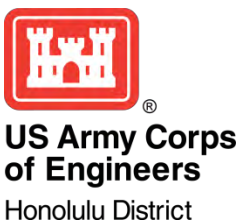


# Insular ABC's Phase III Task 1 **YEAR 1 SUMMARY REPORT**

January 2016



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## Acronyms

CIP	Capital Improvement Project
CNMI	Commonwealth of Northern Mariana Islands
CS	Construction Specialist
DM	Deferred Maintenance
DMRP	Deferred Maintenance Reduction Program
EAMS	Enterprise asset management system
EC	EAMS Coordinator
ECM	Energy Conservation Measures
ETP	Education and Training Plan
H/S	Health and Safety
IEQ	Indoor Environmental Quality
MOU	Memorandum of Understanding
PM	Program Managers
SME	Subject Matter Experts

## Preface

This report summarizes the accomplishments of the first year of the third and final phase of the ABCs Initiative and highlights the planned objectives of the second year. This summary is drawn from a large body of work conducted in preparation of the Phase III deferred maintenance reduction program implementation plan and education and training initiatives.

Phase III Year 1 reports, available in the CD at the back of the hard copy version of this report or available for download at <http://hhfplanners.com/>, include:

1. Memoranda of Understanding (not available online)
2. Operating Agreements (not available online)
3. Territory Work Plans (not available online)
4. Facility Findings and Recommendations
  - a. [American Samoa](#)
  - b. [CNMI](#)
  - c. [Guam](#)
  - d. [USVI](#)
5. Site Improvement Recommendations (online versions limited to site maps)
  - a. [American Samoa](#)
  - b. [CNMI](#)
  - c. [Guam](#)
  - d. [USVI](#)
6. [Indoor Environmental Quality Handbook](#)
7. Workshop Reports
  - a. [American Samoa](#)
  - b. [CNMI](#)
8. [Energy Audit Implementation Plan](#)



## 1. INTRODUCTION

The US Office of Insular Affairs' (OIA) Insular ABCs Initiative is a multi-phase effort focused on improving the physical condition of the US Insular Area Public Schools (in Guam, Commonwealth of Northern Mariana Islands (CNMI), American Samoa and the US Virgin Islands). OIA has retained the US Army Corps of Engineers, Honolulu District to manage the Initiative. The Corps has, in turn, retained HHF Planners as the A/E project manager. The "ABCs Team" referred to in this report consists of the Corps' Project Management team and the HHF Planners team consisting of Honolulu based planners, architects and engineers and embedded personnel in each of the four territories.

Overall Lead	USACE Honolulu District
Consulting Team Leader/ Facility Planners	Helber Hastert & Fee Planners, Inc.
Architect	Mason Architects, Inc.
Structural Engineer	Martin & Chock, Inc.
Mechanical Engineer	InSynergy Engineering, Inc.
Electrical Engineer	InSynergy Engineering, Inc.
Civil Engineer	Austin Tsutsumi & Associates, Inc.

The Initiative has been sequenced in three major phases: an initial feasibility study and inventory phase completed in 2011 (Phase I); a comprehensive school building condition assessment completed in 2013 (Phase II); and Phase III which commenced in late 2014 and expected to extend through Fiscal Year 2019. This report focuses on the accomplishments of the first year of Phase III.

OIA established two major objectives for Phase III: to reduce the amount of deferred maintenance (DM) projects starting with the highest priority projects; and 2) build local capacity to prevent the DM backlog from re-occurring. The DM reduction portion Phase III is divided into two general sub phases: 1) development of a multi-year work plan; and 2) embedding facility managers in each local school agency to manage the work orders. The Work Plan essentially converted thousands of items identified in the Phase II condition assessment into preliminary work orders, sorted by priority. Program Managers for each territory were deployed in October 2015 and have begun to manage work plan execution.

A more detailed discussion of the accomplishments of Year 1 of Phase III is provided on the following pages.

**2. ABCs PHASE III TASK 1 (PHASE 3.1)**

Table 1 below summarizes the major accomplishments of Year 1 and provides an outline of the summary report.

