DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, HONOLULU DISTRICT
FORT SHAFTER, HAWAII 96858-5440

February 28, 2012

REPLY TO
ATTENTION OF:

OFFICE OF INSULAR AFFAIRS
ASSESSMENT OF BUILDINGS AND CLASSROOMS (Insular A, B, C's)
Briefing Paper for the Interagency Group on Insular Areas

Background

The Insular A, B, C's - Phase II initiative announced by U.S. Department of the Interior, Assistant Secretary for Insular Areas, Anthony Babauta on March 17, 2011, represents a partnership between the governments of Guam, the Commonwealth of Northern Marianas, American Samoa, the U.S. Virgin Islands and the Office of Insular Affairs (OIA), to conduct a baseline inventory and deferred maintenance assessment of 125 public elementary, middle and high schools comprising of approximately 1,600 buildings.

Key Points

- OIA has requested the assistance of the U.S. Army Corps of Engineers, Honolulu District and its consultant Helber Hastert & Fee to conduct the Insular A, B, C's work. The project was divided into a two phased approach, initiated in August 2010.

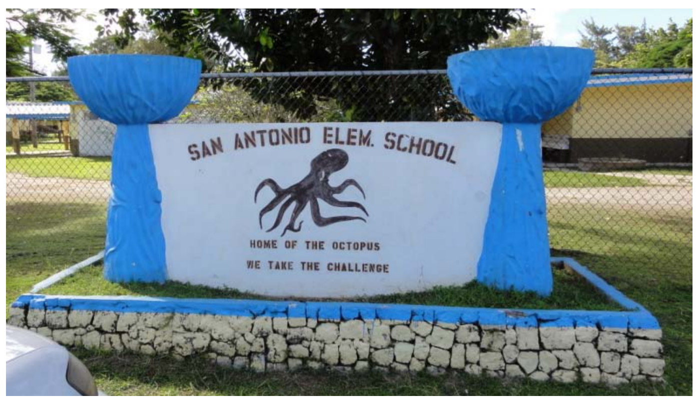
- The Phase I Insular A, B, C's Report was completed in February 2011. The report developed a framework and assessment process for Phase II, relevant to the needs of each territory based on an inventory of facilities and stakeholder input on processes and needs.

- Phase II of the Insular A, B, C's initiative will produce valuable insights for leadership decision making, including the overall physical condition of all school facilities; an accounting of deferred maintenance and replacement values to assist in capital investment decisions; and, identifying trends in maintenance practices and requirements to pinpoint opportunities for efficiencies. Information collected under this initiative will be stored in a centralized information system, allowing each territory to access its own school system data and take advantage of built-in cost modeling, location/GIS mapping, project planning and work order management tools. By conducting the initiative as a regional effort, insular governments will be able to address many of their school systems' needs for maintenance planning, maintenance tracking, and capital planning in a systematic and cost effective manner.

- Additional environmental parameters will be captured for each school to assist managers in prioritizing repair and maintenance investments. These parameters include school grounds conditions (pavement condition, fencing, drainage issues, etc.), natural hazards (flood plain, landslide risk, tsunami inundation, etc.), and emergency response (e.g., is the facility identified as an emergency evacuation center?). Other context parameters such as student enrollment, student/teacher ratios, student/classroom ratios, etc., could also be collected and maintained to inform the evaluation and prioritization process.

U.S. INSULAR AREAS EDUCATION FACILITY INVENTORY AND CONDITION ASSESSMENT STUDY

PHASE 1 REPORT



FEBRUARY 2011

U.S. DEPARTMENT OF INTERIOR
OFFICE OF INSULAR AFFAIRS

EA/HHF Joint Venture

US Army Corps of Engineers

U.S. INSULAR AREAS
EDUCATION FACILITY INVENTORY
AND CONDITION ASSESSMENT STUDY

PHASE 1 REPORT

February 2011

Prepared by:
EA/HHF Joint Venture

Under contract with:
US Army Corp of Engineers, Honolulu District

Prepared for:
US Department of Interior, Office of Insular Affairs

Contents

Appendices

*A disk containing Inventory and GIS data is included in the back cover of this report

Executive Summary

The US Department of Interior's five-year strategic plan includes a new goal to Improve Quality of Life in the insular areas -- with a focus on improving education. DOI's Office of Insular Affairs is charged with developing the metrics to allow the Secretary to monitor progress in improving school facility conditions for Guam, Commonwealth of Northern Marinas Islands, American Samoa and the US Virgin Islands. This "Phase 1" report is the first of two steps to provide OIA with the tools to support this initiative. The report summarizes the existing institutional context, the basic facilities inventory and common facilities condition problems, alternative approaches to developing the metrics, and the recommended approach and budget to implement the program.

Facilities planning for school districts in the insular areas are currently conducted at a very rudimentary level. While there is some variation within the districts, it's apparent that repair and maintenance of school facilities is not considered a high priority (i.e., no standing legislative appropriations; no vision or policy basis to close, consolidate or expand schools to more efficiently provide public school services -- or relocate schools from natural hazard areas; outdated or nonexistent school CIP plans; bifurcated planning, design and procurement functions; lack of standard designs; overemphasis on initial costs rather than life cycle costs; absence of preventative maintenance programs, etc.). In short, the territories lack the institutional capacity to manage and sustain their school district facilities. Because of its central role in insular school facility funding, OIA is in a strategic position to develop standards and assist the territories in implementing these institutional changes.

The Phase 1 effort established the preliminary facilities inventory needed to develop and implement the school condition program. There are a total of 125 schools (approximately 1,561 separate buildings) in the four territories, with average age in the range of 40 years. Total school enrollment is estimated at 70,750 students (K-12). The insular school facilities share a number of common problems involving moisture penetration, structural problems, inadequate electrical systems, failing on-site infrastructure and functional obsolesce due to the age of the facilities. School principals are forced to allocate a large share of their time to address facilities management problems. District maintenance personnel are preoccupied responding to trouble calls instead of designing and implementing long range preventative maintenance programs.

A number of facility condition models were evaluated as part of the Phase 1 study, including the Bureau of Indian Affairs "FCAP" model. All models are generally based on the ratio of current replacement value to deferred maintenance backlog (e.g., building with high ratios (i.e., costs of needed repairs are high relative to replacement value) are considered to be in poor condition). Since OIA's major objective is for senior executive overview of facility condition, more expensive models focused on generating detailed repair and maintenance work orders typically used by facility managers (such as the BIA model) were eliminated in favor of those that provided more cost effective and reliable high level metrics.

A refinement of NASA's Deferred Maintenance Parametric Estimating Guide was selected as the most cost effective approach. The Phase 2 study would be conducted in two steps:

- Phase 2A involves a checklist-driven baseline condition survey which would develop a ranking for each building and school with in the territories on a scale of 1 to 5 (bad to excellent), an accompanying estimate of the deferred maintenance backlog and standup of the executive level "dashboard" of tools to visualize and monitor trends in school conditions. This phase would take approximately 14 months to complete within an estimated budget of $2.5 million.

- Phase 2B involves periodic school reinspections required to evaluate facility condition trends (i.e., building/campus "x" condition ratio increased from 3.2 (Fair) to 4.1 (Good)). This phase would be conducted annually within a budget of $325,000/year.

A Pre-Final Report was circulated for review by OIA personnel in December 2010. Review comments and resultant actions are provided in Appendix F.

1. Introduction

Study Purpose

Ensuring that the youth of the territories of U.S. Virgin Islands, Guam, the Commonwealth of the Northern Mariana Islands (CNMI), and American Samoa (study area) receive a quality education is a top priority shared by Territorial administrators and the Office of Insular Affairs (OIA). To underscore the importance of this commitment, the Department of Interior's new strategic plan includes a new goal to Improve Quality of Life in the insular areas, with a focus on improving education.

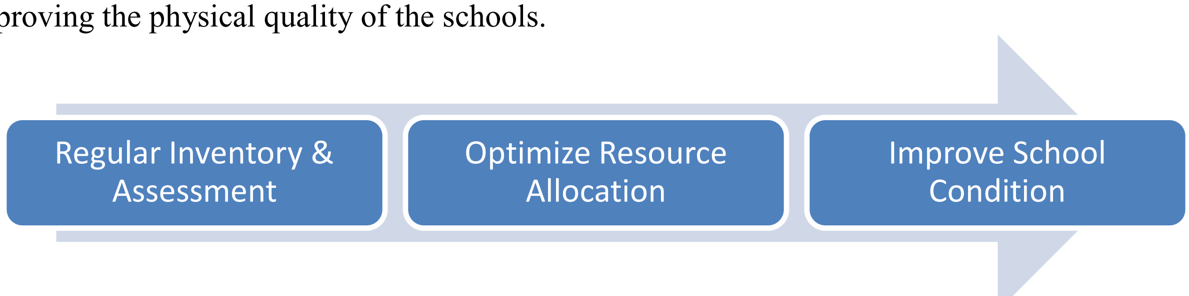
OIA believes a regular school facility condition assessment will augment existing capital planning efforts and provide valuable insights that can assist territorial leaders in making difficult school facility investment decisions. OIA has embarked on a two-phase effort to implement the assessment. This study documents the results of Phase 1 which included the following basic tasks:

- Initial fact-finding and stakeholder consultation
- Familiarization with territorial school facilities maintenance issues
- Initial school facility data collection
- Define Phase 2 school condition survey assessment methodology

Need for the Study

A unified system for documenting and monitoring facility conditions of territorial schools does not exist. Such a system is needed to provide indications of the adequacy and effectiveness of the resources devoted to facilities maintenance.

A regularly updated condition inventory can improve facility management resource allocation by identifying long range budgets and providing an overall facility condition index or ranking system to identify those facilities most in need of repair. If the condition inventory is accompanied with a robust, locally-based preventative maintenance program, the functional life of facilities can be extended, reducing recurring repair and maintenance costs over time, thereby improving the physical quality of the schools.



