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# **THE HURRICANE IVAN SOCIAL SECTOR INFRASTRUCTURE REPAIR AND RECONSTRUCTION PROJECT (HISSIRR)**

## **FINAL REPORT**

**MAY 2005**

*Contract No. 532-C-00-05-00007-00*  
*Cognizant Technical Officer: Sonjai Reynolds-Cooper, USAID/J-CAR*

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# **The Hurricane Ivan Social Sector Infrastructure Repair and Reconstruction in Jamaica Project**

**Final Report under  
Contract No. 532-C-00-05-00007-00**

**Submitted to:  
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## **I. EXECUTIVE SUMMARY**

The Hurricane Ivan Social Sector Infrastructure Repair and Reconstruction in Jamaica Project restored 95 facilities to pre-hurricane conditions or better and fully achieved the project objectives. In selecting these facilities DevTech had conducted nearly 150 assessments of facilities in order to ascertain which of them legitimately qualified under project criteria.

The facilities repaired included 26 schools, including one university, 66 clinics, or community health centers, and three NGOs. The 95 facilities are situated in each of the three regions of Jamaica and in every one of the country's parishes. Once construction began on January 18, 2005, the project repaired an average of one facility per working day and 1.75 self-standing structures per day.

The final repairs brought better conditions for study and health care to over 32,000 clients, or direct beneficiaries of the facilities. It brought potential benefits to an estimated one million people in the population areas most directly served by the facilities.

To implement the work of reconstruction and repair, DevTech awarded 13 subcontracts to nine subcontractors. The total value of these subcontracts—hence the direct cost of repairs—was approximately \$2.3 million with an average subcontract value of \$177,080. Data illustrate that the project followed prudent fiscal management in never allowing total disbursements to subcontractors to exceed, as a percentage of budget, the percentage of work completed. One positive consequence of this cautious management was an increase to the subcontract line item of the project of less than two percent, in spite of numerous adjustments and amendments necessary to accommodate shifting goals and priorities received from USAID and the Office of National Reconstruction.

Project management included several instruments designed for monitoring results and for gathering and storing data. The detailed work plan and performance monitoring plan prepared during project start-up facilitated tracking of scheduled tasks and ascertaining completion. The mid-term evaluation determined the status of progress and noted ongoing strengths and possible weaknesses to be sustained or addressed. Performance monitoring and satisfaction monitoring questionnaires served to collect information related to facilities and subcontract progress as well as to clients' degree of approval of the repairs at their sites. All of this information was stored in a relational database program tailored to this activity's requirements. The database permits accurate and timely reporting on virtually any aspect of the project.

The nature, scope, and pace of the project led to a number of lessons learned. The need to clearly define what was meant by "hurricane damage" became abundantly clear very quickly, as did the need to carry out an overall assessment—as opposed to the phased in assessment that was carried out. The importance of communicating with government and local officials as well as community members is highlighted, as well as establishing and implementing reporting and monitoring procedures and roles. Finally, USAID's role in defining expectations and facilitating working relationships with the Government of Jamaica is noted.

## **II. INTRODUCTION**

This report presents the final status of USAID's Hurricane Ivan Social Sector Infrastructure Repair and Reconstruction in Jamaica Project, an intervention implemented by DevTech Systems, Inc. as an emergency response to structural damage caused by the storm to a selected number of schools, health clinics, and NGOs.

The purpose of the report is to provide USAID/Jamaica and other stakeholders with a just assessment of the achievements and lessons learned during the implementation of the activity. Owing to the brief duration of the project, the report is a sequel to the Mid-Term Evaluation Report written in February of this year and will benefit from a previous reading of that document. It is not, however, merely an actualization of the mid-term study: rather than follow the details of project progress, the Final Report focuses on the success of the contractor in achieving the activity's ultimate purpose as defined by USAID. It then explores in some depth the experiences which either supported or hindered accomplishment of objectives. One hopes that these lessons learned may contribute to the planning and implementation of similar projects wherever they take place.

This Final Report often references the original performance monitoring and work plans prepared by DevTech Systems at project outset. In substantiating outcomes and in analyzing performance, it drew intensively from the monitoring database that DevTech built for the project during the course of implementation. It was these instruments that permitted the accuracy, detail, and comprehensiveness of the present report.

The report was prepared in Kingston, Jamaica during the close-out week of the project, from May 15–21, 2005, and finalized in Arlington, VA the following week. The data on which it is based was complete and final with a very few, minor exceptions. The cost per person directly affected by Project repairs was approximately seventy dollars; the cost per indirect beneficiary was about two dollars.

## **III. PROJECT ACHIEVEMENTS**

### **A. Achievement of Project Purpose**

The stated purpose of the Hurricane Ivan Social Sector Infrastructure Repair and Reconstruction in Jamaica Project (the project) was to restore selected Jamaican social-sector infrastructure to pre-Hurricane Ivan levels or better.

Following a series of approximately 150 field assessments and discussions with USAID and the Office of National Reconstruction (ONR), 95 facilities were selected for repair. By the end of project, it had achieved the following outputs:

95 facilities were restored to pre-hurricane conditions or better. (As some facilities comprised more than one building, the project restored a total of 179 self-standing structures to pre-hurricane conditions – or better.)

The actual labor of construction began January 18, 2005 and was complete on the final structure by May 12. The restorations took place in every one of the fourteen parishes of Jamaica, including the most geographically distant locations from Kingston (see Table 1 in the annexes).

Since signing of the first construction subcontract on January 17, 2005, the project completed an average of nearly one facility and over one-and-three-quarters structures per day.

While each restoration was only certified as complete after a USAID/Wingerts' engineer and a DevTech project engineer examined the work, DevTech also solicited non-technical responses from the principals, head nurses, and supervisors of the facilities. Eighty-six percent of respondents considered the restoration to have attained pre-hurricane conditions or better, while 60 percent considered the work totally satisfactory and 38 percent partially satisfactory. These percentages indicate an appreciably high level of success in pleasing clients in a demanding project of very short duration.

In sum, DevTech fully achieved the purpose of the project. It accomplished its objectives with a remarkable pace of deployment, covered every major political subdivision of the country, trained local small businesses in procurement and work standards, and maintained a high level of quality control throughout.

## **B. Project Tasks**

By completing the repairs of 66 clinics, 26 schools, and 3 NGOs, the Project achieved all intermediate results in the three reconstruction task areas of the Performance Monitoring Plan (PMP) and Work Plan.

