An Interactive Qualifying Project Report

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IMPROVING THE PROCESS FOR EVALUATING THE INFRASTRUCTURE IN LAS COMUNIDADES ESPEICALES

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This report is the product of an education program, and is intended to serve as partial documentation for the evaluation of academic achievement. The report should not be construed as a working document by the reader.

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Abstract

This project, prepared for CSA Group of Architects and Engineers, presents the details for a standardized evaluation process for Special Communities. Through interviews with officials at the Special Communities Office and Department of Transportation and Public Works, CSA Group field architects and engineers, CSA Project Managers, and GIS experts we assessed the original evaluation process. The data from these interviews was collected and analyzed, resulting in the creation of a new standardized evaluation process which includes a new physical infrastructure assessment form. Both the evaluation process and form are to be used in the next two phases of the Special Communities Initiative.

Table of Contents

Table of Figures

Table of Maps

Table of Photos

1.0 Introduction

Community redevelopment is the process of rebuilding communities that have deteriorated over time. Deterioration occurs not only to the housing and the physical infrastructure in a community but also to the social and economic aspects of the community as well. The physical infrastructure of the community can easily be rebuilt with the proper funding. However, in order reestablish and sustain the social and economic aspects, the community residents must take an active roll in the redevelopment process. Without the empowerment of the community members the redevelopment project will fail and again the community will fall back into a deteriorated state.

The Special Communities Initiative on the Island of Puerto Rico is a redevelopment project funded by the central government that addresses the needs of nearly 700 communities with over one billion dollars of funding. The Initiative focuses not only on physical infrastructure and housing, but also the social problems that plague these communities, such as unemployment and education. This program has already assisted several communities with both physical improvements such as community center construction and social improvements such as leadership courses for community representatives. These improvements are being carried out by government agencies and several private companies.

Custodio, Suarez and Associates of Architects and Engineers, CSA Group, is a consulting firm located in San Juan, Puerto Rico and they are currently working with the Puerto Rican government to assess the physical needs of communities involved in the Special Communities Initiative. The assessment occurs when CSA field team architects and engineers go into a Special Community and complete an evaluation of the community's infrastructure. CSA Group's evaluation process then produces a technical report of the physical infrastructure in each community, while government agencies are responsible for the social redevelopment aspects of the program.

Previously, CSA lacked a standardized assessment process for the evaluation of community infrastructure, even though 18 communities had already been evaluated. CSA wanted to have a standardized process for evaluating communities that satisfied the needs of their client, the Department of Transportation and Public Works (DTOP), fits the skills of the evaluators, and was within previously established time and budget constraints for each assessment.

The purpose of this project was to create an evaluation process that incorporates more accurate data collection methods. This project was important to our sponsor and the Special Communities being evaluated because these evaluations helped to determine what infrastructure improvements are made in each Special Community. This project was also important for the Special Communities of Puerto Rico because each assessment produced a final report of the community's physical condition and became a historical document that would remain on record at the DTOP. With a standardized process we ensured that the proper information about these Special Communities was represented in the final reports so that the DTOP could address both the short-term improvements targeted by this initiative and plan for long term improvements that could be addressed by other government projects in the future.

2.0 Background and Literature Review

2.1 Introduction

Community redevelopment in its most basic form focuses on improvements to the infrastructure of a community such as repair or construction of housing, and the improvement or building of public facilities (The World Group Bank, 2001). Redevelopment also addresses the social aspects of a community such as unemployment, school dropout rates, and poverty rates. For this project, the redevelopment of physical infrastructure was the main area of focus.

The Cantera Project is a relatively recent and well-known example of a massive community redevelopment project started in the early 1990s and continuing today in Puerto Rico. The project includes not only improvements to housing and physical infrastructure but also to the social and economic aspects of the community. One of the social and economic projects includes leadership seminars that are designed to build social and economic skills of the local residents to make them a more viable part of society.

This success of the Cantera Project has led to an Island-wide community redevelopment project known as the Special Communities Initiative. The current governor of Puerto Rico, Sila Calderón, created the Special Communities Initiative Fund in 2001 with an initial investment of one billion dollars to help 686 communities across Puerto Rico. Five hundred and sixty million dollars of the fund has been set aside specifically for 20,000 housing structures while the rest of the one billion dollars will fund the development of the social, economic, and physical infrastructures of the communities.

One of the government agencies working on the Special Communities Initiative is the Department of Transportation and Public Works (DTOP). The DTOP is managing the redevelopment of the physical infrastructure of Special Communities. The private consulting firm, CSA Group of Architects and Engineers, along with other private firms, has been contracted by the DTOP to complete assessments of the physical infrastructure in each of the 686 Special Communities in order properly allocate funding to each community.

