. Costs are included with those of Section 3.5.3.1.
		3.5.3.3 Interior Lighting
	X	Typical classroom lighting is surface mounted fluorescent fixtures in the original building and is recessed troffer fluorescent fixtures in the newer areas. Lamps are T-8 with energy saving ballasts. Light levels appeared to be inadequate. Lighting is generally good, but additional fixtures are required. Hallway and corridor lighting consists of recessed fluorescent troffers that appear to provide adequate light levels. These lights are generally in good condition and remediation is not required.
		3.5.3.4 Exterior Lighting
	X	Exterior lighting consists of metal halide type wall pack fixtures. These fixtures are sporadic in coverage. Light levels on the exterior do not appear to be adequate. Remediation is required.
	X	Soffit and entrance lighting consists of recessed incandescent fixtures in poor condition. Replacement of these fixtures is recommended. Covered canopy light is and appears to be adequate. Remediation is not required.
	X	Parking lot light consists of wall pack lighting on the building and street pole lighting. Light levels appear to be inadequate. Remediation is required.
		3.5.3.5 Security System
		A security system is provided and is monitored by a central agency. The security system does appear to provide adequate security and is in good condition. Corrective action is not required.
		3.5.3.6 Intercom System
		Intercom system is in place and consists of wall mounted phone units in each classroom, in addition to speakers. The main public address and intercom panel is located in the administrative area. The overall intercom system is in fair condition.

I	LT	Reference
		3.5.3.7 Educational Television
		Educational television is provided and does not allow internal broadcasting. The system is in good condition. Corrective action is not required.
		3.5.3.8 Computer Network
		A computer network system provides adequate LAN outlets for each classroom. The computer network system does appear to be adequate and is in good condition. Corrective action is not required.
		3.6 ADA Tier I: Visual Accessibility Survey
		3.6.1 Path of Travel
X		A marked accessible route from parking is provided and does not appear to comply with accessibility guidelines. One accessible route shall be provided from the boundary of the site from public transportation stops, accessible parking spaces, passenger loading zones, public streets or walkways to an accessible building entrance. The accessible route within the facility must comply with minimum widths, clearances, reach requirements, detectable warnings, protrusion protection, changes in elevation, maximum slopes and cross slopes. Provision of complying construction is required.
X		Curb ramps on approaches to the facility from student drop off areas and parking do not appear to provide accessible slopes and/or required textures. Provision of complying construction is required. Walkway approaches to the main entrance doors appear to provide accessible slopes without threshold entry restrictions. No remediation recommended.
X		Ramps along the interior accessible route are required and are provided. Ramps do not appear to comply with accessibility guidelines. Required handrails are not provided. Provision of complying construction is required.
X		Some interior exits have steps without ramps and do not appear to meet accessibility guidelines. Signage designating the exit as “NOT HANDICAPPED ACCESSIBLE” is required.

I	LT	Reference
		3.6.2 Parking
X		Parking does not appear to comply with accessibility guidelines. Parking areas require marked spaces based on 1 accessible space for each 25 spaces, a minimum of one van accessible space for each 8 accessible spaces with slopes not exceeding 1:50 (2%) in all directions, access aisles, signage and marked accessible route. Provision of complying construction is required.
		3.6.3 Entrances/Exits
		Main entrance/exit approach, doors and hardware appear to comply with accessibility guidelines. No remediation recommended.
X		Some auxiliary and emergency exit/entrance doors exit to porches that do not appear to provide exiting to accessible walkways or ramps. Provision of accessible exits by construction of new porches, ramps, required handrails or site regrading is required.
		Interior doors along the accessible route are flush with corridor walls and appear to allow clearance and approach accessibility for each accessible space. No remediation recommended.
X		Door assemblies do not appear to meet accessibility guidelines. All doors are required to have adequate maneuvering clearances from either side with adequate width and opening requirements and have non-restrictive hardware. Provision of complying construction is required.
		3.6.4 Signage
	X	Signage along the accessible route does not appear to comply with accessibility guidelines. Signage is required at all designated parking spaces, along the marked accessible route and building interior. Signage with raised Braille characters is required at all doors designating permanent rooms or spaces. Provision of complying construction is required.
		3.6.5 Public Toilet Rooms
X		Public toilets are provided along the accessible route and do not appear to comply with accessibility guidelines. Public toilets are required to provide accessible entry, maneuverability, clear floor space and accessible fixtures, accessories, controls, partitioned stalls and recessed insulated lavatory piping. Provision of complying construction is required.