**Table 1 - Major Accomplishments of the Year 1 Work Effort**

<ol style="list-style-type: none"> <li>1. Agreements             <ol style="list-style-type: none"> <li>a. Memorandum of Understanding for funding agreement</li> <li>b. Operating Agreement to establish territory, management team, and federal roles</li> </ol> </li> </ol>
<ol style="list-style-type: none"> <li>2. Work Plan             <ol style="list-style-type: none"> <li>a. Prioritization: establish implementation strategy method/prioritization criteria</li> <li>b. Data updates: school visits, check priorities with funding, revise condition data including ratings, priority flags, demolition considerations, and costs</li> <li>c. Site Projects: civil engineers to schools for detailed job descriptions and cost estimates</li> <li>d. Energy Conservation Measures (ECM): consultation amongst federal and territorial agencies to explore funding and project execution opportunities</li> </ol> </li> </ol>
<ol style="list-style-type: none"> <li>3. Education and Training Plan:             <ol style="list-style-type: none"> <li>a. Comprehensive framework and responsibilities established in the operating agreement</li> <li>b. School Facility Master Planning Workshop presentations: Framework for school facility planning processes and data points to be tracked for standardized Capital Improvement Project (CIP) planning development and update</li> <li>c. Indoor Environmental Quality (IEQ) Handbook: primers/ checklists for school staff and district facility managers to monitor classroom conditions</li> </ol> </li> </ol>
<ol style="list-style-type: none"> <li>4. Embedded Teams. ABCs Team members are being embedded in local school districts to manage DM projects and implement the EAM system.</li> </ol>
<ol style="list-style-type: none"> <li>5. Enterprise Asset Management System (EAMS): develop/ operationalize system to support facility management efforts (e.g., entering/ tracking work orders), help automate maintenance and repair schedules, and support operations and maintenance budgeting as well as CIP planning efforts.</li> </ol>

The ABCs Team conducted three sets of trips to each of the territories summarized below:

- Trip 1 (Feb-Apr 2015): kickoff briefs, facility/site inspector visits to validate or update draft work plan data
- Trip 2 (Jun – Jul 2015): presentation of draft work plans and draft Operating Agreements needed to implement the plan, proposed EAM modules, and CIP planning workshops to establish long range visions, facility standards and policies, investment strategies, and needed data points
- Trip 3 (Oct-Nov 2015): Work plan updates and Program Manager introductions

Phase 3.1 objectives are complete, with the exception of EAMS training in the territories, and the ABCs Team has transitioned to managing work plan implementation and other aspects of Task 2.

## 2.1 Agreements

### 2.1.1 Memorandum of Understanding

Memorandum of Understanding (MOU) between each territorial Governor and OIA were executed at the outset of Phase III to demonstrate a mutual commitment to provide functional and safe schools to create the best possible learning environment for school children. The MOUs affirm the Governors' desire to continue the Insular ABCs initiative, working collaboratively, to assess and improve K-12 public school facilities. Through the MOU, both parties agreed to cooperate on Phase III of the Insular ABCs initiative, which included technical support from OIA (i.e., the ABCs Team), with the understanding that the Governor set aside a minimum of \$1 million of OIA's annual CIP grant funding for the DMRP, for a period of five years. The Governors were also encouraged to set aside additional local funds to support the initiative (the USVI Governor set aside an additional \$2 million).

The MOU also established the key points of contact, composition of the ABCs Team, accountability, funding arrangements, and roles in support of the program. MOUs were signed by the Governor of each territory on:

- American Samoa: November 14, 2014
- CNMI: June 17, 2014
- Guam: April 1, 2015
- USVI: September 22, 2014

The MOUs are effective through the completion of Phase III.

### 2.1.2 Operating Agreement

The first round of ABCs-Team trips included meetings with "host agency" staff to clarify local project delivery processes and roles of various agencies. Host agencies are typically the local Departments of Education with the exception of American Samoa where the Department of Public Works is responsible for school maintenance and repair functions. Through these discussions, the ABCs Team mapped the organizational relationships between the planned embedded team and local counterparts, and how the various positions would work in concert to optimize support for ongoing initiatives as well as the planned DMRP efforts. The Operating Agreements cover the working relationship and roles and responsibilities of the ABCs Team and the host agency to implement the provisions of the MOU.

As defined in the Operating Agreement, there are two key documents to guide Phase III, and more specifically, the DMRP: 1) this Operating Agreement; and 2) the work plan that identifies the authorized projects and project sequencing. The agreement also underscores OIAs two mutually reinforcing objectives: to reduce the DM backlog and to build local capacity.

The Operating Agreements state that DMRP projects will be implemented following locally adopted codes, practices and procedures. Where outside design and construction expertise is required, local procurement, permitting and inspection processes will be followed. The host agency will coordinate



closely with other territorial agencies on the DMRP as a programmatic set of projects, focused on resolving serious health and safety issues in the public schools.

Operating agreements were fully executed on:

- American Samoa: July 10, 2015
- CNMI: July 31, 2015
- Guam: July 14, 2015
- USVI: July 22, 2015

The Operating Agreements are effective through Phase III completion and subject to annual review.