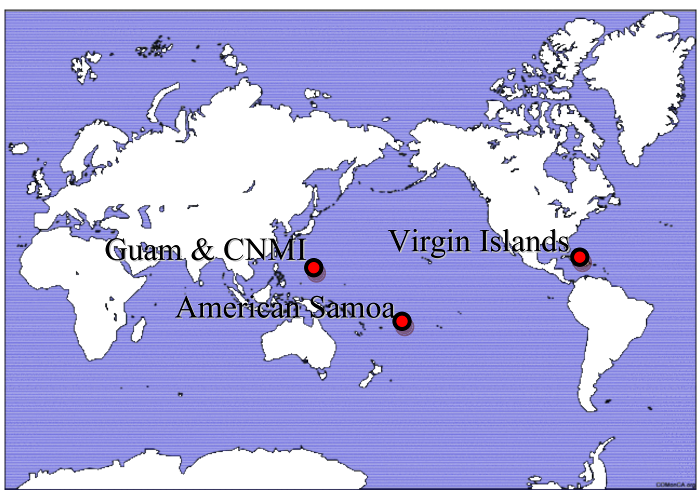
Process Improvement Diagram

Studies show that deferred maintenance[1] causes premature facility degradation. By documenting and ranking the systems that comprise campus facilities, maintenance deficits can be more accurately targeted and improved. Monitoring these efforts will affirm system success or detect deficiencies. Implementing a system that demonstrates positive progress will build confidence and support for the system. Support for the facility management program is critical to successful facility maintenance.

This study identifies an appropriate method for inventorying insular school facilities, ranking their condition and estimating the extent and costs of deferred maintenance (DM).

Geographic Setting

The study area is comprised of the US Virgin Islands, located on the western edge of the Atlantic Ocean in the Caribbean Sea; Guam and CNMI in the western Pacific Ocean, and American Samoa in the South Pacific. The study area spans a broad area of the globe but essentially is comprised of small insular areas within the tropics (e.g., harsh oceanic climates) with similar challenges relating to their remoteness from major markets (e.g., building supplies and technical expertise), relatively small, dispersed population bases with limited economic development activity, and all very dependent on the federal government for support. Another common denominator within study area territories is the high risk of natural disasters (e.g., tsunami, hurricanes and earthquakes), which results in reduced facility life and adds a significant stressor to the normal functioning of the local governments.

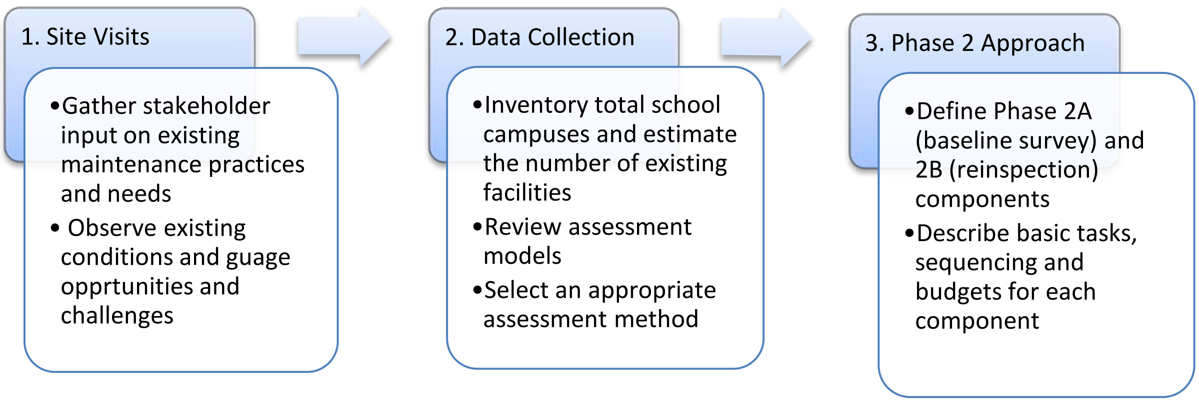


Study Area

[1] The Federal Accounting Standards Advisory Board (www.FASAB.gov) defines deferred maintenance as *"Deferred maintenance" is maintenance that was not performed when it should have been or was scheduled to be and which, therefore, is put off or delayed for a future period. For purposes of this standard, maintenance is described as the act of keeping fixed assets in acceptable condition. It includes preventive maintenance, normal repairs, replacement of parts and structural components, and other activities needed to preserve the asset so that it continues to provide acceptable services and achieves its expected life. Maintenance excludes activities aimed at expanding the capacity of an asset or otherwise upgrading it to serve needs different from, or significantly greater than, those originally intended.* Statement of Federal Financial Accounting Standard 6.

Phase 1 Overview

Phase 1 included the concurrent undertaking of site visits, information gathering from interviews and secondary research, facility condition assessment model research, and a general approach, budget and framework for Phase 2. These basic steps are schematically represented below:



Initial fact-finding and data collection included stakeholder consultation and school site visits as well as internet based research. These investigations resulted in inventory data, higher awareness of the range of facility condition assessment processes and current state of the practice, and a deeper understanding of the political structure of maintenance project funding and agency management.

School site visits and stakeholder interviews were crucial components of Phase 1 and helped to clarify the need for and value of comprehensively assessing school facility conditions. Facility sustainment budgets are grossly inadequate and a significant backlog of DM projects was observed. Identifying DM backlog budgets on a large scale will help justify funding requests and focus local efforts to improve school facility conditions.

The primary objectives of Phase 1 were to develop an assessment process relevant to Territorial needs and estimate Phase 2 budgeting based on facility inventory and assessment requirements. This Phase 1 study report includes the following major sections:

- Section 2 provides a summary of Phase 1 fact-finding and preliminary facility inventory, including total number of campuses and locations and an estimated number of facilities.
- Section 3 provides a summary of the research and recommendations for the Phase 2 condition assessment model (based on NASA's Deferred Maintenance Parametric Estimating Guide). A more detailed review the DM assessment process is provided in Appendix A – Program Fundamentals of the Selected Assessment Method.
- Section 4 describes the overall approach for Phase 2 and its two sub phases: Phase 2A involving the initial baseline facility condition baseline survey and Phase 2B, the periodic "reinspection" surveys to track facility condition trends.
- Section 5 summarizes collateral issues that OIA will need to consider as it moves forward with its school facility condition initiative.

A Pre-Final Report was circulated for review by OIA personnel in December 2010. Review comments and resultant actions are provided in Appendix F.

2. Preliminary Findings and Inventory

Findings

All four territories were visited in the last four months of 2010 as part of the Phase 1 fact-finding effort, as summarized below:

Territory	Dates
American Samoa	5-9 September 2010
CNMI	25-27 October 2010
Guam	28-30 October 2010
US Virgin Islands	30 November – 7 December 2010

A common approach for each visit was to first meet with the OIA field representative and then in-brief the local DOE commissioner or superintendent, consult with staff involved in school facility maintenance, and, to the extent possible, gain familiarity with each territory's public schools. The average on-site duration was about three days which did not permit much time to visit schools, although a number of visits were guided by knowledgeable local DOE staff and a number involved significant interaction with school principals -- which underscored the corporate wisdom both the local DOE staff and the principals hold and the need to engage them in the Phase 2 effort. Trip reports from each of the site visits were prepared and are compiled in Appendix E along with various meeting records and information handed out at the various meetings.

Common Opportunities

The school officials and staff interviewed in the Phase 1 assessment-- for the most part-- were highly professional and obviously fully committed to their school systems; all making the best of the resources they were provided with. Most of the school districts are engaged in the federal E-Rate program authorized as part of the Telecommunications Act of 1996 (provides affordable telecommunication and internet access funded through an access fee charged to interstate and international telecommunications companies). CNMI and USVI have energy and water conservation programs underway to increase energy efficiency and install low flow water fixtures (these can be somewhat superficial improvements if not extended into the underlying backbone systems—but nonetheless important initiatives). Utility bills are increasing across the country, forcing school districts to implement conservation measures to minimize program cuts. CNMI is also experimenting with wind and solar power generation applications at some of its schools.

Common Challenges

All of the School Districts are short staffed and underfunded. In the facilities condition assessment vernacular – most are operating at the extreme right of the maintenance spectrum, placing most of their effort in responding to trouble calls as opposed to developing and executing preventative maintenance plans and only occasionally responding to trouble calls. All DOE administrators need to compete with other governmental agencies for a fair share of the State budget and with few exceptions, there are no standing legislative appropriations for repair and maintenance functions (American Samoa has a formal set-aside program reserving a portion of capital funds and an excise tax levy for maintenance purposes). Some jurisdictions seem very motivated and exhibit a high degree of esprit de corps and others seem to struggle with internal politics and turnover.

The general set of problems facing the insular schools includes an aging physical plant with increasing functional obsolescence, accelerated wear from the corrosive coastal environment and lack of a preventative maintenance program. Local utility service providers have problems providing reliable power and water services to the school. Most schools are not compliant with current codes (e.g., seismic and high wind standards, ADA, ACM/LBP issues, etc.). The standard set of Deferred Maintenance items includes, in no particular order:

- Moisture penetration (from roofs, walls, foundations, and nearby cisterns) and related poor indoor air quality and damage to FF&E
- Various stages of structural failure (spalling, column and beam cracking or deflection, extreme rust, etc.)
- Flooding problems (from nearby roads, drainage ways, upstream diversions and failing onsite drainage infrastructure)
- Air condition system inadequacy/obsolescence (or nonexistence)
- Electrical system inadequacy (ranging from lack of floor plugs to the need for backup generators and new transformers)
- Termite damage (some territories more extensive than others)
- Domestic water cistern problems (ubiquitous throughout the territories although now more of a liability than an benefit)
- Broken or inadequate bathroom fixtures
- Inadequate emergency access
- Corroded cast iron water mains
- Nonexistent or inadequate parking areas
- Fence-line issues including encroachment and boundary questions (and lack of perimeter fences)

School principals are forced to allocate a large share of their day to dealing with these facility management problems – time better spent on student, faculty and staff issues.

Expectation Management

A common concern raised by senior executives about the planned OIA initiative was how to manage expectations, both within and without the school community. The Phase 2 school inspections will receive a lot of public scrutiny (building inspectors will be “on island” for weeks at a time in very visible locations). What happens if it becomes known that OIA has determined that a school is in "bad" condition? Does that school have an expectation that conditions will be improved within some reasonable period of time? Does the OIA initiative – to improve the condition of insular schools—come with improvement funds or will it be up to the local governments to restructure funding priorities? The "what next?" questions were uppermost in many interviewees minds. The bottom line was that OIA will need to develop and implement a comprehensive communications strategy as part of its Phase 2 initiative to provide appropriate information at various levels of the community to unify and strengthen support. Without a strong program, rumors and innuendo will inevitably take over and perhaps damage the credibility of the program.