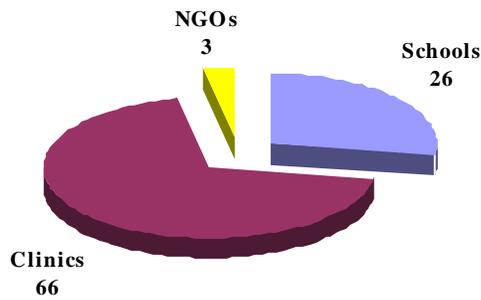
The Work Plan and its companion PMP laid out four task areas:

- Project Start-up: Office setup, damage assessment, bidding workshops, etc.
- Repair and Refurbishment of Educational Facilities
- Repair and Refurbishment of Health Facilities
- Repair of NGO Facilities

The first of the tasks was completed in 2004 and received a positive assessment in the Mid-Term Evaluation Report. Except for occasional comments on Task 1, this report will focus on the three reconstruction tasks. These remained as planned except that USAID revised the requirement for refurbishment of health clinics, eliminating it entirely due to the availability and cost of items required by the clinics. The results of the three reconstruction tasks can be stated in terms of facilities:

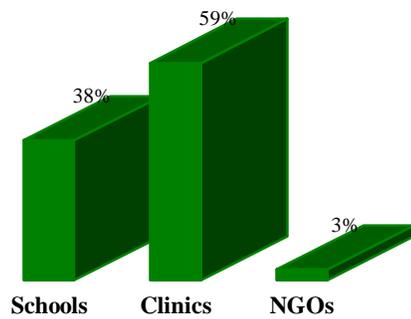
Of the 95 sites retained for work under the Project, clinics represented two-thirds, schools under a third, and NGOs only three of the total. The following chart shows the allocation of work by type of facility.

### Facilities by Type



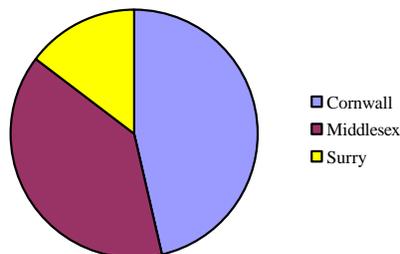
The breakdown of costs per facility type remains close to the percentages of sites to whole. Schools, however, absorbed slightly more of the budget largely owing to the extensive work required to repair hurricane damage at the large CASE Institute, the single university site included in the Project’s inventory. These proportions, along with expenditures per type in U.S. dollars, are illustrated below.

### Costs by Facility Type



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### Facilities by Region



While the few NGOs restored are situated in the Kingston and St. Andrew parishes only, schools repaired covered eleven and clinics twelve parishes across the three regions of Jamaica. Broad regional coverage was generally proportionate to the geographical size of regions and did not concentrate near the capital. The regional coverage can be expressed graphically above.

The criteria for restoration, as expressed by indicators in the Performance Monitoring Plan, were fully realized by end of project. One of the indicators for the three reconstruction tasks referred to beneficiaries, discussed in the following section.

### C. Beneficiaries

The Project benefited over 32,000 direct users of the facilities.

The Project brought potential benefits to over one million Jamaicans in the population areas most directly served by each facility.

The Project discriminates two categories of beneficiaries. The first group, designated as direct beneficiaries, comprises those individuals who regularly frequent the sites repaired: students, teachers, administrative staff, nurses, directors, and patients. These are the primary clients of each facility. The second category, denoted indirect beneficiaries, constitutes the general population of the region the institution serves.<sup>1</sup> All data on both direct and indirect beneficiaries are approximate. The principals and supervisors responsible for the day-to-day management of the institutions provided seventy percent of this information. For the remaining thirty percent, the DevTech team extrapolated data according to internally agreed formulas.<sup>2</sup>

#### Beneficiaries by Facility Type

Facility	Direct Beneficiaries	Indirect Beneficiaries
Schools	13,136	279,745
Clinics	17,773	830,207
NGOs	1,825	35,000
<b>TOTAL</b>	<b>32,734</b>	<b>1,144,952</b>

<sup>1</sup> Respondents were asked to estimate the general population for only those districts from which 90 percent of their students or clinic visits originated.

<sup>2</sup> For clinics, missing data was completed by comparing with available data from clinics most similar in size. For indirect beneficiaries, existing information allowed deriving average ratios for population served per client base (students, staff); applying the resulting ratios provided a reasonable estimate to complete missing data on populations served. A few outliers were eliminated from the calculations.

A few clinics and one NGO had some population data that was unrealistically high. We took those facilities whose population served/client ratio exceeded one standard deviation of the mean and then re-estimated them using the new ratio.

The numbers for indirect beneficiaries are conservative, since DevTech did not adhere to the customary practice in Jamaica of calculating the population served by a facility as that of the entire area from which it can draw students or visitors. Frequently schools and health centers have the ministerial authority to accept students or patients from areas exceeding 50,000 people. Given DevTech’s conservative practice of calculating only from the districts most served by a facility, the estimate of over one million indirect beneficiaries is reasonable. It can therefore be reasonably stated that the Project has offered potential benefits to a significant percentage of the country’s people.

Within the populations affected, children have benefited greatly, as they constitute the majority of direct beneficiaries of the schools just as mothers represent a majority of visitors to clinics.<sup>3</sup> Women across the board are the primary beneficiaries of the Project, since even within the student population there is a ratio of 6,539 girls to 5,831 boys.

Parishes also received widely distributed populations positively affected by the Project:

### Beneficiaries by Parish

Clarendon	5,732	242,506
Hanover	1,076	46,970
Kingston	2,754	56,120
Manchester	1,056	29,824
Portland	1,396	29,500
St. Ann	1,923	79,930
St. Catherine	8,980	242,495
St. Elizabeth	4,043	193,512
St. James	1,128	50,968
St. Mary	718	18,344
St. Thomas	1,195	67,040
Trelawny	1,320	33,059
Westmoreland	1,413	54,684
<b>TOTALS</b>	<b>32,734</b>	<b>1,144,952</b>

The cost per person directly affected by Project repairs was approximately seventy dollars; the cost per indirect beneficiary was about two dollars.<sup>4</sup>

<sup>3</sup> The statement in regard to mothers and clinics is based on anecdotal rather than firm data.