I	LT	Reference
	X	Administrative staff and nurse's toilets are not provided and do not appear to meet accessibility guidelines. Provision of complying construction with guidelines similar to public toilets is required.
	X	Classroom toilets are provided and do not appear to meet accessibility guidelines. Provision of complying construction with guidelines similar to public toilets is recommended.
		3.6.6 Drinking Fountains
X		Drinking fountains are provided along the accessible route and do not appear to comply with accessibility guidelines. Drinking fountains are required to be accessible with adequate clearances and corridor protrusion protection if not recessed into the wall or alcove with more than 4 inches protruding into the accessible route. Provision of complying construction is required.
		3.6.7 Telephones
		Public telephones are not provided along the accessible route. No remediation recommended.
		3.6.8 Elevators/Lifts
		Accessible elevators are not required.
	X	A platform/wheelchair lift is not provided at the stage. A platform/wheelchair lift for the stage is required.
		3.6.9 Recreational Facilities
X		Play areas, equipment and surfacing do not appear to be available in individual play area groups. Accessible routes have not been provided. One play area with an accessible route, equipment and accessible surfacing material is required at each play area group.
		3.7 Life Safety and Fire Protection
		3.7.1 Sprinklers, Standpipes and Fire Suppression Systems
		A sprinkler system is provided for the second grade addition. Corrective action is not required.
X		A required sprinkler system is not provided for all janitor and custodial spaces. Corrective action is required.

I	LT	Reference
X		A required sprinkler system is not provided for the stage. Corrective action is required.
X		The kitchen hood is exhaust only type. Distance from cooking surfaces and edge of kitchen hood do not appear to comply with distance requirements. Kitchen hood duct protection is not fire resistive construction. The kitchen hood system is in poor condition. Corrective action is required.
X		A required fire suppression system is provided in the kitchen hood. Cooking equipment does have required shut down capability upon suppression system activation. Corrective action is required with hood replacement.
X		Provision of fire extinguishers within required travel distances do not appear to comply with life safety standards. Corrective action is required.
		3.7.2 Alarm Systems
X		The visual alarm system does not appear to comply with ADA guidelines or life safety standards. Visual alarms located 80 inches above the floor to the bottom of the lens are required in all corridors, common use spaces and rooms with more than one occupant. Corrective action is required. A fire alarm and annunciator panel is provided. A required smoke detector is provided in front of the panel. Corrective action is not required. Required pull stations are provided at emergency egress doors and are mounted at heights complying with ADA guidelines. Corrective action is not required.
		3.7.3 Corridor and Separation Walls
X		Exit corridor and area separation walls do not appear to have required firestopping sealing between wall and structural surfaces and framing or around wall penetrations. Ductwork penetrations do not appear to have required fire/smoke dampers. Corrective action is required.
		3.7.4 Doors
		Corridor doors, frames, hardware and assemblies do not appear to comply with life safety fire resistance rating standards. Corridor doors are required to have fire resistance rated construction and hardware assemblies. Corrective action is required. Refer to Section 3.6 for Opinions of Probable Costs of remediation. Area separation doors, frames, hardware and assemblies appear to comply with fire resistance rated construction requirements. Corrective action is not required.

I	LT	Reference
		Emergency exit doors, frames, hardware and assemblies appear to comply with emergency exiting requirements. Corrective action is not required.
		3.7.5 Classroom Emergency Exiting
		Operable window units and exit doors to building exterior provide classroom emergency exiting and appear to comply with emergency exiting requirements. Corrective action is not required.
		3.7.6 Emergency Egress Lighting
X		Corridor emergency egress lighting is not provided. Corrective action is required. Illuminated directional emergency exit signs are provided at every required location and are clearly visible. Corrective action is not required.
		3.8 Asbestos Concerns
		According to the AHERA Report, this facility does have asbestos-containing material (ACM). Remaining asbestos-containing material (ACM) is non-friable, not damaged, is inaccessible and is not hazardous to building occupants. ACM is located in floor tile and mastic, mechanical room equipment insulation and piping and fitting insulation.
	X	Removal of accessible ACM located in areas scheduled for renovation and replacement of affected flooring, ceilings, wall surfaces, piping and equipment insulation is recommended.