Lack of a Comprehensive School Facilities Inventory

One of the important objectives of the Phase 1 effort was to develop a basic, comprehensive facilities inventory of school facilities based largely on information acquired from each of the territories. Several follow-on information requests are outstanding at the time of publication – most notably from American Samoa and Guam which have reduced the efficacy of this report. As has been noted in several of the trip reports, all the territories do not maintain detailed, comprehensive facility inventories (e.g., site plans of all campuses indicating building locations, gross floor area, construction type use and year built). The information is available for some campuses within a territory and not others, making it impractical to use in a comprehensive application. The most comprehensive data set achievable for Phase 1 consists of aerial photo-derived building footprint data, cross checked to the extent possible with site plan and other types of data collected during Phase 1. The building and cruder floor area data summarized in the next section is sufficient to determine the on-the-ground level of effort needed to complete the Phase 2 facility condition assessment. Phase 2 will need to include additional data collection on building types during pre planning and as part of the school inspections, to properly calibrate the cost model (picked onsite from a predefined list), and will also act as a cross check on the building and floor area data compiled in Phase 1.

Need for Long Range School Facility CIP Plans

All of the territories are faced with planning challenges including dealing with under and overcapacity schools, a common reluctance to consider school closure or consolidation and competing with other governmental services for a fair share of the budget. A striking problem was the near universal lack of current CIP plans or any type of planning framework for that matter--for school facilities (exceptions are CNMI PSS which is in the process of updating its 2005 plan and GDOE which is apparently updating its well regarded 1999 CIP plan).

Lack of Facility Standardization

Another striking issue was the lack of standardization in school layouts and configurations. Each new school is built with a completely different design. The lack of standardization at least around a few common templates raises significant R&M challenges where building systems are always different and inventory requirements are overwhelming. There are some exceptions like some of the US VI's St Croix schools but these are rare. A great opportunity exists to develop standard plans and material specifications for insular schools.

Vision of "the Classroom of the Future"

The average age of school facilities is in the range of 40 years (anecdotal information provided by the facility managers). The contemporary vision of the modern school environment is far different than that perceived in the 50's and 60's when most of the school facilities were being designed. To the extent a major recapitalization of the insular schools is forthcoming, it is critical that the reinvestment be forward looking – towards the teaching environment of the future – and not just patching and repairing functionally obsolete facilities. To this end (and it parallels the "standardization" discussion above), it would be opportune for OIA to foster discussion of what the insular schools of the future should look like and work with the territories to develop prototypes and models to emulate.

Need for Standardized Approach for Facility Maintenance Functions

There is no standardized approach to school facility maintenance programs within the territories. All territories rely on DOE facilities maintenance staff but some also rely on Public Works technical staff and there is a history of migrating responsibilities between these two agencies, resulting in a significant diminishment of corporate memory. Some DOE's base maintenance staff at schools while others choose to centralize them. Some empower principals to retain outside contractors while others funnel work orders through a centralized staff. The use of technology such as relational databases to store facility data and digital drawing libraries is at a very rudimentary level (or non-existent in some territories). The bottom line is that there is no standardization in this important function and in general, limited institutional capacity to maintain school facilities.

Inventory

A major objective of Phase 1 was to gather available information and develop a preliminary inventory of school facilities. This section is divided into two subsections: General comparative information between the four territories is presented first followed by summary information for each of the territories.

As noted earlier, the study area encompasses four independent public school systems. Early inventory data gathering for this project provides the following summary statistics:

- 70,750 total K-12 student enrollment in subject public schools
- 125 campuses (including three annexes located separately from base school campuses)
- 1,561 total buildings

Student Enrollment

As shown below, Guam has by far the largest student enrollment (43% of total study area enrollment of 70,750), followed by US VI, American Samoa and CNMI (15% of total study area enrollment). Guam also has a significantly higher average number of students per school.

Chart 1 – Percent Student Enrollment

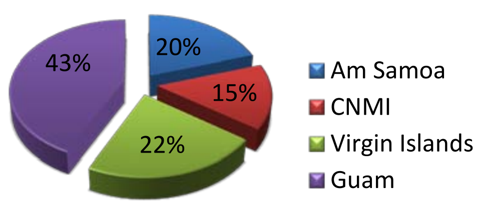
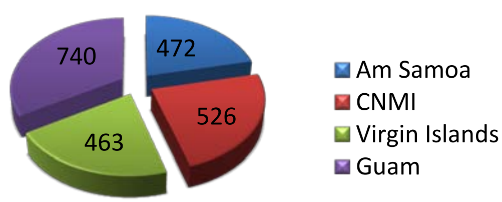


Chart 2 – Student per School Average



School Campuses

Elementary schools comprise more than two thirds of total campuses in the study area, with Guam contributing the highest number of public school campuses (33%).

Chart 3 - Total Campuses by Level

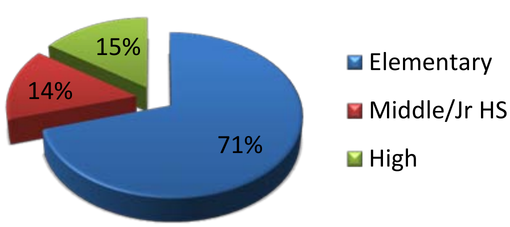
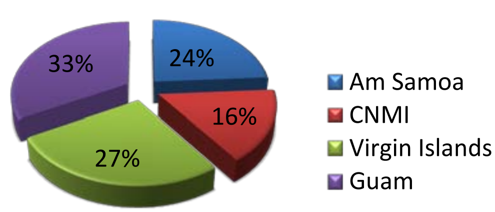


Chart 4 - Total Campuses by Territory



***Campus Buildings*[2]**

Campus buildings include all structures located on a campus other than covered walkways, which are addressed in the "grounds" category. As with campuses, most buildings are used for elementary school purposes, and are located mostly in Guam.

Chart 5 - Total Buildings by Level

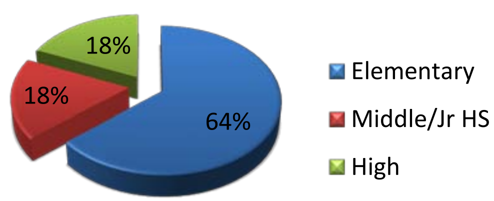
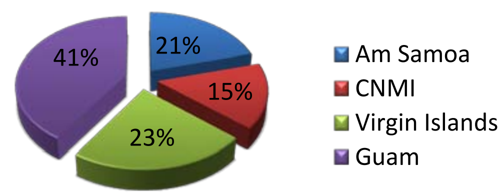


Chart 6 - Total Buildings by Territory



Guam schools make up nearly a third of the total campuses, more than a third of total buildings and over 40% of student enrollment (e.g., more students per campus than in other territories). An inventory and assessment of Guam school facilities is currently underway by GDOE and therefore may not be needed to be included in OIA's Phase 2 initiative. The Phase 2 budget estimate includes Guam public schools facilities (in the event the GDOE study is delayed or otherwise does not satisfy OIA requirements) and can be adjusted if assessment of these facilities is not needed.

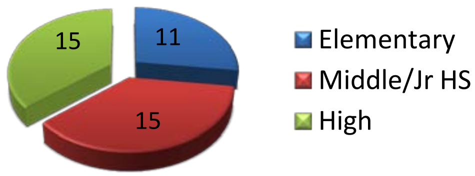
Building Count Averages

To gauge the amount of site inspection effort needed for the Phase 2 facility condition assessment, Phase 1 inventory efforts first attempted to document total floor area to be assessed in addition to total buildings and campuses in the study area. Due to time constraints and data limitations, estimates of total floor area were not available in a consistent, verifiable format so the next best comprehensive data set was "number of buildings." [3] The Phase 2 assessment duration is estimated based on a "ten buildings-per-day" factor. As shown in Chart 5 below, middle and high school campuses are, on average, comprised of 15 buildings and elementary schools, 11 buildings.

[2] Phase 2 assessments will more accurately identify total campus facilities and exclude buildings that do not directly serve educational purposes from facility counts when such cases exist.

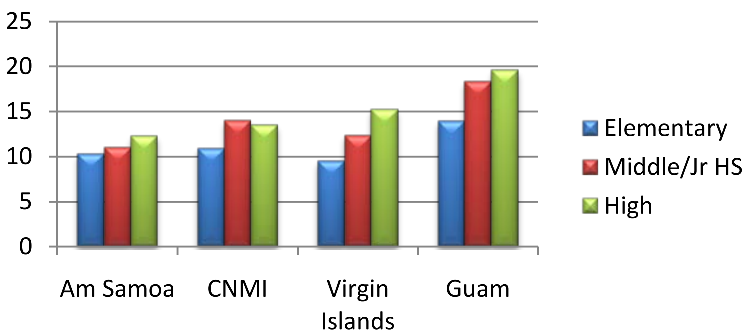
[3] Information received from territorial school districts was incomplete (no information was received from American Samoa DOE; some districts did not include floor areas for all schools, etc.) but given some extrapolation and manipulation, the following rough floor area estimates can be estimated: Guam: 2.5 MSF; CNMI, 1.1 MSF; VI 1.8 MSF; (average of 56.8 KSF/campus). Extrapolating to the 125 campuses in the study area, this would equate to a total floor area of about 7.1 MSF.

Chart 5 - Average Buildings by Level



As indicated previously, Guam comprises the highest number of schools and facilities in the study area, and Chart 6 shows Guam schools also have the highest average number of buildings per campus.

Chart 6 - Average Buildings per Campus



School Identification

Several data sources were used in determining total campus and facility counts including DOE web-based, inventory sheets and campus site plans provided by the Territories, and visual inspection of ArcGIS satellite and aerial imagery, U.S. Civil Defense Critical Infrastructure GIS data (American Samoa), and Google Earth satellite and aerial imagery. The information offered below is believed to be current and complete. More detailed site investigations for each campus were not possible due to Phase 1 time and budget limitations. Phase 2 inspection will include inventory corrections. More detailed school location maps and aerial site photos of each school campus are provided in Appendix C - Campus Locations and Aerial Site Photos.