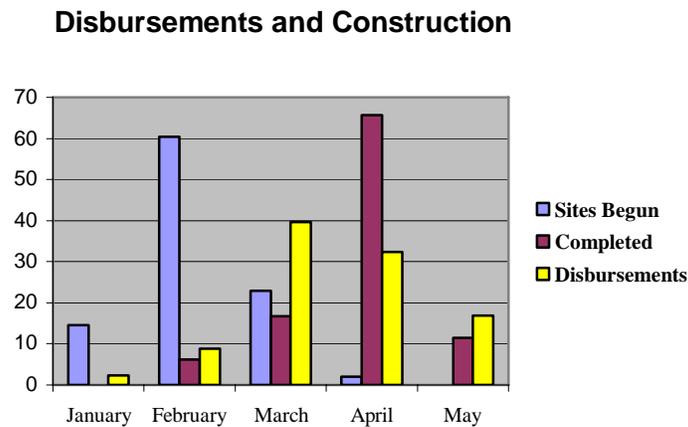
<sup>4</sup> Using a rounded figure of \$2.3 million as actual construction costs divided by the number of direct or indirect beneficiaries.

## D. Subcontracts

The Project issued thirteen subcontracts to eight small Jamaican construction firms and one to the Joint Board for Teacher Education; each contract was completed by project end.

“Contracts awarded for reconstruction work” constituted the fifth and last intermediate result under the Project Start-up Task Area in the Performance Monitoring Plan. The timeline in the Work Plan indicated a period of seven weeks for this process, beginning the last week in December.

The actual timeline was slightly under seven weeks and stretched from January 17–March 2, 2005. The delay in commencing contract signing was partially owing to a transition in project management towards the end of 2004, partially owing to shifting goals and priorities within USAID and the ONR. Completion dates for subcontracts ranged from April 14–May 9. Disbursements against the subcontracts follow a pattern that lies between dates of work begun and dates of completion of facilities:



Each pyramid of columns shows a midway surge, with a majority of site construction beginning in February, a majority of completions in April, and a majority of disbursements made in March and April. These are normal patterns in construction projects.

Of the eight reconstruction firms, one was awarded three subcontracts, two were awarded two subcontracts, and the others each had one subcontract. All subcontract packages included several facilities, and many facilities contained two or more self-standing buildings. The JBTE received a single subcontract award for the refurbishment of selected schools.

The Mid-Term Evaluation Report comments on the process of training interested local contracting companies in U.S. procurement procedures and in such matters as quality control, safety, site cleanliness, and proper invoicing. Certainly much of the activity’s success in meeting its objectives is owing to the careful planning and proficient delivery of the training seminars. These events constituted a small technical assistance component of this otherwise humanitarian project.

The total value of all subcontracts was approximately \$3 million, while the average contract value was just over \$175,000. The following table presents other subcontract values of interest.<sup>5</sup>

### Subcontract Values

Value all subcontracts	2,302,041
Mean value	177,080
Highest value	329,725
Lowest value	85,431

A table of all subcontracts is presented in Annex 2 of this report.

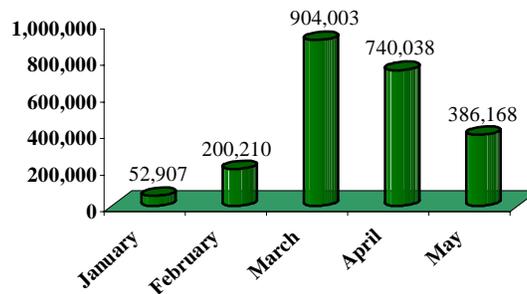
### E. Cost Containment

DevTech remained within the overall project budget through EOP.

The subcontract line was increased by less than two percent from the original figure.

That DevTech was able to remain under budget, and increase the line item for all subcontracts from \$2,279,000 to only \$2,327,000 reflects well on project management given the changes to project goals and the numerous amendments necessary to meet those goals. The chart below indicates the progress of disbursements.<sup>6</sup>

### Construction Disbursements

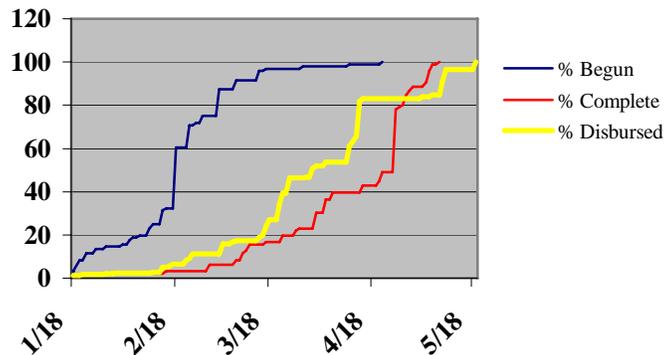


In the early months of implementation, the skewed pattern of disbursements raised concerns at USAID that the project was creating an unacceptable pipeline. As the figure below illustrates, the pattern makes sense in the context of a construction activity.

<sup>5</sup> Actual figures vary slightly according to the exchange rate used.

<sup>6</sup> The chart does not include contract payment to the JBTE.

### Disbursements and Completion



While a typical technical assistance project may show a flatter pattern of disbursements, a construction project will normally peak later in the project, somewhere around the middle of the activity. The chart called Construction Disbursements shows that pattern. The following chart illustrates how disbursements followed work start-ups and remained behind completions. The disbursement line follows the completion line—all expressed in percentages of totals—more closely than it does the work-begun line. This pattern suggests prudent fiscal management, since at any given moment, until the final weeks, the percentage of facilities completed was greater than the percentage of funds paid out to subcontractors.

### F. Quality Control and Data Management

DevTech’s procedures and systems allowed continual, accurate monitoring and reporting on contract progress.

Devtech Systems established timelines and procedures that enabled various quality control measures to be followed during the course of project implementation. These are discussed in order of their creation or actual use.

#### *The Performance Monitoring Plan and the Work Plan*

DevTech’s PMP for the Jamaica activity adhered to norms established by USAID and laid out intermediate results, indicators, and means of verification for the Project. Referred to in the Mid-Term Evaluation Report, the PMP is a model of clarity and usefulness. The mid-term evaluation followed the PMP and kept a clear focus on measurable results. A performance monitoring questionnaire developed during the evaluation also followed the basic structure of the PMP.