DMRP facility and site projects, and associated facility record keeping are being/will be managed by the ABCs Team with the support embedded staff consisting of:

1. Program Manager (PM) (on site since October 2015): in collaboration with the ABCs Team and the host agency, is now monitoring project status and funding, updating the DMRP work plan as needed and appropriate, coordinating work order timing, and providing annual briefings on progress as well as plans and budgets for the upcoming year. Updates to the Work Plan will be provided in July of each year. The PM is the lead local entity responsible for implementation of the Education and Training Plan (ETP - see summary in section 2.3). The PM will make reasonable efforts to maintain public awareness of the program.
2. Construction Specialist (CS) (yet to be hired): in cooperation with the PM and the host agency senior manager, the CS will oversee scope of work development, as well as the drafting of contractual documents needed for evaluating and engaging construction and other professional services, provide oversight during project execution, and ensure all aspects of project delivery are adequately documented.
3. EAMS Coordinator (EC) (yet to be hired): will ensure that the EAMS provides the primary gateway for personnel to coordinate and manage the DMRP (i.e., work order execution and tracking) as well as develop baseline facility data that will be used for maintenance, repair, and replacement scheduling (including manpower and material requirements). The EC will also oversee data input needed for related analysis and reporting. The EC will manage EAMS access for the various modules to the host agency as well as school-based staff. Respective staff will receive training and technical support as needed and practicable through the four year project period.

Embedded team members will need to develop a close, synergistic relationship with host agency staff to ensure coordination and appropriate levels of oversight to minimize scheduling conflicts and maintain efficient work flow.

In support of local capacity building efforts, and through the ETP, the ABCs Team will provide a range of education and training opportunities from documentation and data management to regular maintenance and construction practices. See section 2.3 for additional discussion on Year 1 accomplishments and a comprehensive summary of potential ETP topics.

## 2.2 Work Plan

### 2.2.1 Description

The Work Plan organizes all the DM projects by year and priority for each territory based on the projected level of funding available for each year. Individual Work Plans were prepared for each territory and were required to be formally adopted by OIA and each territory (see adoption dates below). The Work plans are expected to be periodically updated to account for completed work, changing priorities and available funding.

Work Plan adoption dates:

- American Samoa: September 21, 2015
- CNMI: September 10, 2015
- Guam: October 14, 2015
- USVI: September 1, 2015

The Work Plan development process involved the full ABCs Team, occupied most of the first year and involved development of objectives, prioritization criteria, updates to the 2013 inventory data and consultation with local agencies on local priorities and work identified in the 2013 condition assessment that had been completed.

In order to sort through the thousands of work items identified in the Phase II assessments, the project team conducted a series of working sessions at the beginning of Year 1 to establish prioritization criteria. These criteria allowed the ABCs Team to sort through the facility data in various ways and establish investment scenarios for local stakeholder consideration, and ultimately to formulate an overall capital investment strategy, or Work Plan 1.0. Steps in strategy development included defining prioritization criteria and priority levels for various project types, and identifying possible project exclusions to facilitate maximum coverage of priority projects with regard to funding possibilities and limitations.

Basic project prioritization, in descending order of importance, is described below:

1. Critical Health and Safety (H/S) issues that present an immediate or serious potential risk to occupant safety
2. Issues that affect other systems (e.g., building enclosure, site flooding)
3. Remaining H/S issues
4. Remaining issues sequenced by Phase II condition rating (0-5)
5. Further refinement as appropriate/needed:
  - a. School district priority considerations

- b. Classrooms could take priority over accessory structures as needed

H/S items were divided into three categories:

1. Critical: immediate risk of injury, or serious potential risk to student safety
2. Moderate health, safety or security problems; no immediate danger to life or property, but must be completed within a reasonable time
3. Environmental, or occasional, health, safety or security problem; can be programed for repair with other priorities

Work plans were developed for each territory phasing work to first address critical H/S concerns, including fire alarm system repair or installation priorities, as well as phasing site improvements through a hierarchy of priorities. Work plans considered bundling projects by type or whole-building repair needs, as well as the site improvement priorities with respect to other needs of schools. Further refinement of opportunities to correlate projects to minimize disturbance or maximize efficiency will be explored further by PMs during project execution. Project sequencing was established based primarily on the priority levels created by the multi-disciplinary ABCs Team (composed of facility planners, structural, electrical, mechanical, plumbing, fire protection, and civil engineers and architects). These subject matter experts (SMEs) conducted the original facility assessments in Phase II, the data updates in Phase 3.1, and will continue to support scope of work development as well as follow-on inspections and training throughout the next steps of Phase III. The priority levels, criteria, data filtering components, and descriptions of project types are explained further in territory-specific work plans.

#### **2.2.2 Data Updates – Facilities and Site Concerns**

Updating facility data and preparing for project execution required gathering data on work complete, revisiting schools with the highest priority problems (including those documented in Phase II as well as newly reported concerns), revising priorities based on new findings, updating the database to account for completed work, assigning objective and informed priorities to each DM item, organizing the DM data into groups, assigning items to work plan years based on funding limitations, and vetting data revisions and plans with the host agencies. The final product of this effort, the five year work plan, is only a start, based on current understandings of conditions and budget assumptions, and will be revised no less than annually to reflect condition changes, budget updates based on actual project costs, and general data refinement.