American Samoa

Table 1 – Schools on Tutuila

Tutuila Schools	Level	Fac #
Afonotele Elementary School	Elementary	7
Alataua II Elementary School	Elementary	12
Alofau Elementary School	Elementary	11
Aua Elementary School	Elementary	13
Aunu‘u Elementary School	Elementary	7
Pago Pago Elementary School	Elementary	23
Lauli‘i Elementary School	Elementary	11
Leatele Elementary School	Elementary	9
Leone Midkiff Elementary	Elementary	16
Lupelele Elementary School	Elementary	18
Manulele Elementary School	Elementary	15
Masefau Elementary	Elementary	4
Matafao Elementary School	Elementary	16
Matatula Elementary School	Elementary	4
Mt. Alava Elementary School	Elementary	7
Olomoana Elementary School	Elementary	8
Pavaiai Elementary School	Elementary	19
Siliaga Elementary School	Elementary	7
Special Education	Elementary	4
Tapu Tapu Elementary School	Elementary	5
Manulele Jr. High	Middle	11
Fagaitua High School	High	8
Leone High School	High	14
Polytech High School	High	7
Samoana High School	High	11
Tafuna High School	High	26

Table 3 – Summary of grade level groups and total facilities:

Level	Campuses	Fac #
Elementary	23	238
Middle	1	11
High	6	74
Totals	30	323

Table 2 – Schools in Manua (Olosega and Tau Islands)

Manua Schools	Level	Fac #
Faleasao Elementary School	Elementary	6
Fitiuta Elementary School	Elementary	5
Olosega Elementary School	Elementary	11
Manu'a High School	High	8

CNMI

Table 4 – Schools on Saipan

Saipan Schools	Level	Fac #
Dan Dan Elementary School	Elementary	11
G.T. Camacho Elementary School	Elementary	9
Garapan Elementary School	Elementary	11
Kagman Elementary School	Elementary	7
Koblerville Elementary School	Elementary	9
Oleai Elementary School	Elementary	8
Reyes Elementary School	Elementary	15
San Antonio Elementary School	Elementary	9
San Vincent Elementary School	Elementary	16
Tanapag Elementary School	Elementary	13
Chacha Oceanview Jr High School	Middle	9
Hopwood Jr High School	Middle	17
Kagman High School	High	14
Marianas High School	High	19
Saipan Southern High School	High	14

Table 5 – Schools on Rota

Rota Schools	Level	Fac #
Sinapalo Elementary School	Elementary	9
Rota Jr. High School	Middle	16
Rota High School	High	7

Table 6 – Schools on Tinian

Tinian Schools	Level	Fac #
Tinian Elementary School	Elementary	14
Tinian Jr/Sr High School	Middle	14

Table 7– Summary of grade level groups and total facilities:

Level	Campuses	Fac #
Elementary	12	131
Middle	4	56
High	4	54
Totals	20	241

Guam

Table 8 – Schools on Guam

Guam Schools	Level	Fac #
Adacao Elementary School	Elementary	6
Astumbo Elementary School	Elementary	12
C.L. Taitano Elementary School	Elementary	14
Capt Price Elementary School	Elementary	18
Carbullido Elementary School	Elementary	14
Chief Brodie Memorial Elementary	Elementary	20
Daniel L Perez Elementary School	Elementary	12
F.Q. Sanchez Elementary School	Elementary	4
Finegayan Elementary School	Elementary	17
Hagatna Heights Elementary School	Elementary	13
Inrajan Elementary School	Elementary	8
J.P. Torres Elementary School	Elementary	8
J.Q. San Miguel Elementary School	Elementary	12
Juan M. Guerrero Elementary School	Elementary	20
L.B. Johnson Elementary School	Elementary	24
Liguan Elementary School	Elementary	6
M.A. Sablan Elementary School	Elementary	22
M.U. Lujan Elementary School	Elementary	21
Machananao Elementary School	Elementary	8
Maria A Ulloa Elementary School	Elementary	22
Merizo Martyrs Memorial Elementary	Elementary	15
Ordot Chalan Pago Elementary	Elementary	10
P.C. Lujan Elementary School	Elementary	11
Talofofo Elementary School	Elementary	14
Tamuning Elementary School	Elementary	6
Truman Elementary School	Elementary	13
Upi Elementary School	Elementary	22
Wettengel Elementary School	Elementary	19
Agueda Johnston Middle School	Middle	18
Astumbo Middle School	Middle	17
F.B. Leon Guerrero Middle School	Middle	23
Inarajan Middle School	Middle	16
Jose Rios Middle School	Middle	15
L.P. Untalan Middle School	Middle	26
Oceanview Middle School	Middle	16
Vicente S.A. Benavente Middle School	Middle	16
George Washington High School	High	23
JFK High School	High	16
Okkodo High School	High	20
Simon Sanchez High School	High	17
Southern High School	High	22

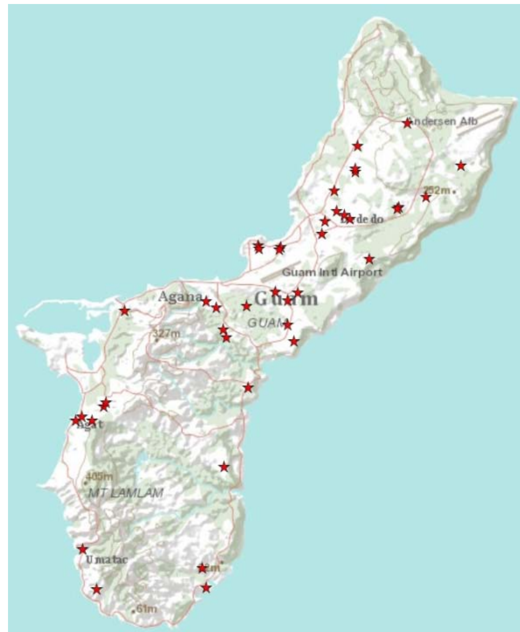


Table 9 – Summary of grade level groups and total facilities:

Level	Campuses	Fac #
Elementary	28	391
Middle	8	147
High	5	98
Totals	41	636

U.S. Virgin Islands

Table 10 – Schools on St. Thomas

St. Thomas Schools	Level	Fac #
E. Benjamin Oliver Elementary	Elementary	17
Edith L. Williams Alternative	Elementary	14
Evelyn E. Marcelli Elementary	Elementary	6
Evelyn Marcelli Annex	Elementary	1
Gladys A. Abraham Elementary	Elementary	7
Jane E. Tuitt Elementary	Elementary	8
Joseph Gomez Elementary	Elementary	12
Joseph Sibilly Elementary	Elementary	9
Leonard Dober Elementary	Elementary	6
Lockhart Elementary	Elementary	14
Monroe Elementary (J. Sibilly Anx)	Elementary	2
Ulla F. Muller Elementary	Elementary	10
Yvonne E. Milliner-Bowsky Elem	Elementary	10
Addelita Cancryn Junior High	Middle	16
Bertha C. Boschulte Middle School	Middle	15
Charlotte Amalie High School	High	26
Ivanna Eudora Kean High School	High	16

Table 11 – Schools on St. John

St. John Schools	Level	Fac #
Guy H. Benjamin Elementary	Elementary	6
Julius E. Sprauve School	Elementary	10

Table 12 – Schools on St. Croix

St. Croix Schools	Level	Fac #
Alexander Henderson Elementary	Elementary	3
Alfredo Andrews Elementary	Elementary	3
Charles Emanuel Elementary	Elementary	8
Claude O. Markoe Elementary	Elementary	13
Eulalie Rivera Elementary	Elementary	15
Evelyn M. Williams Elementary	Elementary	13
Juanita Gardine Elementary	Elementary	28
Lew Muckle Elementary	Elementary	11
Pearl B. Larsen Elementary	Elementary	4
Ricardo Richards Elementary	Elementary	8
Arthur Richards Junior High School	Middle	9
Elena Christian Junior High School	Middle	13
John H. Woodson Junior High	Middle	9
Central High School	High	15
Educational Complex High School	High	4

Table 13 – Summary of grade level groups and total facilities:

Level	Campuses	Fac #
Elementary	25	238
Middle	5	62
High	4	61
Totals	34	361

Natural Hazard Zones

All facility investments should consider life-cycle costs as well as capital costs. Large investments made to hazard prone facilities may be shortsighted. Phase 1 consultations made it clear that that most school facilities are exposed to harsh oceanic conditions (including corrosive salt spray) and are subject to flooding, earthquake, tsunami and hurricane threats and therefore it is wise to consider hazard mapping parameters (e.g., flood zones, soil stability, tsunami inundation zones, and force wind corridors) in facility planning and investment decisions. Water infiltration (through the roofs, walls or seeping in through the floors) is a very common problem experienced in all the territories that can be caused by being located in flood prone areas or in areas with poor soils. Local planners will need to consider the vulnerability or mal positioning of school campuses or buildings as they begin to plan for the recapitalization of the school facilities envisioned in the OIA initiative. School facilities targeted for significant reinvestment, which are also located in documented hazard zones, should receive extra scrutiny in the form of a lifecycle cost assessment to properly evaluate the costs and benefits of relocating or retaining the facilities where they are. Suitable land for public schools is very scarce in all the territories so a relocation decision is an extreme one but nevertheless must be carefully considered.

Requests to local governments and internet research was conducted to locate digital hazard mapping in Phase 1 to begin to explore the effect hazard attributes might have on local school reinvestment decisions. Ultimately, FEMA digital flood insurance rate maps were purchased for the USVI (USVI officials frequently referred to flood prone school sites) to determine the extent to which USVI schools were located in federally designated flood prone areas. Note: it's highly likely that other territories' school facilities are also located in flood prone areas and we recommend that these all be mapped as part of the Phase 2 pre planning effort (see Section 4).