4.0 Opinions of Probable Costs to Remedy Physical Deficiencies (Van Voorhis Elementary)

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 are 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, Intermediate, and Long-term Remediation items are as follows:

Immediate	$ 1,365,000
Intermediate	$ 0
Long-term	$ 1,716,000
Total Remediation Costs	$ 3,081,000

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 $12,198,000. This cost was determined based on the following square foot cost escalated from TM 5-800-4:

$145.83/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 the 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 Van Voorhis is a combination of additions and the original 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 Van Voorhis Elementary School.

ESL (yrs)	AGE (yrs)	RUL (yrs)	PRV ($)	TARGET SUSTAIN (Annual $)	REMED. COSTS ($)	REQ'D INVEST. (Annual $)	MRM	RECOMMEND
67	*32.8	*34.2	12,198,000	182,100	3,081,000	90,100	.49	Renovate

*Represents Composite Number.

Based on our analysis of the remediation costs, it is our opinion that this school should be renovated to bring it into compliance with applicable codes and repair problems with major building systems.

Refer Appendix for Total Cost Summary

Refer Appendix for Immediate Remediation Item Detail Table

Refer Appendix for Long-Term Remediation Item Detail Table

VAN VOORHIS ELEMENTARY

Photo 1: Sign

Photo 2: Unsealed Corridor Wall at Roof Deck

Photo 3: Old Spencer Boilers

Photo 4: Upgrade Electrical Panels

Photo 5: Non-accessible Route to Parking

Photo 6: Damaged Masonry

3.0 System Description and Observations: Walker Intermediate School

I	LT	Reference
		3.1 Overall General Description
		This facility is a 55,000 square foot, one story building constructed in 1962. Subsequent additions were: • Classroom annex addition in 1985 • Media center in 1987 • Two chiller buildings in 1988 • Freezer building in 1997 This facility serves 300 students in grades four through six. Total student capacity is 401.
		3.2 Site
		3.2.1 Topography and Storm Water Drainage
		Slopes away from building appear to provide adequate drainage and the site does not appear to exhibit water-retaining problems. Corrective action is not required. Site storm water drainage is area drains and storm water drainage system. Roof downspouts connect to the storm water drainage system. The system does appear to be adequate for storm water control. Corrective action is not required.
		3.2.2 Paving, Curbing and Parking
		Parking area paving is asphaltic concrete in fair condition. Corrective action is not required.
	X	Parking areas do not appear to provide adequate parking spaces. Corrective action is required to add additional parking.
		3.2.3 Flatwork
	X	Concrete walkways are in fair condition. Corrective action is required to provide missing and deteriorated joint sealant.
	X	Walkways from drop-off areas between main building are protected by covered structures in poor condition. Corrective action is required.

I	LT	Reference
		3.2.4 Recreational Facilities and Title IX Compliance
		The school does not sponsor specific team sport programs and does appear to be in compliance with Title IX regulations. Corrective action is not required. Play fields for boy's and girl's field sports are available on-site and are in fair condition. Corrective action is not required. Play field lighting is not available and is not required for Title IX compliance. Corrective action is not required.
	X	A running and exercise track is provided and is in fair condition. Corrective action is required to repair cracks. A gymnasium provides indoor court sport recreational and assembly space. Corrective action is not required. Play areas are provided with various types of equipment in poor condition. Corrective action is not required.
		3.2.5 Utilities
		3.2.5.1 Water
		Domestic water main service (3" line) does appear to be adequate, with metering, and is in fair condition. Corrective action is not required.
X		A required backflow preventer on the main water service line is not provided. Corrective action is required.
		3.2.5.2 Natural Gas
		Gas service is multiple service, does appear to be adequate and is in good condition. It is located at the kitchen, the art wing and the gymnasium. Corrective action is not required.
		3.2.5.3 Sanitary Sewer
		Sewer service does appear to be adequate and is in fair condition. Corrective action is not required.
X		A two-compartment grease trap is not provided for kitchen waste piping. Corrective action is required.