The Work Plan, written in the start-up phase of the Project, provided timelines for beginning and completing the numerous tasks required to achieve the intermediate results and the project purpose. Together with the PMP, the Work Plan offered project management a roadmap for staying the course and for assessing timeliness of activities. Both documents were integral to overall quality control during the full course of implementation.

### *The Mid-Term Evaluation*

Conducted when construction had commenced at a majority of sites and when a few facilities had been completed and disbursements were underway, the timing of the study was ideal. The evaluation report confirmed that intermediate results under the first task area had been successfully completed and that progress was advancing in each of the construction task areas. The single weakness the report identified lay in the collection and organization of basic project data. DevTech responded immediately to this observation by creating three mechanisms to address the shortcoming. Discussed below, they are: the Performance Monitoring Questionnaire (PMQ); the Satisfaction Monitoring Questionnaire (SMQ); and the Project Database. The most significant aspect of the evaluation is that it served as a practical instrument for quality control.

#### *The Performance Monitoring Questionnaire (PMQ)*

Developed and trialed during the evaluation process, the PMQ was a one-page form that recorded information on each site, status of repairs, dates begun, and beneficiaries. Project engineers, during their inspection visits, would complete the form with input from the school principals, health clinic directors, and other responsible parties at each site. Initially the data was entered into a simple database in spreadsheet format. The result was consolidation of essential information in a single electronic space that could easily be accessed and reviewed by the engineers and project managers.

#### *The Satisfaction Monitoring Questionnaire (SMQ)*

The SMQ had not been foreseen during the mid-term evaluation; it was a quick response to a sudden need that occurred almost immediately following that exercise, when two complaints about the quality of work went from the directors of facilities to their correspondent ministries. Understanding that the most effective way to preclude repetition of such complaints would be to address them at the source, DevTech again responded immediately with a public relations effort using local media and developed an instrument to gauge client satisfaction through brief interviews at each facility. This instrument, the SMQ, asked questions about respondents' perceptions of the subcontractors and of the quality and timeliness of repairs. A revision of the instrument asked, at the end of the work, if the respondents believed their facilities had been fully restored to pre-hurricane conditions.<sup>7</sup>

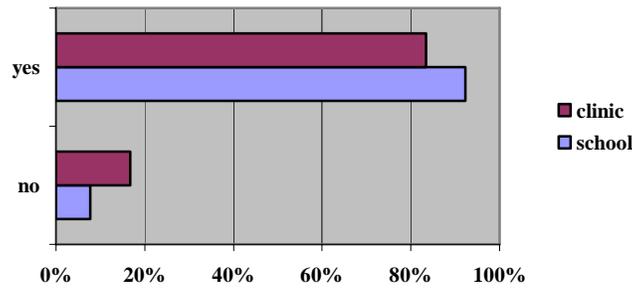
The DevTech team collected one hundred percent of SMQs. A total of 82 respondents out of 95—representing over 86 percent—affirmed that the facilities they represented were restored to pre-hurricane condition. Given the multiplicity of reasons for withholding that affirmation, 86 percent represents a highly acceptable level of positive response.<sup>8</sup> As the chart shows, there was some difference between responses from schools and those from clinics:

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<sup>7</sup> This question was not intended for certification purposes; it was a nontechnical, unofficial statement of personal opinion from respondents.

<sup>8</sup> Unfortunately, the data collectors did not record respondents' reasons. Some nonresponses almost certainly were motivated by diffidence before what appeared a technical issue, others by unsatisfied demands that exceeded the scope of the project. Furthermore, as the internally modified questionnaire erroneously made the answer to the question a single checkbox, some nonresponses may have signified doubt rather than disagreement.

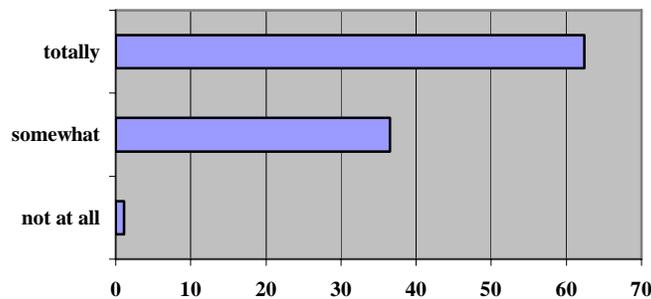
**Facility Restored to Pre-Hurricane Condition**



Since the number of NGOs is only three, the chart does not include them. Their responses were all positive.

The response to the question regarding overall satisfaction with repairs allowed for one of three possible answers: totally satisfied, partially satisfied, and not at all satisfied. Of the 95 respondents, one was completely dissatisfied, while 58 were totally satisfied.<sup>9</sup> Dissatisfaction, in this case, was due to the client’s unrealistic expectation that repairs should be made not only to damage caused by Hurricane Ivan, but also to general disrepair unrelated to the hurricane.

**Overall Satisfaction with Repairs (%)**



### *The Project Database*

The final and most monumental instrument for quality control that DevTech established for the Project is a database built on a Microsoft Access platform. The database comprises related tables on facilities, subcontractors, contract packages, payments, assessments, satisfaction responses, and links to external files. From the database one can view almost any information on project

<sup>9</sup> The actual data show that six of the thirteen respondents who did not indicate that their facilities were restored to pre-hurricane conditions nonetheless responded that they were totally satisfied with the repairs. This unlikely combination of responses suggests that the modification to the original SMQ created a final question—that referring to full restoration—that was not entirely clear to respondents.

progress and achievements, or one can print reports with cross-tabulations. Too comprehensive to describe in detail in this report, one can affirm that in the Project Database DevTech created a model for future construction or reconstruction projects in any region, a model that will allow real-time reporting to USAID on disbursements, achievement of targets and indicators, data on grantees or subcontractors, client satisfaction, and a host of other related possibilities. A graphic depiction of the database structure is available in the annexes.

#### **IV. LESSONS LEARNED**

The nature, scope, and pace of the project led to a number of lessons learned. The following section was taken from a debriefing at the USAID Mission in Jamaica in May, 2005, at the completion of the project. USAID/Jamaica posed a number of questions to DevTech's management team regarding preparedness, procedures, and implementation, and ended the session by posing the question of how DevTech would design and implement a similar project if another hurricane hit Jamaica.

##### **A. Preparedness**

Q: What can we learn from this program that will assist in improving disaster response capabilities in future hurricanes or tropical storms?