Using GIS mapping technology (see Appendix D), it was determined that the following 8 schools in the U.S. Virgin Islands are located within Flood Hazard Zones:

Table 14 - USVI Schools Located in Flood Hazard Zones

USVI Schools in Flood Hazard Areas	Level	Island	Fac #	Sq Ft	Flood Zone
Gladys A. Abraham Elementary	Elementary	St. Thomas	7	10076	AO (2 ft.)
Ulla F. Muller Elementary	Elementary	St. Thomas	10	11424	AO (2 ft.)
Evelyn Marcelli Annex	Annex	St. Thomas	1	NA	AE (7 ft.)
Addelita Cancryn Junior High School	Middle	St. Thomas	16	46094	AO (2 ft.)
Bertha C. Boschulte Middle School	Middle	St. Thomas	15	102581	A
Edith L. Williams Alternative Academy	Other	St. Thomas	14	NA	A
Pearl B. Larsen Elementary*	Elementary	St. Croix	4	87549	A*
Ricardo Richards Elementary	Elementary	St. Croix	8	38905	A

**Pearl B. Larsen encroaches "Other Flood Areas", Zone A, and abuts a Zone AE floodway near an existing dam.*
Source: FEMA FIRM, Maps 7800000001 through 7800000094

Additionally, 2 schools are located within close proximity to Flood Hazard Zones:

- Guy H. Benjamin Elementary (St. John) – near Zone AE (9 foot base flood elevation)
- Lew Muckle Elementary (St. Croix) – near Zone A (undetermined flood elevation)

The relevance of this flood plain "encroachment" will not be fully appreciated until the Phase 2 facility condition assessment is completed. For example, based on information provided by USVI DOE staff, the Addelita Cancryn Junior High School is located in an industrial waterfront area (e.g., high opportunity cost and land use incompatibility issues), on reportedly poorly filled land, as well as being located in a flood hazard zone (Zone AO – Flood depths of 1-3 feet). Any major new investment in this campus, should Phase 2 indicate it is warranted, should carefully weigh the risks and benefits that the current site affords.

3. Phase 2 Facility Assessment Program

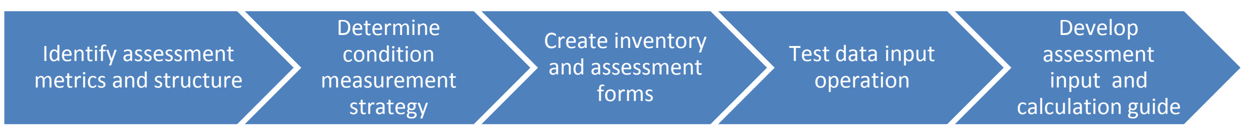
Facility Condition Assessment Program Selection – Study Methodology

Research included literature review, interviews with facility managers, and experimentation with and adaptation of the models identified to create a program that meets the needs of educational facility maintenance managers in the U.S. Territories.

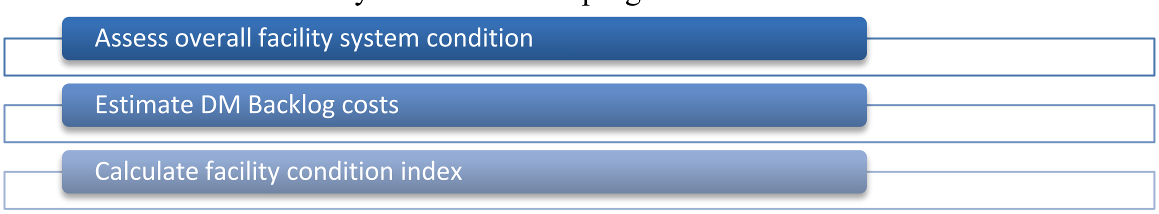
Literature review undertaken identified useful data points for facility system assessment, inventory and monitoring techniques, metrics for data calculation, exemplary assessment models, and shortfalls of different assessment models.

Interviews with school managers and administrators were undertaken to gather information on existing practices, collect available facility inventory data, and to identify ongoing problems or deficits.

Review of existing models for this study included the following steps:



The recommended inventory and assessment program will:



Program Characteristics Summary

Complex and simplistic facility assessment models exist. Complex programs can be difficult to implement because of exhaustive data gathering, confusing data entry and calculation processes, or the inability to appropriately fund and phase projects in a comprehensive manner. Simplistic programs may not utilize resources most efficiently. Pitfalls common to facility assessment programs include the following:

Complex	Simplistic
• Time loss from training and data entry problems • Disconnect between actual need and need reported • Partial funding received because system cannot recognize related projects • Ineffective funding or project timing can cause a loss of system credibility	• Unnecessary time and money spent on detailed inspections • Assumes ready access to funds and materials • Ample time needed to immediately address deficiencies

The potential exists for any program to incur the following problems:

- Utilize a slow and obstructive multi-layered bureaucratic system
- Lead to inefficient or ineffective allocation of funds
- Be affected by subjective/unjustified division of funds or conflicts of interest

The selected program should be able to:

- Sufficiently address educational programming needs
- Effectively catalog facility conditions
- Accurately catalog backlog data
- Utilize an understandable data entry system
- Provide a holistic view of the campus and effectively coordinate projects
- Maintain a transparent and meaningful connection between facility needs, project prioritization and funding delivered
- Adapt to pressing needs

Alternatives

Literature review for this study was undertaken to identify two overarching program features:

1. Methods of approach to facility condition assessment
2. Features of example facility assessment programs

Facility condition assessments estimate the amount work needed to bring a facility to an acceptable condition. Measurements target either a relative ranking, the gross monetary value of work required for a facility to meet acceptability standards, or the total work needed excluding regular maintenance, programmed repairs, and capital improvements. The latter is defined as deferred maintenance which results from budget inadequacy or an ineffective maintenance program. Calculating deferred maintenance gives a more accurate record of additional funding needed and can focus additional or redirected funds on specific facility systems or priorities.

Facility "systems" refer to the functional components of a facility such as the foundation, roof, walls, and utilities. Elements or features of these systems are visually inspected to determine the overall condition of the system. System deficiencies can be grouped into different priority levels to help direct investment efforts.

This study reviewed the following 7 example programs: 1) Bureau of Indian Affairs Facility Management Information System, 2) NASA Parametric Cost Estimating for Deferred

Maintenance, 3) State of Montana Facility Condition Assessment program, 4) Arkansas Statewide Educational Facilities Assessment, 5) State of Colorado School Facility Assessment, 6) Idaho Statewide School Facilities Needs Assessment Update, and 7) Howard County Public School System Facility Assessments. A summary of findings for these models is provided in Appendix B – Facility Assessment Program Investigation.

These models were reviewed to determine the best way to divide campus facilities into systems and to determine what considerations are needed for assessing the respective systems. Additionally, the assessment method for these models was analyzed to determine critical components and overall effectiveness and model efficiency. The ability to replicate the model was a key consideration.

Key program features evaluated in this review include:

- Assessment categories
- Condition rating method
- Reporting method
- Party responsible for condition assessment and level of training required
- Program operation costs

Phase 2 facility assessment efforts will include participation by Territorial stakeholders and in close coordination with local leadership. Most of the programs reviewed for this study are overseen by private contractors and are based on proprietary systems. Two programs reviewed are overseen by public agencies and implemented by school facility maintenance staff, the Bureau of Indian Affairs (BIA) Facility Management Information System (FMIS) and the National Aeronautics and Space Administration's (NASA) standardized Deferred Maintenance rapid visual assessment and parametric estimating model (DM).

Extensive review of FMIS uncovered high error rates for data reporting and high costs in subsequent corrective efforts. The complexity created by immediately costing and prioritizing needed projects during condition assessment or during data entry causes confusion for the facility maintenance staff and disconnect between needs, project approval and funding.

The NASA DM method is considered a low cost model for assessing the overall condition of facilities across a large sample and estimating the costs of facility deficiency remediation. When tracked over time, the data gathered in this program can be used to show the effectiveness of maintenance program improvement efforts.

From the review of alternatives, this model offers the most efficient and adaptable program for OIA purposes and is detailed as the selected method in Appendix A. Metrics and calculation factors are identified and openly available so proprietarily programs and software are not required. As shown in Table 14, NASA facility system categories[4] aptly capture facility elements.

[4] The NASA categories coincide with industry standards including the American Society for Testing of Materials (ASTM) UNIFORMAT II Classification for Building Elements.

Table 14 - Program Systems Comparison

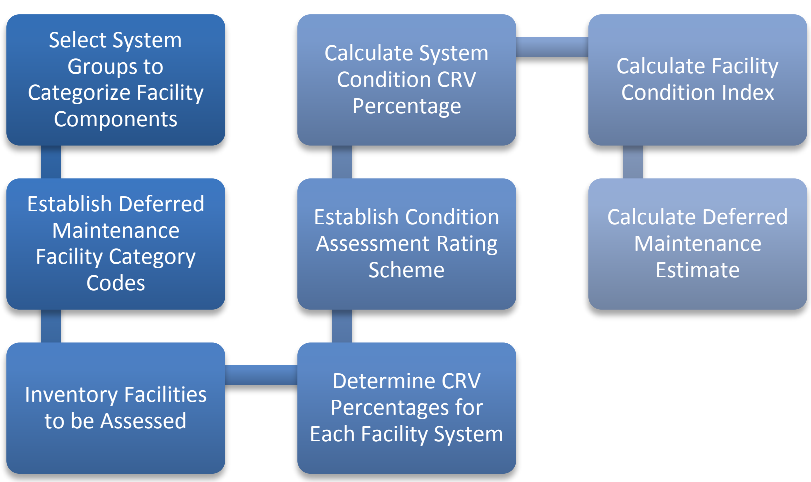
BIA	NASA	Montana	Arkansas	Colorado	Idaho	Howard County
Emergency	Structure	Foundation	Site	Structure	Exterior	Site
Safety	Exterior	Envelope	Roofing	Mechanical	Interior	Structure
Physical plant	Roofing	Floor System	Exterior	Fire/Safety	Mechanical	Exterior
ADA	HVAC	Roofing	Structure	ADA	Safety/code	Roofing
Environmental	Electrical	Finishes	Interior			Mechanical
Predictive renewals	Plumbing	Specialties	HVAC			Electrical
New construction	Conveyance	HVAC	Plumbing			Plumbing
Planned Imprvmnts	Interior	Plumbing	Electrical			Conveyance
Energy	Equipment	Electrical	Technology			Fire/Safety
		Conveyance	Fire/Safety			Interiors
		Safety	Specialties			

Fire/safety and Site are not nominally identified in NASA's systems list (condition assessment of fire protection sensors, alarms and extinguishers is addressed in electrical and plumbing system categories). The Safety category includes structural deficiencies, egress and design features, as well as site considerations. These items are adequately addressed by the categories defined in the selected method and Site Assessment considerations discussed below. Site condition is important to facility assessment, but does not correspond with deferred maintenance estimation for structural facility systems. Site assessment is considered separately and is addressed below. Conveyance is not likely needed, and the exclusion of this system is discussed in Appendix A.