I	LT	Reference
		3.2.5.4 Special Utility Systems
		Not applicable.
		3.2.5.5 Electrical Service and Metering
		Electrical service is multiple service with metering, is overhead, does appear to be adequate and is in fair condition. Corrective action is not required. The *National Electrical Code* (NEC) (Article 230-2) limits a single building to a single electrical service. There are exceptions allowed to provide more than one service, but the NEC required specific documented approval of the authority having jurisdiction. Multiple electrical service represent a safety hazard to maintenance personnel and a plaque or sign is required to be provided at each electrical service clearly indicating the locations where the other services to the building are located. This posting is considered a routine maintenance item.
		3.3 Structural Frame and Building Envelope
		3.3.1 Foundation
		The foundation is assumed to be reinforced concrete grade beams, supported by continuous spread and spot footings with concrete floor slab-on-grade in good condition. Corrective action is not required.
		3.3.2 Building Frame
		Building frame for the main building is concrete masonry unit walls and structural steel columns and beams in the classroom addition. Roof decking is structural metal, bulb tees and gypsum, and fibrous board. The structural system is in good condition. Corrective action is not required. Building frame for the freestanding media center is wood frame with wood joists and trusses. Roof decking is plywood sheathing. The structural system is in good condition. Corrective action is not required.
		3.3.3 Facades or Curtainwall
		3.3.3.1 Sidewall System
	X	Building exterior is face brick masonry veneer in fair condition. Masonry exhibits surface deterioration, stress cracking, missing and damaged masonry units, deteriorated joint sealant, efflorescence, soiling, staining and algae growth in various locations. Repair and replacement of damaged masonry, grout, joint sealant and surface cleaning is recommended.

I	LT	Reference
		Building exterior on the upper gymnasium is exterior insulation and finish system (EIFS) in fair condition. EIFS exhibits soiling. Repair and replacement of damaged areas and general cleaning is recommended. However, corrective action is not required.
		3.3.3.2 Entrances/Exits
		Main entrance/exit is pre-finished anodized aluminum doors and framing with glazing in good condition. Corrective action is not required. Auxiliary exit/entrances are painted hollow metal doors and frames with glazing in fair condition. Corrective action is not required.
		3.3.3.3 Fenestration System
		Fenestration system is pre-finished anodized aluminum framing with tinted and untinted double glazing and pre-finished metal spandrel panels in good condition. Corrective action is not required.
		3.3.3.4 Soffits
		Soffits at main entrance/exit, auxiliary exit/entrances, and roof overhangs are pre-finished aluminum in good condition. Corrective action is not required.
		3.3.3.5 Parapets
		Areas with parapets are extensions of the indicated wall systems and are protected with metal coping in fair condition. Repair and replacement of damaged metal coping is recommended. Costs are included in 3.3.4.
		3.3.4 Roofing
X		Low slope fully adhered EPDM is located on the original building and is in fair condition. Major leaks are not evident. Corrective action is required to repair damaged seams. Sloped pre-finished standing seam metal roofing is located on the gymnasium and is in good condition. Leaks are not evident. Corrective action is not required. Sloped composition shingle roofing is located on the classroom addition and is in poor condition. Leaks are evident. Corrective action is required. Flashing, coping, fascia, gutters and downspouts are pre-finished metal in fair condition. Corrective action is required.
X		
X		

I	LT	Reference
		3.4 Interior Elements
		3.4.1 Common Areas
		Lobbies and Corridors: Flooring is vinyl tile in fair condition. Walls are glazed concrete masonry unit wainscot and concrete masonry units, concrete masonry units and gypsum board in fair condition. Solid ceilings and furring are gypsum board in fair condition. Suspended acoustical lay-in panel ceilings are in poor condition. Public, Private and Classroom Toilets: Flooring is ceramic tile in good condition. Walls are glazed concrete masonry unit wainscot and concrete masonry units and concrete masonry units in fair condition. Solid ceilings and furring are gypsum board in fair condition. Suspended acoustical lay-in panel ceilings are in fair condition. Administrative Areas, Media Center and Classrooms: Flooring is vinyl tile and carpet in fair condition. Walls are concrete masonry units and gypsum board in fair condition. Solid ceilings and furring are gypsum board in fair condition. Suspended acoustical lay-in panel ceilings are in fair condition. Cafeteria: Flooring is finished wood in fair condition. Walls are glazed concrete masonry unit wainscot and concrete masonry units and concrete masonry units in fair condition. Solid ceilings and furring are gypsum board in fair condition. Suspended acoustical lay-in panel ceilings are in poor condition. Gymnasium: Flooring is finished wood in fair condition. Walls are glazed concrete masonry unit wainscot and concrete masonry units in fair condition. Solid ceilings are exposed structure and decking in good condition. Stage: Flooring is finished wood in fair condition. Walls are glazed concrete masonry unit wainscot and concrete masonry units in fair condition. Suspended acoustical lay-in panel ceilings are in fair condition.