Updates to the condition data, made in the first year, included the addition of several fields to capture data revisions, such as priority changes, cost escalation, closed schools, and demolished buildings. As mentioned previously, fields were also added to help refine priorities, including more specific H/S categories and identifiers for building leaks and leak related issues. Other new fields were used to help determine potential concerns (e.g., hazardous materials, historic resources), and considerations for buildings currently not in use (e.g., demolition, condemnation). These additions and revisions contributed to building a system for filtering and categorizing DM items into priority levels, and

ultimately for building the DM reduction strategy. Data field additions needed for plan development include:

- Priority levels: grouped repair project types to inform investment strategies
- Capacity ranges: used to subdivide priority levels with higher priority to overcapacity schools
- Shelter/critical facility: identifier for special consideration or higher priority action
- Completed work (with SME/local contact comments): flagged items for follow-up inspection
- Design required: indications of permitted design requirements to sequence regulatory steps
- Civil design: includes two field definitions:
  - C0: Items that will most likely require General Extent of Work Site Plan/Possibly Grading Plan/Standard Details
  - C1: Items that will most likely require permitting and construction drawings
- Ground disturbance: indicates if the potential for significant ground disturbance exists or not
- Work plan year: entered for all items on the work plan to aid data filtering and EAMS migration

The Phase II survey produced ratings for various facility elements, as well as a preliminary identification of H/S issues. Project prioritization for Phase 3.1 was compiled from Phase II assessment results, based on facility element conditions and the potential hazards to building users. Since the Phase II assessments in 2013, much work has been completed throughout the territories, and at the beginning of Phase III in early 2015, it was assumed that some conditions had likely worsened. The ABCs Team compiled information on work complete, and the SMEs identified the highest priority concerns. The SMEs determined which buildings were most important to revisit in order to document facility condition changes. Approximately 10 to 15 percent of the school buildings were covered over a one week time period in each territory. The purpose of the follow on inspection was to:

- Receive updated input from cognizant local agencies and other stakeholders related to school conditions and priorities
- Confirm and review DM work completed since the Phase II condition assessment (2013)
- Update condition assessments for elements of concern
- Evaluate new Health/Safety issues
- Discuss and review issues of particular concern with cognizant local agencies
- Gather information on issues/elements of concern to develop and refine project recommendations to be included in the Work Plan.

New facility priorities are summarized in the respective SME Summary Reports for each territory.

### **2.2.3 Civil Projects**

A range of civil works projects (e.g., drainage, water, sewage, fire protection) were qualitatively assessed in Phase II, but associated costs were not estimated due to time constraints and information limitations. Phase 3.1 included follow-on surveys of key site items, descriptions of improvements needed to correct identified deficiencies, site maps outlining areas of concern, and cost estimates for the work needed.

Priority refinement and general work scopes were developed through consultation with staff and heads of local Public Works and Fire Departments, in addition to school facility managers. Applicable cost information was still very limited, so in many cases costs were estimated based on current Hawaii cost information. Actual project costs will be tracked as projects are executed and can be used to refine estimates and work plan budgets. Estimated costs of priority projects are summarized in Table 2.

A total of \$7.6 million in civil DM projects were identified – 82% of which related to drainage problems – a common issue across all territories.

**Table 2 - Summary of civil costs and project types (2015 dollars)**

Civil Subsystem	Am. Samoa (\$K)	CNMI (\$K)	Guam (\$K)	USVI (\$K)	Total (\$K)
Drainage Swales/Overall Drainage Pattern	\$821	\$898	\$1,308	\$774	<b>\$3,800</b>
Headwalls, Catch Basins & Drain Inlets	\$186	\$557	\$370	\$346	<b>\$1,460</b>
Retention/Detention Ponds	\$7	\$496	\$480	\$0	<b>\$983</b>
Fire Protection Distribution and Storage (Water Supply)	\$0	\$588	\$11	\$34	<b>\$632</b>
Septic Disposal Systems (Sanitary Sewer)	\$108	\$68	\$0	\$16	<b>\$192</b>
Potable Water Distribution and Storage (Water Supply)	\$45	\$75	\$26	\$36	<b>\$182</b>
Piping (Sanitary Sewer)	\$8	\$11	\$13	\$47	<b>\$79</b>
Fences & Gates (Site Development)	\$11	\$0	\$59	\$0	<b>\$70</b>
Fire Truck/Emergency Vehicle Access	\$0	\$46	\$0	\$0	<b>\$46</b>
Pumping Station(s) (Water Supply)	\$0	\$10	\$24	\$11	<b>\$45</b>
Erosion Control (Earthwork)	\$6	\$0	\$0	\$8	<b>\$14</b>
Paving & Surfacing (Pedestrian Paving)	\$0	\$0	\$11	\$0	<b>\$11</b>
Paving & Surfacing (Roadways)	\$0	\$0	\$7	\$0	<b>\$7</b>
Lift Stations/Emergency Generators (Sanitary Sewer)	\$0	\$2	\$0	\$0	<b>\$2</b>
<b>Total</b>	<b>\$1,200</b>	<b>\$2,800</b>	<b>\$2,400</b>	<b>\$1,300</b>	<b>\$7,600</b>

Civil DM reduction projects are divided into three or four priority categories, depending on the territory, so lower priority items will likely be delayed based on reconsideration of priorities and work plan revisions as the DMRP progresses. A number of these projects may be eligible to be incorporated into ongoing or planned CIP projects being funded or managed by the territories (e.g., “run on” flooding generated by adjacent roadways and properties, regional water system upgrades, etc.). Eligible improvements are tracked in the Work Plan, but flagged for possible independent funding (i.e., local DPWs may be able to fund projects to manage “run on” from public roads and other public property, etc.).