Deferred Maintenance Backlog Estimation

This Phase 1 study aims to create a system that helps facility managers to inventory and assess campus facilities and estimate remediation costs – and deferred maintenance backlog estimation is best suited to meet this objective.

Under the selected model, condition assessments are undertaken at the building system level (structure, exterior, roofing, etc.). Unique values are used to calculate DM estimates for different types of facilities as established in the NASA Deferred Maintenance Parametric Estimating Guide. The major steps required in estimating deferred maintenance are outlined below:



Facility Condition Standards

Consistent facility maintenance standards should be used throughout the study area as the basis for the facility condition assessment rating system to determine minimum acceptable and desired conditions.

In addition to assessing individual building systems on each campus, the proposed assessment model will evaluate overall grounds condition at a gross level (i.e., add a "grounds" component to the NASA building system check list).

The establishment of clear, unambiguous standards is necessary to ensure consistent inspection results and reduce variations caused by inspector perspective.

Development of facility condition standards should consider relevant legal requirements, regulations, industry standards, and the support of educational services.

Initial condition assessment will be limited to a rapid visual assessment and should be undertaken or supervised by qualified professionals. Examples of visual assessment attributes are offered in Table 15 below. More detailed assessment criteria are given in Appendix A.2 – NASA Condition Rating Criteria for Buildings.

Table 15 - System Deficiency Attributes for Visual Assessments

Structure • *Failed foundations and structures.* • *Spalled or scaling concrete.* • *Cracked or rotten support columns or beams*	**Roof** • *Leaking roofs.* • *Damaged roofing materials (cracked, peeling, rotting)* • *Inadequately secured gutters* • *Damaged flashing*
Exterior finishes • *Peeling or flaking paint.* • *Rust stains or corrosion.* • *Stained or mildewed concrete surfaces.* • *Broken or cracked windows.* • *Cracked or rotten materials*	**Interior finishes** • *Stained or broken ceiling tile.* • *Worn or broken floor tile.* • *Painted surfaces worn through to base materials.* • *Carpet wear-paths or ripples.* • *Cracked or rotten materials*
Mechanical • *Outdated building automation, fire, security, and safety systems configurations.* • *Equipment and systems operating well past life cycle.* • *Leaking steam traps.* • *Electrical or mechanical equipment not meeting current codes.* • *Leaking and nonoperational components.* • *Abandoned-in-place conduit*	**Electrical** • *Permanent electrical extension cords.* • *Inadequate/ excessive lighting* • *Abandoned-in-place conduit, wiring, cables, or piping.* • *Unsecured or failed pipe insulation.* • *Overheated motors or electrical devices.* • *Unmetered utilities.*

Plumbing • *Leaking pump seals.* • *Unmetered utilities.* • *Unsecured or failed pipe insulation.* • *Abandoned-in-place conduit, etc.* **Program-support equipment** • *Energy-inefficient equipment and systems.*	**Grounds** • *Failed asphalt or concrete paving.* • *Debris on grounds or in mechanical areas.* • *Tripping hazards.* • *Traffic signs and markings not meeting the Manual on Uniform Traffic Control Devices.* • *Inadequate brush clearance around buildings in fire hazard areas.* • *Drainage and fenceline problems*

Source: Adapted from: NASA Procedural Requirements (2008), pp. 133-134.

The Phase 2 baseline survey will also need to round out the rudimentary facilities inventory established in Phase 1 including classification of each building by use to determine building component proportions and overall replacement value. Building type (wood frame, concrete, concrete and steel, etc.), is not essential for replacement value estimation because costs for selected design standards will be used in estimating actual costs of replacement. Documenting building materials could help in monitoring buildings that are likely subject to rapid degradation due to termites, rust or other considerations.

Site Considerations Requiring Higher Level Review

Assessment items requiring higher level review includes the following:

- Schools affected by natural hazards like tsunami inundation zones, flood zones, unstable soils, etc.
- Functional Obsolescence (40-year old classrooms may no longer meet modern classroom requirements –decisions to repair, upgrade, replace/relocate will need to be made at a high level based on lifecycle cost analysis).
- Land use compatibility issues (e.g., changing land use patterns that adversely effect the learning environment)

The attributes summarized above are recognized as beyond the scope of Phase 2 but are key considerations nonetheless. Essentially they revolve around the decision to repair, upgrade, replace/relocate a building or an entire school based on some type of chronic condition (other than building condition). The DM backlog cost estimates will be based on modern equivalent building types so in a way, some cushion or upgrade is built into the way the DM backlog is calculated.

The issue becomes particularly acute when DM backlog costs approach current replacement cost a given facility. Then an important policy decision needs to be made trading off short term benefits (getting the facility back in service again in the shortest possible time) with long term costs (the inevitability of more flooding, problems of adapting current teaching methods into an obsolete shell, excessive noise from a nearby highway, etc.). This issue is typically dealt with at a policy level in the CIP planning process to minimize the inevitable hand wringing, agonizing decisions of considering facility closure, consolidation or relocation.

4. Phase 2 Approach and Budget

General

The Phase 2 project is divided into two sub phases: Phase 2A which consists of the initial school condition rating/DM estimate and Phase 2B which covers the periodic re-inspection needed to discern trends in school condition and DM backlog.

One of the major policy variables needed to fine tune the overall approach is the extent to which local involvement is desired in the OIA initiative. Of the various tasks described below, the on-site school inspection task (Task No. 3) is the most opportune for local participation (estimated at about 60% of total project hours). Considerations include:

- A strong local presence in the school inspection process would build local capacity (sorely needed) and perhaps increase the sense of territorial ownership and investment in the initiative. Since the process is conceived as occurring over a number of years with the long term goal of fostering sustainable, self dependence, local capacity building could be seen as a critical by-product of the OIA initiative. Leveraging the inspection team with properly supervised local personnel could also increase the inspection rate, reducing the overall duration of the task.
- On the other hand, a focused, centralized inspection team would be able to move more rapidly and develop more uniform, inter-territorial results. Based on previous experience, a centralized team would be more focused and driven than a locally recruited team that may be distracted by other business matters that a traveling team would not. Developing, training documentation and managing locally based teams in each of the territories represent a cost item that would be avoided with a centralized core team.
- Intuitively, it appears like there may be little cost differential between the two approaches. The centralized team would incur travel and per diem expenses that would be reduced with local team substitutes (with the cost savings repurposed to support local recruits). Labor rates for centralized team members are assumed to be greater than for lesser skill levels in the territories so each SME field day reduction (e.g., transitioning from inspector to inspector supervisor) could equate to two days of local staff time. A locally-based team would still require training and oversight from the centrally based SME team.

Our preliminary recommendation is to have a strong centralized role for SME's (architects, engineers, specialists) that develop the standards and inspection protocols and then train and supervise a team of locally recruited building inspectors.

Phase 2 Team Composition

The Phase 2 Team would be led by a Prime Consultant and supported by a range of SMEs including Architects, Engineers (Structural, Electrical, Mechanical, Plumbing, Civil), Cost

Estimator and IT specialists. The Prime Consultant would participate in all aspects of the assignment and serve as the primary point of contact with the client and the stakeholder community. The SME team members would develop the protocols, standards and requisite information technology; conduct and/or supervise the school inspections, and assist the Prime Consultant in delivering the data and information needed by the Secretary to determine the condition of the insular schools.

Phase 2A Task Description

The major tasks associated with Phase 2A (initial baseline survey) are described below. Tasks associated with Phase 2B (reinspection) are described in a following section.

Task	Description
1. Work Plan	Identifies purpose and need for the study and general outcomes and work products. Identifies key personnel assignments and organizational relationships, detailed task descriptions and milestones and schedule for their accomplishment. Approval for the work plan must be obtained prior to its implementation. Progress in executing the work plan will be reported monthly via a status report
2. Pre-Planning	The pre-planning task is critical to the success of Phase 2 and involves a number of high level assignments and concludes with the submission of a Pre-Planning Report and major client briefing. 2.1 Replacement Cost Model Specification. The NASA DM model relies on a typology of building types ("category codes") that can be correlated with standard costs estimating factors. The typology of school building types needs to be created and cost factors developed during this stage. Typical building types would include classroom, library, cafeteria, office, etc. Although the NASA DM model relies on RS Means CostWorks database, (or equivalent) it's likely that some additional location specific adjustment factors will need to be developed to fully reflect some of the remote locations involved. 2.2 Information Management System (IMS). The overall IMS would be developed during this task including standing up the project web site, developing the facility condition index algorithm and designing the overall facilities management information system (FMIS). Also included in this phase would be developing the various access rules and privileges and functionality of the reporting tools (e.g., executive dashboard for senior managers) and remote data access/data entry tools for field survey use. 2.3 School Survey Methodology/Procedures. Following general industry standards, a school facility survey methodology would be developed setting forth the detailed method by which each school will be evaluated. To the extent possible, this would be "checklist" oriented to standardize data input although the field inspection team will also be asked to comment on qualitative aspects of overall condition as well (within a pre-determined structure). The robustness of this task is paramount to ensure uniform results through the territories and over

	time. The general procedure to inspect each school will be detailed – including pre- and post inspection procedures. Inspection procedures for each of the building systems (structural, roofing, exterior, etc.) will be documented to the extent practical.[5] 2.4 Prototyping. A critical component of this task will be to conduct a prototype school facility assessment. Ideally, the school would be within in one of the subject territories but that may not be logistically practical. A local public school would be an adequate substitute to trouble shoot and refine the facility condition index algorithm. 2.5 Site survey logistics. A master schedule of school surveys would be created based on an initial round of communications with territorial staff. This initial round of communications may also include additional information requests and specific requests for on the ground support during the school facility assessments. During this period, each territory will determine how much support or involvement it seeks to have in the actual school survey. Some DOE's have indicated they would like to have their facilities maintenance staff participate in the school surveys and these types of engagements would need to be documented during this stage in a way that doesn't substantially degrade the flexibility the survey team will need to maintain. 2.6 Online School Principal Questionnaire. School Principals play a critical role in maintaining school facilities, and need to be constructively and efficiently engaged in the survey process. A questionnaire would be developed and fielded to school principals at least several weeks in advance of the survey team arrival. The questionnaire would include some basic read ahead information about the survey as well as a series of questions about facility condition to establish an *a priori* starting point for the inspection team. The questionnaire would need to be user friendly and respectful of the principal's time to achieve a meaningful response rate. 2.7 Standup of a project website to facilitate communication/collaboration between the project team, the client and territorial stakeholders (three levels of access). 2.8 Various work products associated with this task would be summarized in a Pre-Planning Report and presented at a client workshop for feedback. Approval of the Pre-planning Report must be obtained prior to its implementation.
3. School Inspections	On-the-ground inspections of the 125 territorial schools at an approximate rate of one school every two working days. Monthly progress reports would be issued to document progress (see work plan).