I	LT	Reference
		Kitchen: Flooring is ceramic tile in good condition. Walls are glazed concrete masonry unit wainscot and concrete masonry units in fair condition. Solid ceilings are plaster in fair condition. General: Replacement of finishes affected by asbestos abatement is required.
	X	
		3.5 Mechanical and Electrical System
		3.5.1 Overall General Description
X		The HVAC System for the majority of the school includes rooftop cooling only air handling units served by chilled water. The chilled water serving these rooftop units originates from two Chiller Buildings, each with interior Trane water chiller and rooftop condenser. These cooling systems appear to be in good condition. Heating is accomplished by means of perimeter unit ventilators and fan and coil units utilizing gas fired heating hot water boilers generated from the Main Boiler Room. Hot water is distributed by multiple zone pumps. The two existing Spencer boilers are old and are reaching the end of their useful life. Corrective action is required.
X		The Art Wing Addition is served by individual classroom unit ventilators with chilled water from a small packaged air cooled chiller and heating hot water from a small boiler. The gas fired hot water heating boiler appears to have severe corrosion and should be replaced. The detached Gymnasium is served by a hot water heating boiler serving a central suspended air handling unit. The air handling unit can provide a large amount of fresh air to the building, but it does not have the capability to provide cooling. This system is in fair condition and remediation is not required at this time.
X		Temperatures and various control elements are monitored by the base wide Johnson Controls "Metasys" system. The existing primary temperature control system is pneumatic and obsolete. A project is underway to convert the controls to DDC, but is not yet funded. Corrective action is required.
		3.5.2 Plumbing System
		3.5.2.1 Plumbing Supply and Waste Piping
		Water supply and waste piping within the facility does appear to be adequate and is in fair condition. Corrective action is not required.

I	LT	Reference
		3.5.2.2 Domestic Hot Water Production
		Domestic hot water is provided by two 100-gallon, gas-fired water heaters in poor condition. Corrective action is required as stated in Section 3.5.1.
		3.5.2.3 Fixtures
	X	Plumbing fixtures and connections appear to be adequate and are in fair to poor condition. The plumbing fixtures in the original main building will require replacement as they are over 40 years old. Corrective action is required.
		3.5.2.4 Fuel Piping
		Not applicable.
		3.5.3 Mechanical System
		3.5.3.1 Main Service
		The main electrical distribution panel for the Main Boiler Room is a 1,200-amp, 120/208-volt, 3-phase, 4-wire panel. The panel does not appear to be adequate and is in fair condition. Corrective action is not required. The main electrical distribution panel for the Chiller Buildings is a 1,200-amp, 120/208-volt, 3-phase, 4-wire panel. The panel does appear to be adequate and is in good condition. Corrective action is not required. The main electrical distribution panel for the Art Wing Addition is a 400-amp, 120/208-volt, 3-phase, 4-wire panel. The panel does appear to be adequate and is in good condition. Corrective action is not required. The main electrical distribution panel for the Gymnasium is a 325-amp, 120/208-volt, 3-phase, 4-wire panel. The panel does appear to be adequate and is in good condition. Corrective action is not required.
		3.5.3.2 Distribution and Panels
X		Electrical distribution and branch panels appear to be inadequately sized and are in poor condition in the original main building. Other panels are in good to fair condition. Corrective action is required.

I	LT	Reference
		3.5.3.3 Interior Lighting
		Administrative area, media center and classroom lighting is recessed fixtures with fluorescent lamps in good condition. Fluorescent lamps are T-8. Light levels appear to be adequate. Corrective action is not required. Corridor lighting is recessed fixtures with fluorescent lamps in good condition. Light levels appear to be adequate. Corrective action is not required.
		3.5.3.4 Exterior Lighting
	X	Exterior lighting is provided and is metal halide lamps in poor condition. Lighting levels do not appear to be adequate and only provide sporadic coverage. Corrective action is required.
	X	Soffit and entrance lighting is provided and is recessed fixtures with incandescent lamps in poor condition. Lighting levels do not appear to be adequate. Corrective action is required. Covered walkway lighting is provided and is adequate where installed. Corrective action is not required.
	X	Parking lot lighting is provided and is wall pack lighting from the building and is generally inadequate. Lighting levels do not appear to be adequate, particularly at the new parking lot. Corrective action is required.
		3.5.3.5 Security System
		A security system is provided and is monitored by a central agency. The security system does appear to provide adequate security and is in good condition. Corrective action is not required.
		3.5.3.6 Intercom System
		Intercom system does allow communication to individual classrooms. The system is in fair condition. Corrective action is not required.
		3.5.3.7 Educational Television
		Educational television is provided and does allow internal broadcasting. The system is in good condition. Corrective action is not required.