Most site projects require no work in previously undisturbed areas. Swale or drainage way maintenance may require the removal of migrated soils to restore originally designed drainage capacity. Soil removal for the restorative work is not expected to extend more than one foot below the existing ground surface. In most cases, drainage corrections will be accomplished with the addition of soil vice removal. Site maps for each school, indicating the specific types of DM work required, are available in the

accompanying CD found at the back of this report if in print or available for download at <http://hhfplanners.com/>.

**2.2.4 Energy Efficiency and Conservation Measures**

Energy audits for each school were prepared as part of the Phase II effort indicating a potential annual savings of almost \$9 million in the Insular Areas. The audits were updated in Phase III via extensive consultation with various agencies through phone conferences, email correspondence, and in person interviews during territory visits. Past or ongoing efforts, as well as possibilities for future initiatives were also investigated. Consultations included:

- OIA and USACE representatives
- National Renewable Energy Lab
- Territorial Energy Offices
- Territorial Water and Power Authorities

Based on Phase III consultations, its clear there is a significant scarcity of funding to address efficiency or conservation measures in most of the territories unless they can be incorporated into high priority Work Plan projects. On the plus side, energy costs (electricity and water service) have dropped from the 2013 levels, but still represent some of the largest school facility operating costs. Table 3 provides an updated snapshot of potential energy saving: an investment of \$69.3 million is estimated to yield an annual savings of \$8.4 million representing an 8.25-year simple payback.

**Table 3 - Impact of Primary ECM Implementation on DM and Energy Costs**

Territory	Total DM (\$M) (2015)	Total Recommended Priority ECM Cost (\$M)	Total Estimated Energy Savings for Priority ECM Implementation (\$M)	Additional DM that can be funded through the ESPC program based on a 15-year simple payback (\$M)
Am. Samoa	\$10.0	\$9.1	\$1.1	\$7.1
CNMI	\$11.3	\$11.1	\$1.5	\$11.4
Guam	\$89.9	\$14.1	\$1.6	\$10.5
USVI	\$66.2	\$35.0	\$4.2	\$27.7
Total	\$177.4	\$69.3	\$8.4	\$56.7

To address this funding shortfall, the ABCs Team recommends that the territories consider Energy Savings Performance Contracts (ESPCs) as an alternative contracting mechanism that would allow the schools to cover some of the required capital improvements without having to rely on direct government appropriations, tax receipts or bonds. The ESPCs would use private financing to cover the up-front costs and install and maintain the system improvements, while allowing the school districts to repay the loans using the utility savings realized by the improvements over the life of the contracts.

Piggybacking DM work with ECM projects (installation of a cool roof reduces energy consumption and also recapitalizes the roof system; kitchen and bathroom fixture upgrades and relamping programs increase energy conservation as well as level of service, etc.) through ESPCs would help cover a great

amount of DM with no increase to the costs that the schools are already paying. Longer term payback periods, in addition to adding in substantial amount of DM repairs, could yield lower interest loans.

Status of territorial ESPC ventures:

- USVI has an effective ESPC program in place to support the implementation of energy saving measures and other related improvements within the schools. The USVI ESPC program is administered by the VI Energy Office, which currently manages an ESPC open end contract with two ESPC contractors. VIDE has been reluctant to utilize the ESPC vehicle because of perceived cost differentials with its existing funding sources, and concerns on the overall financial responsibility on how the ESPC set-up costs and auditing costs would be covered.
- American Samoa is currently establishing programs for renewable energy and ESPC through the American Samoa Renewable Energy Committee (<http://www.asrec.net>), of which the American Samoa Power Authority is a member organization. ASREC was established by executive charter and is charged with developing a long term strategic energy plan that creates a sustainable energy future for American Samoa with input from various sectors and stakeholders. There are a broad range of energy initiatives underway including a plan to make the Manua District 100% reliant on renewable energy. There are no ESPC vehicles available at the time of this writing.
- The Guam Power Authority manages an ESPC program for the territory to implement ECMs at the airport and for other agencies, but like VIDE, Guam DOE has not been amenable to using GPA's ESPC program because of perceived cost differentials with its existing funding sources, and concerns on the overall financial responsibility on how the ESPC set-up costs and auditing costs would be covered.
- CNMI currently does not have an ESPC program in place and the school district does not have the finances to implement an ESPC program utilizing their own resources. It should also be noted that the PSS is delinquent in keeping up with its utility bill payments to the local utility agency (CUC), so the opportunity to borrow money under ESPC vehicles is restricted without some outside support.