[5] The guidance documents will be prepared by subject matter experts (SME). To the extent practicable, the guidance will be designed so that it could be used by a trained building inspector – not necessarily an SME. Under this scenario, the SME would still need to be involved in a supervisory capacity – in initial training and also conducting quality control inspections.

	Basic procedure for each territory would be as follows. Site visit logistics. Initial coordination with DOE/PSS staff would occur during the pre-planning phase that would establish the general range of field inspection dates and the general sequence of school inspections (at a rate of 2-3 schools per week). Inspections for each territory are assumed to take between 2 to 4 calendar months, depending on the number of schools. Approximately one week prior to the school survey team arriving in the territory, the team's onsite coordinator would arrive to update DOE stakeholders on the inspection schedule, coordinate with local survey staff (if appropriate) and finalize logistics for the survey crew. The two day/school "module" would generally be allocated by the inspection team as follows. The first two hours of the day would be allocated to preparing for the inspection, reviewing available information, reviewing the principal's questionnaire responses, ensuring that the hand held data collection devises are properly functioning, etc. About mid morning, the inspection team would report to the principals' office and introduce themselves to the principal and receive any last minute instructions, etc. The team would then commence the facility survey. At the end of the second day, a team representative would provide an exit briefing to the school principal and the team would finalize its data input records for the school and verify that the information was complete and accurate. This general pattern would be replicated across all of the schools in the study area. The inspection team will be equipped with handheld wireless devices (tablet PCs or laptops) linked to the centralized facilities database. Current information for each school (tabular and graphic) would be downloaded from the main database to the handheld tool and populated/updated/edited in the field by inspectors as the condition assessments were conducted. After reviewing and checking the entries at the conclusion of the site visit, the inspectors would upload the data back into main database. As noted, Phase 2 inspection will also include additional facilities data collection to flesh out the rudimentary database needed to compute building condition scores. This includes defining the individual building perimeter and number of floors, basic construction type and use (from a predefined checklist). Inspectors will also log and report any urgent life/safety issues they encounter. The definitions of what constitutes "urgent life/safety" and the reporting procedure will need to be predetermined. The inspection team cannot be burdened with detailed code compliance issues and their rapid inspections will not substitute for a detailed code inspection. If the inspectors encounter bare electrical wires or an uncovered manhole, for example, they will report it. It is inevitable that changes in the inspection schedule will occur for many reasons including adverse weather, encountering more complex facility condition issues, etc. There will also be times when survey team members will have to return to a school already visited to confirm something or otherwise follow up. A good working relationship with the local DOE staff and the school principals will go a

	long way to easing the burden that schedule changes can precipitate. The school inspections will be arduous and some time-off has been built into the overall schedule. The inspections are assumed to occur during a six day work week with every fifth week off. This assumption can be relaxed with the substitution of local inspectors for SME's (e.g., towards a more traditional 9-5 M-F schedule).
4. Draft Report	The draft report would be issued after completion of the school inspections. A summary report documenting the school facility inspection process would be produced including findings (e.g., Deferred Maintenance budgets and rankings of the subject school facilities), issues raised and discussion of improvements and methodological refinements. The draft report would include the complete school facility database (electronic media or actual web link to database) with instructions on how to access the data and develop data reports (e.g., school by school, territory by territory, building system by school or territory, etc.) The draft report would be presented at a client workshop. Feedback received at the workshop and in the subsequent draft review phase would be incorporated in the final report.
5. Final Report	The final report would incorporate recommendations in the draft report and would consist of several standalone components: • A highly polished executive summary documenting the overall process and highlights of the Phase 2A investigation. Key sections will include rating system descriptions, summary level tabular representations of facility condition scores and DM dollar value by various pertinent cross tabulations, and recommendations for refinement and improvement. • A Database Report summarizing database architecture and, providing detailed facility condition score/DM dollar value by a variety of cross tabulations • Technical Working Papers Book including copies of major project correspondence, presentations,. • A database users manual (for database managers and users). • The database master files (unless a separate database management arrangement is negotiated).

Phase 2B Task Description

Tasks associated with Phase 2B (reinspection) are described below. Phase 2B inspections should take a fraction of the effort the Phase 2A inspections took because the assessor is really only trying to evaluate marginal changes (improvements or decrements) to the facility condition score. Alternatively, the reinspection process could be expanded to include collection of additional data sets or more detailed data that might be helpful to fulfilling the Secretary's goal of improving school facility condition (assumption herein is that not change to inspection SOP is indicated).

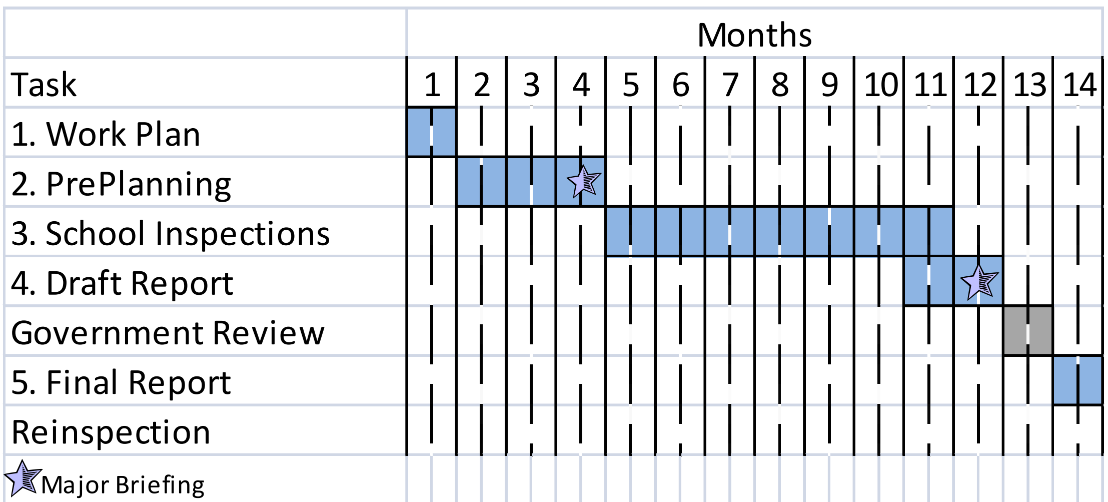
Task	**Description**
1. Work Plan	The work plan would follow the same general outline as the Phase 2A work plan but the focus would be on the approach to reinspect the school facilities. The reinspection periodicity would first need to be confirmed by OIA (e.g., reinspecting 100% of the inventory every 3, 4 or 5 years equates to surveying 33%, 25% or 20% of the facilities each year, respectively – or between 25 to 42 schools/year). The reinspection rate, at least theoretically, would relate directly to the expected rate of rate of change of school facilities. If school facility change is likely to be fast, then a 3-year interval is recommended. If the pace is likely to be slower, a 5-year interval might be more effective. There may also need to be a built in hiatus between the completion of the Phase 2A baseline survey and the first reinspection to allow for the hoped for institutional change to occur. A hiatus of two to three years may be appropriate to reflect this interval.
2. Pre Planning	A general review of assumptions and specifications used in the baseline assessment is warranted to ensure completeness. The major subtasks will be site survey logistics where advanced communication with local DOE staff is undertaken. A key component of the reinspection will involve local DOE staff reporting on the range of R&M and CIP improvements/demolitions undertaken at each school since the baseline survey. Standards for the documentation would be developed beforehand but are assumed to include a database entry form, certified by the local DOE, along with scanned copies of construction agreements, as built drawings, photographs, etc. In the event no work has occurred on a particularly school during the hiatus, an aging factor could be applied to the baseline facility condition score to represent general condition degradation. The primary objective in this phase is to provide the SME with a detailed checklist well in advance of scheduling the school reinspections (there is little value to reinspect a school – or a building, that has had nothing done to it since the last inspection. This is why timely information from the local DOE is needed to determine which buildings will be reinspected). The Online School Principal Questionnaire used in Phase 2A would be revised to

	focus on information that the principal feels would be relevant for the reinspection. Team SME's would evaluate information received from the local DOE's and school principals to determine what adjustments in facility condition scores should be made, assuming the changes are verified during the school reinspection and what schools will be reinspected. Inadequately documented changes would be returned to the sender to address or be resolved onsite during the reinspection.
3. School Reinspections	School inspections would occur far more rapidly in the annual reinspection phase because the focus would be to confirm improvements with information received during pre planning, and evaluate any serious adverse change that may have occurred and adjust scores/DM estimates accordingly. Some quality control by SME's is warranted in the reinspection process. It is also assumed that the inspections could be conducted by a two person team (one person for architectural building elements and one person for mechanical/electrical elements).
4. Summary Report/Database Update	A summary report would accompany the formal database update, summarizing major trends in facility condition, discussion of probable factors underlying the trends and any other relevant information.

Preliminary Phase 2 Timeline

As indicated below, Phase 2A would take an estimated 14 months to complete assuming school inspections for CNMI/Guam and American Samoa/US Virgin Islands are conducted in parallel (with AS/USVI following CNMI/Guam inspections). Further schedule compression would be available by further overlapping the school inspections.

Phase 2A Timeline



The Reinspection task ("Phase 2B") would presumably commence 2-3 years after the baseline survey to allow time for institutional change to occur (i.e., warranting a reinspection). Depending on the number of schools to be reinspected annually (25 to 42 schools/year), the annual reinspection should be achievable within a three month period (NTP to database update).

Phase 2A Budget

The Phase 2A budget was developed assuming the SME's physically conduct the school facility assessments although for practical reasons, it's assumed that qualified on-site personnel will be trained to conduct the surveys under SME supervision (overall cost is assumed to be the same). Effort for the various disciplines was first estimated based on full time equivalency (FTE) for each task. E.g., the prime consultant was allocated an FTE of 1 for Tasks 1 and 2, dropping to 0.5 for Task 3. The architect was allocated FTE's of 0.25, 0.75 and 2.0 for the same tasks, respectively. The FTE calculation was then applied to blended labor rates for each discipline and also used to calculate per diem and travel related costs. Summary budget information is provided below.