A: By mid-November 2004, most damage had already been repaired, even if in an ad-hoc fashion. This was done in most cases by the communities themselves, especially in the case of schools. Instances of schools or clinics being closed solely because of damage by Ivan were extremely rare – none were ever reported in our assessments.

USAID does not have the capacity to respond immediately in the case of hurricanes. To mitigate this, possible solutions would be to:

Provide support to the communities by direct grants. As noted above, many of the repairs were completed by the communities even before the project started. Unfortunately, in some sense the most pro-active communities were the ones to lose out, as they were not reimbursed for repairs they had completed themselves. Those who waited for USAID to get a project in place and begin work were "rewarded" by having their schools and clinics repaired, while those who showed initiative by responding quickly with their own resources were not reimbursed. Accountability seemed to be an issue, because very few receipts were obtained and/or kept, and volunteer labor of the community was not recorded. ONR considered trying to reimburse the communities, but in the end were unable to do so. In most cases, providing grants immediately to the communities would encourage them to act themselves and allow them to respond quickly. In order to get the grants quickly to the communities, funding to local relief agencies such as the Jamaican Red Cross and others could be considered.

Increase hurricane-resistance of buildings. This is probably the most cost-effective way of mitigating future storm damage. Simple measures such as installing hurricane straps and improving eave details are typically all that is needed. After hurricane Gilbert most public

building were already upgraded, but our assessments showed that more could be done, especially with eave details.

Improve maintenance of roofs. This issue is related to the previous point. Roofs need constant maintenance – otherwise they become loose and prone to ripping in the case of storms. Leaks begin to occur and cause damage to the underlying support beams and water damage to walls and ceilings. The ministries do not do enough on this issue – perhaps they could be funded or trained to do so.

## **B. Implementation**

Q: What did DevTech learn from the manner in which this program was implemented? Did it achieve the program goals? What changes could have been made to improve it?

A: One of the key lessons that DevTech learned from this project is that it is imperative to adapt program goals in response to the shifting needs of an emergent situation. The initial focus was simply on repairing hurricane damage. This quickly changed to improve the program effectiveness by upgrading hurricane resistance of buildings. As roof repairs began, it quickly became obvious that many roofs needed replacement, often including the support structure. This then became a sort of “Build Back Better” program that significantly increased the program cost and made it very difficult to design accurate initial Scopes of Work. The scopes of work changed as work on buildings began and additional needed repairs were identified or requested, leading to many expensive amendments to existing construction repair contracts. As the Build Back Better mindset developed, other elements were added. DevTech replaced damaged doors and windows, improved site drainage (to prevent the threat of flooding in future storms) and repaired electrical systems. Finally, painting became a big issue. Not only did the facility staff appreciate the uplifting effect of a good paint job, but paint improves durability, thus protecting the investment and contributes to hygiene – a big issue in clinics.

## **C. Additional Observations**

A number of issues and observations arose during implementation that DevTech would like the USAID Mission to be aware of. They include the following:

Staffing: In response to the project SOW, DevTech hired engineers with a strong structural background because we expected hurricane resistance to be a big factor. DevTech believed it would have to do a significant amount of structural analysis and repairs. In fact, DevTech rarely had to do this and the strongest element of the job description became the quick preparation of Scopes of Work. However, engineers are not necessarily the best persons for this. DevTech could instead have hired Quantity Surveyors (QS’s) whose specific skill is measurement and preparation of Bills of Quantities (Scopes of Work). This would have improved the accuracy of the estimates and helped with the budget tracking, although it raised the question of whether they would they have had the skill to carry out the minor design work involved in roof support structures and in supervising construction. In response to the recognized need for Quantity Surveyors, DevTech hired and quickly trained a number of Jamaican engineers to carry out the work.

Rapid Response Program: With such a short timeframe and program, did DevTech have to sacrifice quality for quantity? In the hurry to achieve the numbers, several instances occurred where more work should have been done on specific facilities. Many schools and clinics were in disrepair and in need of maintenance such that damage caused by Hurricane Ivan was made worse. It is essential, therefore, to decide from the onset what repairs will be done, and to inform the school and clinic officials and the community of what that is. Otherwise, unrealistic expectations can result that can negatively impact on perceptions and relationships between the community and USAID.

Moving Goals: Whereas the program started out doing only hurricane repairs, by the end of the program, DevTech subcontractors were doing extensive work to building, sometimes involving rebuilding of the structure. In one case – Sedge Pond Primary School – a new building was erected.

Selection of Low Bid Contractors on Principle: In the full and open bidding process for the repair/reconstruction subcontracts, DevTech was directed by USAID to avoid price gauging, etc. by selecting the lowest bidder. As one can imagine, offers consistently came in significantly lower than the Engineer's Estimate. This created a real problem for the site supervisors in enforcing quality control. In the most extreme cases, standards of the less qualified but lowest bidding contractors were barely adequate and work often had to be redone to upgrade it to some acceptable level. This contributed to time-line creep.

Materials Supply: USAID and DevTech expected that shortage of roof sheeting would be a major constraint, but in fact this never happened. ONR organized a major effort to import sheeting, and market forces also contributed to the ready supply. Thus, the readily available supply of roof sheeting did not hinder project start-up and implementation, nor did it drive up costs of materials needed to repair the facilities.

NGO Repairs: It is regrettable that time constraints allowed for only 3 of the 9 NGO candidates to be eligible for repair work; this was caused by shortage of time in the closing stages of the Assessments. These organizations do invaluable work in the poorer areas. They provide much needed skills-training programs and provide free schooling to disadvantaged children. They do much in facilitating community development, by providing a forum (and meeting place) for community discussion. In the Kingston area, the 3 projects that DevTech implemented were in areas where the residents are often marginalized and where there are major problems of crime and violence. It is comforting to think that the small projects that were completed are contributing to the empowerment of the communities by providing adequate, secure space for them to organize their community life.

#### **D. Relationships with Government of Jamaica (GOJ) and Others**

In order to rapidly start the project and carry out the work required in the short time frame, DevTech recognized the need to establish working relationships with various ministries of the GOJ. Establishing such relationships as well as procedures related to monitoring and reporting to the GOJ resulted in relatively smooth project implementation. One example of this was the Education Working group that was established by the Director of the Jamaican Office of

National Reconstruction, Mr. Danville Walker. This working group, attended by representatives from USAID, GOJ, DevTech and other international donors and contractors involved in repair and reconstruction, met weekly to discuss issues and reports on the progress of building repairs and rehabilitation.