I	LT	Reference
		3.5.3.8 Computer Network
		A computer network system provides adequate LAN outlets for each classroom. The computer network system does appear to be adequate and is in good condition. Corrective action is not required.
		3.6 ADA Tier I: Visual Accessibility Survey
		3.6.1 Path of Travel
X		A required adequately marked accessible route from parking is provided. One accessible route is required from the boundary of the site from public transportation stops, accessible parking spaces, passenger loading zones, public streets or walkways to an accessible building entrance. Corrective action is required.
X		Curb ramps on approaches to the facility from student drop-off areas and parking are provided and do not appear to comply with accessibility guidelines. Curb ramps along the accessible route are required to have compliant slopes and detectable warnings. Corrective action is required. The walkway approach to main entrance doors does appear to provide accessible slopes without threshold entry restrictions. Corrective action is not required. Ramps along the on-site accessible route are not required and are not provided. Corrective action is not required.
X		Ramps along the interior accessible route are required and are provided. Ramps do not appear to comply with accessibility guidelines. Required handrails are not provided. Corrective action is required. Relocation of one classroom door will be required to avoid conflicts with corridor ramp.
		3.6.2 Parking
X		Required accessible parking for cars and vans is not provided. Parking areas require marked spaces based on 1 accessible space for each 25 spaces, a minimum of one van accessible space for each 8 accessible spaces with slopes not exceeding 1:50 (2%) in all directions, access aisles, signage and marked accessible route. Corrective action is required.
		3.6.3 Entrances/Exits
		Main entrance/exit approach, doors and hardware appear to comply with accessibility guidelines. A minimum of one door or series of doors must comply with accessibility guidelines with adequate maneuvering, width and opening clearances from both sides with non-restrictive hardware and closers. Corrective

I	LT	Reference
		action is not required.
	X	Some auxiliary exit/entrance doors exit to porches that do not appear to provide exiting. Exit/entrances are required to be accessible by construction of porches, ramps, handrails or site regrading. Corrective action is required.
X		Interior doors along the accessible route are flush with corridor walls and appear to allow clearance and approach accessibility. At least one door is required for each accessible space with adequate maneuvering, width and opening clearances from both sides. Corrective action is required.
X		Door assemblies do not appear to meet accessibility guidelines. All doors to accessible spaces are required to have non-restrictive hardware and closers. Corrective action is required.
		3.6.4 Signage
	X	Signage along the accessible route does not appear to comply with accessibility guidelines. Signage is required at all designated parking spaces, along the marked accessible route and building interior. Signage with raised Braille characters is required at all doors designating permanent rooms or spaces. Corrective action is required.
		3.6.5 Public Toilet Rooms
X		Public toilets are provided along the accessible route and do not appear to comply with accessibility guidelines. Public toilets are required to provide accessible entry, maneuverability, clear floor space and accessible fixtures, accessories, controls, partitioned stalls and recessed insulated lavatory piping. Corrective action is not required.
	X	Administrative staff and nurse's toilets do not appear to meet accessibility guidelines. Toilets are required to comply with guidelines similar to public toilets. Corrective action is required.
		3.6.6 Drinking Fountains
X		Drinking fountains are provided along the accessible route and do not appear to comply with accessibility guidelines. Drinking fountains are required to be accessible with adequate clearances and corridor protrusion protection. Corrective action is required.