Phase 2A Budget Estimate

Task	Total
1. Work Plan	$77,000
2. PrePlanning	$393,000
3. School Inspections	$1,413,000
4. Draft Report	$126,000
5. Final Report	$68,000
Subtotal	$2,077,000
Other Direct Costs	$422,000
(per diem, travel)	
Total Budget	$2,499,000

The total $2.499 M budget for Phase 2A (baseline assessment) equates to approximately $19,991/school or approximately $0.35/square foot (acknowledging the square foot estimate has not been validated at this point).

Deleting the Guam school survey work ("Facility Capital Action Plan" or "FCAP") from Task 3 (under the assumption GDOE is able to deliver the FCAP data for its 41 schools in appropriate data format) would reduce the overall project cost by $534,000 ($447,000 labor, $87,000 ODC) to $1.965 M. It is not prudent to assume the full savings are achievable for the following reasons: GDOE did not include its four new schools in the FCAP study and there has been no information provided by GDOE regarding the contractor's methodology and data outputs. At a minimum, the four new schools would need to be surveyed and the data from the GDOE consultant would have to be normalized to "fit" with the data developed in the other territories. The GDOE's FCAP study is scheduled for completion by the end of this calendar year (31 December 2010).[6] Because of the uncertainty involved, it is recommended that the GDOE work product be reviewed by the Phase 2 consultant to determine how much of it can be repurposed for the Phase 2A effort.

[6] GDOE receiveved the FCAP in January 2011, after the pre-final report was prepared.

Phase 2B Budget/Year (33% or 42 schools/year)

The Phase 2B budget was prepared following the same effort projection approach used for Phase 2A. The most aggressive reinspection rate was chosen to establish an upper budget limit. From a scheduling perspective, the reinspections might start in the third year after the baseline survey and then proceed each following year as long as the program is in place. A cost of living/inflation factor was not applied to the budget projection given the uncertainties involved. Over time, inspection costs are expected to rise.

As noted in the description of tasks, a heavy reliance is placed on the local DOE representatives to document campus improvements or new problems that occur post baseline inspection This data would be compiled in Task 2 and would allow for very focused site visits.

Phase 2B Budget Estimate/Year
(33% or 42 schools/year)

Task	Total
1. Work Plan	$26,000
2. PrePlanning	$77,000
3. School Inspections	$83,000
4. Draft Report	$53,000
5. Final Report	$21,000
Subtotal	$260,000
Other Direct Costs	$63,000
(per diem, travel)	
Total Budget	$323,000

The annual $323,000 budget for Phase 2B (33% or 42 schools/year) equates to approximately $7,685/school or approximately $0.14/square foot – about 40% of the /school and /square foot costs associated with the baseline inspection reflecting the significant reduction in /school time associated with the reinspection.

5. Collateral Issues

Section 2 raised a number of structural issues, beyond the scope of the Phase 2 facility condition assessment, that need to be addressed in some fashion in the coming years to ensure that school funding is invested wisely. These issues are all inherently local but have common threads and significant economy of scale potential.

Need to establish and maintain a comprehensive and functional school facilities inventory

The Phase 2 effort will include creating applications and modules to capture, track and report a basic level of information to provide the capability for reporting high-level R&M budget estimates and resource requirements and to provide the foundation for an ongoing facility condition assessment program. The "core" system would be developed to support senior OIA managers' needs to report on funding and resource requirements, OIA's condition assessors needs to efficiently capture and update inventory and condition information and the ability to expand to provide additional capabilities as the condition assessment program develops.

A second phase could be undertaken to address the needs of local school district managers, that would expand the granularity of the data captured/tracked to the system and component level to provide more detailed information of the existing facilities and their systems. It could also introduce three new modules (Cost Model, Location/GIS Mapping and Project Planning) into the core system, which would be focused on the individual facility managers and/or local government users. This follow-on phase could also evaluate any local existing systems that may already be in place (Financial/Accounting, Work Order Management) for the potential of integrating them into the proposed IMS to increase the efficiency of reporting and overall usefulness of the system. Significant cost savings / efficiency would result from deploying a similar system over several jurisdictions (i.e., once developed, it could be made available and used by any other agency/locality that OIA would want to have access to it.)

Need to maintain current long range school facility CIP plans

Centralized guidance and technical assistance in developing the plans would bootstrap this critical effort. The content requirements and general approach to prepare the plans should be standardized to ensure the plans are comprehensive, address the right issues and become an effective political tool in ensuring local support and investment in school facilities. At a minimum the plans need to address the overall vision for the school system, programmatic objectives, system-wide recommendations regarding organization and public involvement, and, critically, a multi-year, prioritized plan for school facilities. The plans could be expanded to include idealized campus layouts, design guidelines and outline material specifications for insular environments, plans for each individual campus, etc. or these could be addressed as separate work products.

Need to standardize school facilities and develop a shared vision for "the classroom of the future"

Again, centralized guidance and technical assistance in developing the standards, specification and plans would bootstrap this critical effort.

Need to standardize the Facilities Maintenance function and ensure that it is adequately funded

Again, centralized guidance and technical assistance in establishing industry-standard school maintenance programs is essential to maximize service lives of school facilities, thereby minimizing overall life cycle cost). The need becomes acute in light of OIA's vision of a substantial reinvestment in school facilities. The local school facility inspection teams proposed to be trained by the Phase 2 SME's could provide a nucleus for an expanded facilities maintenance staff focusing on preventative maintenance

The integration of these collateral issues with OIA's initiative will be important for long term, systemic results and more importantly, will pay for themselves out of long term savings in O&M costs. Should the OIA initiative result in a focused school recapitalization (either through additional federal funds or allocation of an increased percentage of existing federal funds – or both), it is absolutely essential that the investments be made as part of a comprehensive, local CIP plan and not allocated on a piecemeal or per school basis. A high level emphasis on sustainable design treatments/high performance buildings and standardization of building types and systems will reduce long term O&M costs. A comprehensive set of planning and programming standards and minimum material specifications for ES, MS and HS facilities currently lacking (e.g., basic facility requirements for ES, MS and HS facilities, dimensions and types of recreational spaces, student and teacher support spaces, building support areas, classroom and admin spaces, HVAC standards, etc.) will also reduce overall procurement costs and long term O&M costs.

Expectation Management/Communication

As noted, there is a great interest and need to understand what happens when the school condition information becomes available (e.g. the "what next?" questions raised in Section 2). To address this, and to minimize the chance the program will be derailed by rumors and innuendo, OIA will need to develop and implement a comprehensive communications strategy, as part of its Phase 2 initiative, to provide appropriate information at various levels of the community to unify and strengthen support.

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US Army Corps of Engineers

Honolulu District

February 2012

Civil Works Program

Civil Works Program Purpose
The purpose of the USACE Civil Works program is to assist local government agencies with economic development and ecosystem protection and restoration. The Honolulu District vision is to "Enable our Partners".

Mission Areas
• Primary areas include Navigation, Flood Risk Management, and Ecosystem Restoration.
• Secondary areas include Recreation, Hydropower, and Water Supply.

Large Project Development
Project of unlimited scope and cost require congressional line item funding.

Small Project Development
Projects of limited scope and cost are funded and developed programmatically at USACE's discretion.

Technical Studies
USACE may assist in evaluating any water resources problem. Preparation of plans and specifications or construction is not permitted under the technical studies.


Kahului Harbor, Maui

Methodology
All USACE projects must be developed in a watershed context, that is, fully understanding the interconnectedness of problems and ensuring coordination of all recommended actions. This requires greater collaboration amongst not only the proponent agency, but also with other agencies undertaking actions within the watershed and with resource agencies and the communities.

Cost Sharing
The Water Resources Development Act of 1986 requires that a project/study local sponsor share in the cost of project/study development. Cost sharing proportions differ depending on the project purpose.

Implementation Schedule
It is best to think of USACE assistance as the long-term solution. Congressionally prescribed development and review processes intended to thoroughly evaluate Federal interest in the project can be somewhat long. This includes full disclosure of environmental impacts as required by the National Environmental Policy Act.


Hana Harbor, Maui

Broad Authorities Specific for Hawaii and Territories
• Section 209 of the Flood Control Act of 1962 allows USACE to survey the development of almost any water resources problem.
• Section 444 of the Water Resources Development Act of 1986 allows USACE to survey the development of almost any water resources problem.

Challenges
The small population base in the remote Pacific islands and the high cost of construction make it difficult for projects to meet prescribed economic criteria.


Wailupe Stream, Oahu

For information, please contact: Derek Chow (808)438-7009.

Honolulu District

Interagency & International Services Program

U.S. ARMY CORPS OF ENGINEERS

BUILDING STRONG®

February 2012

The USACE through its Interagency & International Services (IIS) Program provides reimbursable, technical assistance to Non-DoD Federal, state, and local government agencies, Tribal nations, private industry, and foreign governments.
The Honolulu District vision is to "Enable our Partners" through the IIS Program to help them meet their program challenges by accessing the USACE expertise, technologies, and other unique support capabilities present within the District, USACE laboratories, and technical centers of expertise.

Product Lines & Services

Planning

- Alternative/Economic Analysis.
- Master Planning.
- Water Resource Planning
- Hydrology & Hydraulic Studies
- Shoreline Inventories
- GIS Services

Design & Construction

- Harbors and Port Facilities.
- Dredging
- Shoreline Protection.
- Highways/Pavements.
- Housing.
- Medical Facilities
- School Facilities
- Emergency Operation Facilities
- Bridges
- Government/Military Facilities (new & rehab)
- Waste Treatment Plant
- Forensic investigation/studies
- Construction Supervision & Administration
- Program/Project Management
- Other facilities

Environmental

- NEPA Compliance
- Environmental Impact Assessments
- Ecosystem Restoration.
- Environmental Monitoring
- Investigation/Analysis Design
- Hazard Toxic Waste
- Cultural investigations/studies
- Ordnance and explosive

Other

- Real Estate: Acquisition, Disposal, Appraisals, and Leasing
- Procurement and contracting: Architect Engineering Services, Construction, and Design-Build
- Quality Assurance Services


Talofofo Shore Protection , Guam


Palau Compact Road


Saipan Emergency Operation Center

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