Relationship with ONR: From the project onset, DevTech worked closely with ONR, including having them participate in DevTech's Selection Committee for subcontract awards. This established a synergy that contributed to the effectiveness of both organizations. ONR provided invaluable support to DevTech by arranging office space and providing some equipment that contributed to quick project start-up.

Relationship with the Ministry of Education: During initial meetings with this ministry they indicated that their preference was for a "hands-off" approach, especially with regards to construction standards and approvals. Nonetheless, DevTech kept the Ministry apprised of project progress and worked closely with some of the technical staff, especially with regard to the building design for the new school at Sedge Pond.

Relationship with the Ministry of Health: DevTech had some issues communicating with this ministry, which were finally resolved by establishing closer direct links with the 4 regional health agencies. In particular, the DevTech team involved regional technical officers in approving quality standards and, in some cases, had them "sign off" (approve) the repairs on buildings when the clinic director was absent.

In future, USAID may find that facilitating introductions and working relationships between the contractor and the Government of Jamaica would contribute to quick project start-up and implementation.

## **E. Recommendations for the Future**

Final Question: If DevTech were asked by USAID in the future to return to Jamaica in the aftermath of a hurricane of Ivan proportions, how would this new program be designed and implemented?

Answering this question builds on the section above where some of the lessons learned from the program were highlighted. In any rapid response program, there has to be an acceptance of a margin of error – there will never be a completely satisfactory outcome. There has to be a measure of flexibility as circumstances change during the program implementation period. Nonetheless, there must also be some process of measurement to identify the successes and failures of the program.

Step 1 – Identification of the Problem: The first step in the design of any program is to identify the nature and scale of the problem. It must be defined in clearly recognizable parameters and these must be capable of interpretation by the program implementers. Engineers, who are the persons charged with getting the program implemented, are trained in problem identification and solution design. They are uncomfortable when they are asked to identify vague concepts – the problem must be defined in real, understandable terms. Thus, from the beginning USAID must

define what is meant by “hurricane damage.” This may seem simplistic, but when one deals with roofs that are already worn out and have not been adequately maintained, then the interpretation becomes a little more complicated. Of the 46 candidate schools assessed, for example, 20 were eliminated because there was no evident hurricane-related damage. Of the 26 schools worked on, conversely, much of the repair work completed was only marginally related to damage by Ivan. As the program managers, this inconsistency is not a very comfortable feeling. DevTech knows that the 20 eliminated schools are not very happy with being eliminated from the program, even if the logic of ‘no damage seen’ is solid.

In summary, USAID should provide more solid guidance on what is expected and also provide support as contractors carry out the initial assessments. For example, USAID could have provided support and guidance to DevTech in deciding what constituted hurricane repairs, and whether roof upgrading so that hurricane-resistance of buildings is expected.

**Step 2: Design of the implementation plan:** In the rush to get the project underway assessment work was carried out on a phased basis. The assessment team went to a particular region or parish, carried out some assessments, returned to the office, prepared Scopes of Work and then contracted the work. The engineers then returned to the field to repeat the process in a different region. Though this did achieve the desired result of getting construction under way quickly, the overall result was there was a lack of overall planning and some inconsistency in the program. Until the final stages, DevTech was in the dark about exactly how many buildings could be repaired and how the budget would hold out. There was no time to review Scopes of Work for completeness and accuracy and to ensure that they were in line with the logic of the program guidelines. In a future program, this process should be changed. All assessments would be carried out first, Scopes of Work prepared and costs estimated, and a decision making session would be organized with the client (USAID) present. The goal of that meeting would be:

Clarity – that the Scopes were in line with the project framework

Equity – that all candidate schools were treated equally

Budget – that the program goals could be achieved with the money allotted.

After that process of analysis, a project timeline would be established so that repair subcontracts could be awarded to pre-qualified contractors who would be held to defined Progress Schedule Charts. This would allow for consistency across parishes/regions and facilities.

**Step 3: Issues in the Implementation of the Construction Program:** There has to be some measure of flexibility built into the program so that unforeseen problems can be dealt with. In many cases, when roof coverings were removed for repairs, the engineers found that the underlying roof structure had deteriorated because of leaks or often simply as a result of termite damage. This required a replacement of the entire support system at a significantly increased cost. Other unforeseen items included defective storm water drainage systems at the sites. In the event of heavy rains during hurricanes or tropical storms, there was often a danger, not just that the building could be flooded, but also that the structural integrity could be compromised. This meant, of course, that damaged drainage systems also had to be repaired.

**Step 4: Project Monitoring and Evaluation:** Measurable indicators are specified so that the project outcomes can be judged. For engineers, this is quite simple – a total number of buildings are identified as needing repairs and the necessary work is carried out. However, some of the project indicators are designed in more “sociological” terms – ex. numbers of children back in

school etc., number of clinic beneficiaries affected. The supervising engineers were asked to administer Satisfaction Monitoring Reports from the school administrators or clinic staff and members of the communities in order to report on administration and community satisfaction. Most of the engineers, however, resented having to administer these surveys and found it professionally unreasonable to have nurses, doctors, teachers, school administrators, and community members “judge” their work. Their job as professionals, they felt, was to ensure that the repairs were carried out to a reasonable standard and within the time and budget allotted. Monitoring and reporting on other than construction matters should probably be implemented by non-engineering staff, although this might result in additional level of effort for the project.

## **V. CONCLUSIONS**

The Hurricane Ivan Social Sector Infrastructure Repair and Reconstruction in Jamaica Project fully achieved the project goals, successfully assessing 150 facilities for eligibility and restoring 95 to pre-hurricane conditions or better. Of the facilities restored, there were 26 schools, 66 clinics, and three NGOs located in every parish in each of Jamaica’s three regions. This resulted in improved education and health facilities for over 32,000 clients served by the facilities.

Nine subcontractors, through 13 subcontracts, executed the reconstruction and repair of the facilities, at an approximate total value of \$2.3 million. DevTech was stringent in its fiscal management of the project as evidenced by the minimal (less than 2%) increase to the subcontract line of the budget despite shifting goals and work plans in order to effectively respond to the emergent nature of the situation.