I	LT	Reference
		3.6.7 Telephones
		Not applicable.
		3.6.8 Elevators/Lifts
X		Elevators are not required. A required platform/wheelchair lift is not provided at the stage. Corrective action is not required.
		3.6.9 Recreational Facilities
		Required accessible routes to play areas are provided. Accessible play areas, equipment and surfacing appear to be available in individual play area groups. ADA guidelines require a minimum of one play area with an accessible route, equipment and accessible surfacing material for each play area group. Corrective action is not required.
		3.7 Life Safety and Fire Protection
		3.7.1 Sprinklers, Standpipes and Fire Suppression Systems
X X X X X		A sprinkler system is provided for the Art Wing. Corrective action is not required. A required sprinkler system is provided for most janitor and custodial spaces. Corrective action is required to include all spaces. A required sprinkler system is not provided for the stage. Corrective action is required. The kitchen hood is exhaust only type. Distance from cooking surfaces and edge of kitchen hood do not appear to comply with distance requirements. Kitchen hood duct protection is not fire resistive construction. Corrective action is required. A required fire suppression system is provided in the kitchen hood. Cooking equipment does have required shut down capability upon suppression system activation. Corrective action is required with hood replacement. Provision of fire extinguishers within required travel distances do not appear to comply with life safety standards. Corrective action is required.

I	LT	Reference
		3.7.2 Alarm Systems
X		The visual alarm system does not appear to comply with ADA guidelines or life safety standards. Visual alarms located 80 inches above the floor to the bottom of the lens are required in all corridors, common use spaces and rooms with more than one occupant. Corrective action is required. A fire alarm and annunciator panel is provided. A required smoke detector is provided in front of the panel. Corrective action is not required. Required pull stations are provided at emergency egress doors and are mounted at heights complying with ADA guidelines. Corrective action is not required.
		3.7.3 Corridor and Separation Walls
X		Exit corridor and area separation walls do not appear to have required firestopping sealing between wall and structural surfaces and framing or around wall penetrations. Borrowed lights do not appear to have fire resistive construction. Corrective action is required.
		3.7.4 Doors
		Corridor doors, frames, hardware and assemblies do not appear to comply with life safety fire resistance rating standards. Corridor doors are required to have fire resistance rated construction and hardware assemblies. Corrective action is not required. Refer to Section 3.6 for Opinions of Probable Costs of remediation. Area separation doors, frames, hardware and assemblies appear to comply with fire resistance rated construction requirements. Area separation doors are required to have fire resistance rated construction, smoke detectors, hardware and assemblies. Corrective action is not required. Emergency exit doors, frames, hardware and assemblies appear to comply with emergency exiting requirements. Emergency exit doors are required to have non-restrictive emergency exit hardware and assemblies. Corrective action is not required.
		3.7.5 Classroom Emergency Exiting
		Operable window units to building exterior provide classroom emergency exiting and appear to comply with emergency exiting requirements. Corrective action is not required.

I	LT	Reference
		3.7.6 Emergency Egress Lighting
X		Emergency egress lighting is not provided. Corrective action is required.
		3.8 Asbestos Concerns
		According to the AHERA Report, this facility does have asbestos-containing material (ACM). Remaining asbestos-containing material (ACM) is non-friable, not damaged, inaccessible and is not hazardous to building occupants. Corrective action is not required.
	X	Removal of all ACM and replacement of affected flooring, ceilings, and wall surfaces is required.

4.0 Opinions of Probable Costs to Remedy Physical Deficiencies (Walker Intermediate)

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, 60 th 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 are 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, Intermediate, and Long-term Remediation items are as follows:

Immediate	$ 1,395,000
Intermediate	$ 0
Long-term	$ 540,000
Total Remediation Costs	$ 1,935,000

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 $8,199,000. This cost was determined based on the following square foot cost escalated from TM 5-800-4:

$149.15/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 the 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 Walker is a combination of additions and the original 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 Walker Intermediate School.

ESL (yrs)	AGE (yrs)	RUL (yrs)	PRV ($)	TARGET SUSTAIN (Annual $)	REMED. COSTS ($)	REQ'D INVEST. (Annual $)	MRM	RECOMMEND
67	*35.5	*31.5	8,109,000	122,400	1,935,000	61,400	.50	Renovate

*Represents Composite Number.

Based on our analysis of the remediation costs, it is our opinion that this school should be renovated to bring it into compliance with applicable codes and repair problems with major building systems.

Refer Appendix for Total Cost Summary

Refer Appendix for Immediate Remediation Item Detail Table

Refer Appendix for Long-Term Remediation Item Detail Table

WALKER INTERMEDIATE SCHOOL

Photo 1: Entrance

Photo 2: Cracked Masonry

Photo 3: Damaged Roof

Photo 4: Non-compliant Toilet Room

Photo 5: Old Boilers

Photo 6: Damaged Composition Shingle