Executing an ESPC pilot project could help build potential for larger initiatives and could include projects as simple as kitchen equipment upgrades or larger initiatives such as battery energy storage systems and PV panels at adjacent schools to create net zero islands.

### **2.3 Education and Training Plan**

OIA's parallel object in Phase III is to build local capacity, and the primary vehicle for that is the Education and Training Plan which was initially conceived in the Operating Agreement. The DM backlog (the reduction of which is the other OIA objective) occurred due to a lapse in the territory's ability to support an adequately funded repair and maintenance program due to the chronic lack of funding,

scarcity of qualified staff and higher priorities for public funds. The ETP is focused on raising awareness on the value of an adequately funded R&M program (e.g., more cost effective to conduct routine maintenance than to deal with premature building system failure), the broader issues of school facility planning, programming and budgeting, and building local technical and vocational skills and safety awareness related to school facility construction. The long-term success of the plan is highly dependent on the level of local engagement; the ABCs Team led by the PMs will provide facilitation and leadership at a programmatic level, but host and sister agencies, vocational/technical training agencies, and private sector engagement is going to be essential for success.

**Table 4 - Examples of education and training topics to be provided**

Management	Technical skills	Job/School Site
Asset management principles	EAMS introduction	Job site safety
Campus planning principles	EAMS desktop	Construction best practices
Lifecycle cost analysis techniques	EAMS user group support	Structural repair systems
Sustainable design	Scope writing	Concrete forming
Maintenance and capital renewal budgets	Building Code primer	HVAC maintenance
NEPA basics		Grounds maintenance primer

Several of the identified tasks were addressed in the first year as described below.

**2.3.1 Workshops – School Facility Master Planning**

The ABCs Team was invited to conduct workshops in two of the four territories focused on the school facility master planning process (e.g., establishing a local policy framework, long range plan, short range implementation strategy, CIP plans and facility standards). Invitations were directed to school administrators, educators and maintenance personnel, in several instances legislative committee chairs involved with education and PTA leaders were also involved. The workshops were very interactive and designed to engage participants through the use of small breakout groups and group reporting, and a range of topics to help broaden a shared understanding of the challenges that facility managers and school administrators face, the breadth of considerations that go into designing and maintaining schools, and some strategies for streamlining facility management efforts and addressing common concerns. The workshops took place over a two-day period, with a full day of presentations and work sessions on the first day and a half day on the second day. Topics on the first day focused on defining adequate space and site design. Presentations and activities on the second day focused on planning and administration metrics.

**Table 5 - Workshop Objectives**

**Day 1**

Planning Element	Discussion Topics
Visioning for future school facility needs	<ol style="list-style-type: none"> <li>1. What is an ideal school?</li> <li>2. What facility components are needed to support ideal learning environments?</li> </ol>
Elements of campus planning	<ol style="list-style-type: none"> <li>1. Facility requirements</li> </ol>



	<ol style="list-style-type: none"> <li>2. Functional relationships</li> <li>3. Site design/facility layout exercise</li> </ol>
Indoor Environmental Quality	<ol style="list-style-type: none"> <li>1. Ubiquitous and most dire concerns</li> <li>2. Retrofit possibilities</li> </ol>

**Day 2**

Planning Element	Discussion Questions
Enrollment Projections	<ol style="list-style-type: none"> <li>1. Future population trends</li> <li>2. Adaptation strategies for enrollment changes</li> </ol>
Repair and Maintenance Budgeting and Management Techniques	<ol style="list-style-type: none"> <li>1. Standard estimation techniques</li> <li>2. Nationwide trends in operations and maintenance spending</li> <li>3. Need for EAMS system to track facility condition and support budget requests</li> </ol>

Participants were encouraged to ask questions and provide suggestions to improve the process as well as articulating visions for their school district. The workshop were highly interactive with various outputs including records of input gathered during working sessions, goals and action recommendations from facilitator notes and post-it-note boards, mapping of growth areas and capacity notes, and full record reports. Feedback on the content and outcome of the workshops was highly positive and recognized as providing participants a meaningful way to express their thoughts, in addition to raising awareness on the interconnectivity of school facility related matters. Participants were interested to hear more about cost effective construction practices, maintenance options, and grant funding possibilities. Participants were also interested in holding similar sessions regularly in the future to discuss needs and progress. These can be explored in future education and training efforts. Reports documenting the workshops and input provided are also available on the project website.

**2.3.1 Indoor Environmental Quality Handbook**

The Phase 3.1 objective of the IEQ effort was to take the Phase II school-by-school IEQ recommendations and develop a primer and checklists to be used by school staff and administrators, as well as district facility managers to monitor progress towards improving classroom IEQ. As has been documented in studies conducted by various organizations, the quality of students' learning environment, including the four sectors of the ABCs IEQ assessment (thermal comfort, indoor air quality, visual comfort/lighting, and acoustical performance) affects student behavior, test scores, and dropout rates, as well as teacher retention. Addressing these issues in school facilities positively affects educational goals in the near term and various aspects of community wellness over time.