DevTech managed the project with clear procedures and timelines that facilitated accurate monitoring and reporting on contract progress, and adhered to USAID norms. The Performance Monitoring Plan allowed the project to maintain a clear focus on measurable results, while the Work Plan established feasible timelines for beginning and completing tasks. Together the PMP and Work Plan served as a roadmap for keeping the project on target. The mid-term evaluation resulted in improved mechanisms for collecting and organizing project data, including the Performance Monitoring Questionnaire, the Satisfaction Monitoring Questionnaire, and the Project Database. The database, in particular, proved to be a critical tool for quality control, allowing for both in-depth analysis of progress at each site as well as cross-reference among sites.

During this project, DevTech learned that future disaster response capabilities can be improved by providing support to communities through direct grants, increasing the hurricane-resistance of buildings, and improving roof maintenance. Additionally, it is imperative that program goals be adaptable and flexible to most effectively respond to the shifting nature of the situation, and that project capabilities be clearly outlined for beneficiaries to ensure that expectations are in line with project goals. This includes involving stakeholders from the beginning, and keeping them informed of progress. An effective system for collecting data and monitoring project progress is essential in being able to achieve measurable program goals and relay the progress to stakeholders. Finally, working closely with government counterparts played a critical role in

successfully achieving program goals, by facilitating local relationships and promoting transparency and accountability.

## VI ANNEXES

### Annex 1

<b>Table 1. Facilities Repaired (sorted by date begun)</b>							
Name of Facility	Type	Parish	begun	finish ed	Dire ct	Indire ct	Cost
Jericho Primary	sch	St. Catherine	18-Jan	11-Feb	598	5000	360,500.00
Linstead Primary & JH	sch	St. Catherine	18-Jan	11-Feb	2107	48408	330,600.00
Victoria All Age	sch	St. Catherine	18-Jan	6-Apr	522	12096	1,935,065.00
Black River HC	clinic	St. Elizabeth	20-Jan	12-Mar	614	34200	115,020.00
Elderslie Rural Maternity	clinic	St. Elizabeth	20-Jan	25-Apr	230	11400	5,751,683.00
Fyffes Pen HC	clinic	St. Elizabeth	20-Jan	28-Feb	68	5000	54,024.00
Maggotty HC	clinic	St. Elizabeth	20-Jan	12-Mar	213	10000	63,500.00
New Market HC	clinic	St. Elizabeth	20-Jan	12-Mar	207	20000	138,710.00
Hazard Primary	sch	Clarendon	22-Jan	22-Mar	1050	24240	1,985,540.00
Kellits Primary	sch	Clarendon	22-Jan	8-Mar	811	18864	562,671.00
Toll Gate All Age	sch	Clarendon	22-Jan	27-Mar	545	12312	704,000.00
Crescent All Age	sch	St. Catherine	25-Jan	6-Apr	1302	30000	2,984,947.00
Tulloch Primary	sch	St. Catherine	25-Jan	6-Apr	1097	11241	2,140,555.00
Carmel All Age	sch	Westmoreland	28-Jan	21-Apr	165	3792	2,872,888.00
May Pen HC	clinic	Clarendon	2-Feb	15-Feb	1027	55000	2186090
Chapelton	clinic	Clarendon	4-Feb	28-Feb	614	30000	251,168.00
Christiana HC	clinic	Manchester	4-Feb	11-Mar	409	10000	217,740.00
Kellits HC	clinic	Clarendon	5-Feb	28-Feb	759	42750	727,186.00
Fergusson All Age	sch	Manchester	7-Feb	17-Mar	237	5424	1,125,945.00
Brinkley Primary	sch	St. Elizabeth	10-Feb	10-Mar	85	1896	148,617.00
Red Bank All Age	sch	St. Elizabeth	10-Feb	26-Mar	148	3360	1,600,620.00
Schfield All Age	sch	St. Elizabeth	10-Feb	22-Mar	121	2736	511,480.00
Royal Flat HC	clinic	Manchester	11-Feb	1-Apr	205	11400	365,687.00
Thompson Town HC	clinic	Clarendon	11-Feb	25-Apr	77	8500	2,489,043.00
Belleview HC	clinic	St. Elizabeth	14-Feb	8-Mar	276	15000	170,600.00

Braes River HC	clinic	St. Elizabeth	14-Feb	10-Mar	70	4000	222,040.00
Junction Rural Maternity	clinic	St. Elizabeth	14-Feb	4-Apr	217	11400	3179352
Malvern HC	clinic	St. Elizabeth	14-Feb	4-Apr	106	3000	1,101,255.00
Santa Cruz	clinic	St. Elizabeth	14-Feb	10-Mar	413	45000	439,405.00
Southfield HC	clinic	St. Elizabeth	14-Feb	4-Apr	767	15000	572,070.00
Mille Gulley HC	clinic	Manchester	15-Feb	1-Apr	205	3000	1,012,845.00
Albert Town	clinic	Trelawny	18-Feb	20-Apr	128	3933	187,210.00
Alexandria HC	clinic	St. Ann	18-Feb	25-Apr	1122	35000	2,138,360.00
Arcadia	clinic	St. Thomas	18-Feb	1-Apr	24	500	94,150.00
Bamboo HC	clinic	St. Ann	18-Feb	25-Apr	149	12000	801,560.00
Blackstonage	clinic	St. Ann	18-Feb	21-Apr	214	11970	783,470.00
CASE (college)	sch	Portland	18-Feb	6-May	1360	26400	10,021,385.00
Catadupa	clinic	St. James	18-Feb	1-Apr	138	7695	491,671.00
Cedar Valley	clinic	St. Thomas	18-Feb	15-Apr	36	1995	900,935.00
Enfield HC	clinic	St. Mary	18-Feb	1-Apr	77	2635	2,774,595.00
Falmouth	clinic	Trelawny	18-Feb	25-Apr	532	8169	467,448.00
Garlands	clinic	St. James	18-Feb	25-Apr	91	400	149,372.00
Isaac Barrant	clinic	St. Thomas	18-Feb	25-Apr	230	20000	1,837,420.00
Jackstown Staff	clinic	Trelawny	18-Feb	25-Apr	102	2211	300,671.00
John's Hall	clinic	St. James	18-Feb	1-Apr	205	11400	36,652.00
Lowe River	clinic	Trelawny	18-Feb	4-Apr	92	1500	200,431.00
Mt Carey	clinic	St. James	18-Feb	28-Apr	133	7410	491,196.00
Nonsuch	clinic	Portland	18-Feb	20-Apr	36	3100	1,459,765.00
Old Harbour	clinic	St. Catherine	18-Feb	25-Apr	432	36000	340,000.00
Roehampton	clinic	St. James	18-Feb	27-Apr	256	14250	452,069.00
Rowlands Field	clinic	St. Thomas	18-Feb	15-Apr	22	700	713,890.00
Seaforth HC	clinic	St. Thomas	18-Feb	25-Apr	219	8000	1,900,790.00
Trinityville	clinic	St. Thomas	18-Feb	25-Apr	72	4885	576,000.00
Type Five	clinic	St. James	18-Feb	28-Apr	87	4845	121,160.00
Ulster Spring	clinic	Trelawny	18-Feb	25-Apr	138	996	153,419.00
Warsop	clinic	Trelawny	18-Feb	29-	72	2000	928,483.00