The guide can be used to gain awareness of common facility concerns with descriptions of the causes and impacts of those problems on the learning environment, as well as possible solutions that can be employed to remedy the problem in existing buildings or avoid it all together if the recommendation is incorporated into the design of new buildings or major renovations. Recommendations range from readily achievable improvements such as screens or fans, larger site specific possibilities such as

landscaping or other exterior improvements, or inventory-wide capital improvements such as building insulation and window upgrades.

All of the schools assessed under the Insular ABCs initiative are considered to be in tropical coastal environments, and subject to harsh weathering conditions due to salty humid air, prolonged exposure to high temperatures, and severe storms. These conditions cause accelerated deterioration of materials, which can lead to subsequent impacts to other materials. Related concerns and mitigation strategies are discussed in Appendix A of the IEQ Handbook.

To support the use of the IEQ Handbook, Appendix B includes checklists for visual inspection of buildings and classrooms. These are broken into the four main categories and includes a brief section on pests, since the impacts of pests can also affect the health of students and facility conditions. Each line item explains what the surveyor should look for, and provides spaces to indicate whether or not the issue is present. As problems are identified, the IEQ Handbook can be used to explore ways to address the issues.

During work plan development the ABCs Team considered the feasibility of addressing some of the previously documented IEQ concerns during DMRP project execution. In some cases the concerns align with the DM items that are programmed for repair work, but in many cases the IEQ concerns are linked to interconnected issues that would have to be addressed through larger scale capital improvement initiatives or passive solutions that differ from the bounds of the DMRP. Indications of those items that could be addressed in the DMRP and those that would not, are itemized in IEQ Handbook Appendix C.

#### **2.4 Embedded Teams**

A key component of the DMRP is to embed qualified staff in the host agencies to manage the program. The ABCs Team developed program management and embedded team recruitment and retention policies including the definition of basic qualifications as well as development of a recruitment strategy and an evaluation process to measure performance. At least three positions were identified for each territory (PM, CS, and EC—discussed in Section 2.2) and recruitment strategies were prepared for each. Job ads were published nationally and locally in late May and application review and interviews were conducted July through August.

Applications were reviewed and rated based on five general criteria: compliance with the request for qualifications, work experience, territory experience, credentials/skills, references, and overall quality of the application. These points were scored based on a weighted scoring system for a total possible score of 100. Higher scoring applicants were contacted for phone interviews. Those candidates that rated the highest were flagged for further consideration and HPH followed up with references to get more information about performance, professionalism, and commitment to their work. Funding was only available for PMs; the CS and EC positions are to be recruited when funding becomes available. Based on the evaluation process, PMs were recruited for each of the territories and started work in late October 2015.

PMs in each territory spent time in the last months of 2015 meeting with their local colleagues getting familiar with project delivery processes and contracting requirements, as well as learning of local contractor and design professional capabilities and capacity. The PMs have now established strong working relationships with host agency managers. These relationships will facilitate DMRP coordination between the ABCs Team and related local agencies.

## **2.5 EAMS – Software Selection and Development**

The ABCs Team evaluated software solutions to support facility management functions. Based on market research, consultations with school district facility managers and related personnel, as well as observations made during the development of the Phase II Facility Information Management system (FIMS), the planning team identified three main EAM components that are needed. These components would help to manage maintenance and replacement schedules, track budgets, justify shortfalls, track performance, and get to steady state that focuses on scheduled maintenance and reduced responses to trouble calls. The data provided by this system, once related data points are populated by the system users and administrators, would also help define budget and staffing requirements. Developing an EAMS was determined to be particularly important to support the five-year implementation plan. Core functionality of the proposed EAMS required that potential systems include components to address:

1. Work order development and management
2. Preventative maintenance (PM) scheduling and budgeting
3. Managing and reporting data for medium to long range CIP plan budgets

Based on a comprehensive evaluation, IBM's Maximo Asset Management system was selected as the platform best suited for the ABCs initiative. Development of the EAMS platform began in mid-2015. Due to data requirements beyond that which was gathered during the Phase II assessments, or is otherwise unavailable, initial buildout is limited to establishing the system architecture and asset hierarchy, inputting Phase II facility data, entering all DM items as work orders requiring action, and tracking DMRP progress as DM items move through design reviews, contracting and procurement stages, construction, and documentation.

Input of additional facility data is required to establish regular and preventive maintenance schedules which can be used for assigning daily tasks as well as informing budgeting processes and providing data for medium-to-long range capital improvement planning budgets. The first step planned for the first year effort, basic functionality, includes work order management for the DMRP (e.g., programming and budgeting). In future rollouts, the system will be accessible by administrators for needed key performance indicators and reporting, as well as facility managers for job plan creation, work scheduling, assignment and status updates. The work order management module is a powerful tool providing the ability to assign individuals the responsibility to act on work, streamline approval processes, track labor hours and costs, track material or equipment needs, and document the entire process from start to finish.