				Apr			
Yallahs HC	clinic	St. Thomas	18-Feb	1-Apr	532	29640	198,470.00
Glengoffe	clinic	St. Catherine	22-Feb	4-May	207	12000	671,900.00
Guys Hill	clinic	St. Catherine	22-Feb	30-Apr	767	42750	617,440.00
Harkers Hall	clinic	St. Catherine	22-Feb	29-Apr	208	16000	1,018,500.00
Lioneltown HC	clinic	Clarendon	22-Feb	5-May	532	29640	4,804,642.00
Long Road All Age	sch	St. Mary	22-Feb	22-Mar	98	1500	3,317,215.00
Race Course HC	clinic	Clarendon	22-Feb	5-May	102	8000	402,232.00
St. Jago Park	clinic	St. Catherine	22-Feb	4-May	1228	25000	349,050.00
Trinity Primary	sch	St. Mary	22-Feb	21-Apr	339	7776	245,650.00
Troja	clinic	St. Catherine	22-Feb	21-Apr	512	4000	616,560.00
York Town HC	clinic	Clarendon	22-Feb	15-Apr	102	5700	2,048,900.00
St. Marys All Age	sch	St. Elizabeth	24-Feb	4-Apr	205	4704	1,490,722.00
Belfield HC	clinic	St. Mary	26-Feb	6-May	102	2400	843,487.00
Castleton HC	clinic	St. Mary	26-Feb	6-May	102	4033	769,998.00
Steertown	clinic	St. Ann	26-Feb	25-Apr	287	15960	743,530.00
Cascade	clinic	Hanover	3-Mar	25-Apr	205	5000	844,284.00
Cave Valley	clinic	Hanover	3-Mar	25-Apr	205	5000	1,445,080.00
Darliston	clinic	Westmoreland	3-Mar	25-Apr	113	6270	2,494,050.00
Grange/Kendel	clinic	Hanover	3-Mar	25-Apr	205	8500	1,001,780.00
Green Island	clinic	Hanover	3-Mar	25-Apr	123	10000	803,910.00
Little London	clinic	Westmoreland	3-Mar	25-Apr	215	11970	175,390.00
Logwood	clinic	Hanover	3-Mar	25-Apr	123	6500	423,200.00
Negril	clinic	Westmoreland	3-Mar	25-Apr	123	6840	1,627,732.00
Petersfield	clinic	Westmoreland	3-Mar	25-Apr	123	6840	1,365,380.00
Sandy Bay	clinic	Hanover	3-Mar	25-Apr	215	11970	2,920,500.00
Wait-a-Bit Phase 2	clinic	Trelawny	3-Mar	25-Apr	0		5,469,748.00
Williamsfield	clinic	Westmoreland	3-Mar	25-Apr	102	5700	798,640.00

Barbary Hall All Age	sch	St. Elizabeth	8-Mar	26-Mar	120	2760	579,000.00
Hillside Primary	sch	St. Thomas	8-Mar	25-Apr	60	1320	256,914.00
Norman Garden Primary	sch	Kingston	8-Mar	25-Apr	929	21120	3,484,274.00
Sedgepond	sch	Clarendon	8-Mar	8-May	31	3500	6,969,054.00
Fyffes Pen Primary	sch	St. Elizabeth	15-Mar	28-Apr	183	4056	161,960.00
Goodwill	sch	St. James	15-Mar	28-Apr	218	4968	516,924.00
Mount Airy All Age	sch	Westmoreland	15-Mar	25-Apr	572	13272	620,640.00
St. Patrick's Institute	NGO	Kingston	15-Mar	5-May	244	5000	587,760.00
Coffals Basic	sch	Clarendon	17-Mar	4-Apr	82	4000	15,840.00
Mel Nathan Institute	NGO	Kingston	28-Mar	5-May	162	10000	1,692,632.00
YWCA	NGO	Kingston	11-Apr	5-May	1419	20000	1,228,841.00
Fort George Primary	sch	St. Ann	21-Apr	30-Apr	151	5000	46,520.00

## Annex 2

<b>Table 2: Subcontracts (in approximate US\$)</b>				
Subcontractor	Date Signed	Work Began	Work Finsihed	Total Cost
Island Woods & Development Ltd.	17-Jan-05	17-Jan-05	14-Apr-05	\$164,787
Lascar Fencing	19-Jan-05	19-Jan-05	25-Apr-05	\$105,191
Lascar Fencing	28-Jan-05	28-Jan-05	25-Apr-05	\$147,473
W.A. Reid Construction	31-Jan-05	31-Jan-05	25-Apr-05	\$85,431
Centrac Limited	05-Feb-05	01-Feb-05	05-Apr-05	\$167,871
Alfasure Structures and Roofing Ltd	14-Feb-05	07-Feb-05	04-May-05	\$164,285
Modern Waterproofing	14-Feb-05	07-Feb-05	28-Apr-05	\$130,899
Sealand Electrical & Services Co Ltd.	23-Feb-05	23-Feb-05	30-Apr-05	\$107,208
Bajad Ltd.	16-Feb-05	10-Feb-05	25-Apr-05	\$170,944
Joint Board of Teacher Education	15-Feb-05			\$288,243
Sealand Electrical & Services Co Ltd.	21-Feb-05	21-Feb-05	09-May-05	\$230,139
Bajad Ltd.	23-Feb-05	23-Feb-05	09-May-05	\$209,846
Bajad Ltd.	02-Mar-05	23-Feb-05	25-Apr-05	\$329,725