### **3. PHASE 3.2 OVERVIEW**

The second year of Phase III, Phase 3.2, will be the first full year of an anticipated four-year project. Accomplishing the overarching objectives for Phase III (improve facility and site conditions per the annual work plan, and to assist long-term facility management capability through the ETP) requires multifaceted efforts, the most significant of which includes reducing the DM backlog. Other Phase 3.2 efforts include facility and site data updates (e.g., subsequent condition assessments), ETP initiatives, ABCs Team recruitment, and additional EAMS buildout.

#### **3.1 Agreements**

The Operating Agreements established in Phase 3.1 will be reviewed with the host agencies and updated as necessary. As the DMRP work progresses, the ABCs Team is learning of capacity constraints and challenges of various supporting positions and opportunities to improve the business process. These insights will be shared regularly with the host agency and may result in changes to the operating agreement.

#### **3.2 Work Plan**

##### **3.2.1 Implementation**

Project funding is set by an Authorization to Proceed (ATP) issued by OIA. ATP prerequisites include compliance with National Environmental Policy Act provisions and being an authorized Work Plan project. USACE is supporting the territories in satisfying NEPA compliance through a series of “Records of Environmental Consideration” or RECs.

Preparation and review of engineering designs and construction details are needed to move projects through the procurement and acquisition process. The ABCs Team of architects, civil, structural and MEP engineers play an important role to ensure each territory receives competent and timely services to move DM projects into the pipeline. The architectural and engineering services provided by the ABCs Team is and will be critical in providing design review, project scoping and specifications, and design services (where local licensing laws permit).

##### **3.2.2 Facility Condition Data Updates**

The ABCs A/E team, which developed the original building inspection methodology for the comprehensive Phase II building condition assessment effort, will conduct and oversee two additional condition assessments of the full school inventory during the four year work period to monitor progress and possibly identifying new high priority DM items. Phase 3.2 may include assessment of a percentage of the inventory in each territory, and will include a training component to transfer this approach to qualified local counterparts to be continued as a regular facility management practice. Training will be conducted in a way such that the second inspection, due at the end of the five-year project (late FY 19), can be conducted largely by a local team, with some oversight and quality control provided by the ABCs Team. While the embedded team will bear most of the responsibility for management and logistics of the inspection, the A/E team members will provide the hands on training and technical oversight.

### **3.3 Education and Training Plan**

Capacity building activities are essential to help facility managers operate as efficiently as possible to maximize use of limited funds, as well as to provide training on facility standards and construction techniques as needed. The ETP provides an important framework for achieving this objective (see Section 2.3 discussion). One of the highest training priorities in Phase 3.2 is for work order management and facility or site asset data entry. These components lay the framework for all anticipated functionality of the EAMS and its use in assisting facility management responsibilities. Associated training will help facility managers and related administrators maximize use of this valuable tool.

The ABCs Team will prepare training material and deliver training to embedded team members to provide basic system understanding, required procedures for work order management and documentation, steps for building out inventory assets for system updates, and data entry and analysis required for regular facility data reporting. The ABCs Team will also continue efforts to coordinate with territorial facility managers and potential EAMS users to keep them informed of system functionality as modules are deployed and enhanced. Regular meetings will be held to build understanding of and confidence in the system, as well as to encourage effective system use.

As a part of the EAMS build out, the ABCs Team will work with the host agency on maintenance, repair, replacement scheduling and budgeting. Life cycle cost analysis as well as maintenance and capital renewal budgeting techniques, items reviewed in the Phase 3.1 school facility planning workshops, will be explored further as a part of the ETP initiative. Related EAMS components will be operationalized for task alerts and medium to long term O&M budgeting.

The Team will reach out to and seek to collaborate with existing ETP service providers such as vocational and technical schools, contractors associations, etc., to provide regular education and training opportunities for all levels of the ABCs' stakeholders. The plan will also address a schedule to transition responsibility of the DMRP to the local government through the course of the 4-year program.

ETP initiatives will be defined annually as the work period proceeds.

### **3.4 Embedded Teams**

The key objective in Year 2 will be to complete the embedded teams by hiring and training the CS and EC positions. These are critical positions that are required to manage and oversee the DMRP.

The ABCs Team senior managers will continue to provide oversight of embedded staff and direct efforts related to the DM reduction and process improvement objectives of Phase III. The ABCs Team will assist with the provision of A/E services as practicable and requested by the School Districts. These services are critical to ensure each territory receives competent and timely technical support to move DM projects forward to implementation.

### **3.5 EAMS – Standup in the Territories and Buildout**

Task 2 begins with EAMS standup in each territory to manage work order execution, organize construction documents, and provide a portal for senior management to monitor performance across

the entire inventory. Training, as discussed in Section 2.3, in combination with continued buildout of the inventory data as well as maintenance, repair, and replacement scheduling will facilitate greater facility management capabilities.