2.2 Identifying Communities in Need

As modern cities expand, government funding is typically given to thriving communities that are stable and growing physically, economically, and socially. Communities that do not follow these trends are often overlooked by the government, causing further poverty and the deterioration of physical structures. Such communities have traditionally been abandoned because their lack of physical, social, and economic infrastructures (Harvey, 1996).

High poverty rates and low incomes rates are two indicators used to identify communities that are in need of funding for redevelopment. Deteriorating or vacant housing is another indicator of a declining community because housing conditions in a community are closely linked to the economic success of the community (Ahlbrandt, 1975). The lack of adequate household income results in residencies spending a larger percentage of their earnings on housing. As a result of this, households are forced to choose low quality housing in poor neighborhoods. Often this low quality housing will

continue to deteriorate rapidly since lower incomes significantly limit how households maintain their property (Ahlbrandt, 1975). Therefore, the repair of existing housing or the construction of new housing is an essential and usually primary part of a successful community redevelopment plan. Although housing is an important indicator of the deterioration of a community, the geographical area may be the leading factor to its decline.

2.2.1 Geographical Area

The geographical position of a community can change over time such that it is no longer in an advantageous location. As cities grow and expand, communities cannot physically relocate, and because of social and economic factors their location may become undesirable. As a result geography can play a role in a community's decline, making it no longer a source for jobs or a source for stores and services that support daily needs. Furthermore, transportation may no longer be available to that area, the physical quality of schools may deteriorate, and the quality and range of public and private services provided may decrease as well.

The living conditions that determine the quality of life and the direction of change for the community are extremely important factors that hold and attract residents to a specific community (Ahlbrandt, 1975). Without that draw to a community, the value of property decreases which will lead to the eventual deterioration of housing and physical infrastructure as well as the overall decline of the community. Inner city communities typically represent the cheapest housing accommodations and these locations usually receive lower prioritization by governments causing further deterioration. Residents in these communities have low incomes that make it impossible to restore the physical infrastructure and housing of the community, leading to their continued decay.

Historically, as a city expands its inner communities are the ones that become the most deteriorated. In most cases, people of middle-income move to the outskirts or the fringe of the city, while people of lower-incomes remain in these inner communities.

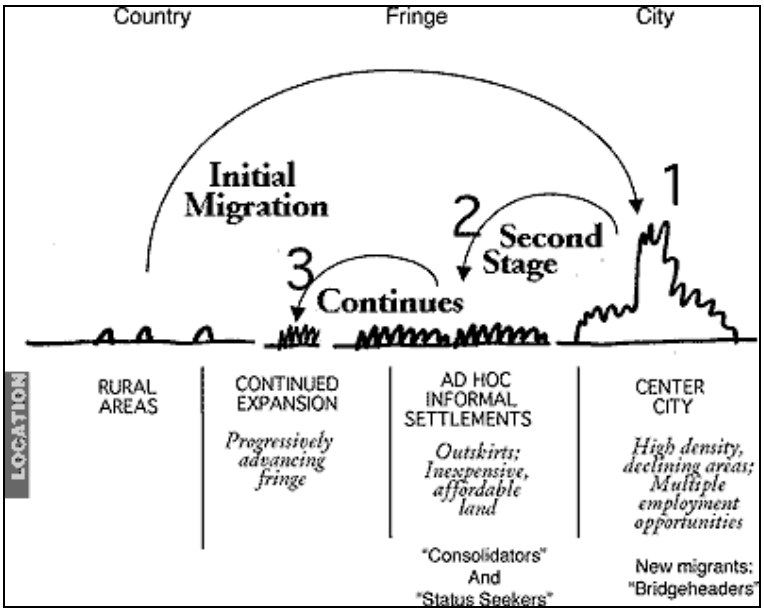


Figure 1: Movement of Residents (The World Bank Group, 2001)

Figure 1 illustrates the continual movement of residents of higher income out of the city to communities where there is more stable and secure housing along with a non-deteriorated physical infrastructure.

2.2.2 Infrastructure

The infrastructure of a community is the physical thread that holds it together. Therefore it is important that a definition of infrastructure be clearly defined. Many people believe that the physical infrastructure of a community is only its public works and utilities, however physical infrastructure involves much more (Ausubel and Herman, 1988). Ausubel and Herman (1988) define infrastructure as the following:

- Water System
- Sanitary Sewer
- Energy System
- Telephone System
- Roads/Bridges/Sidewalks
- Storm water
- Solid Waste
- Parks
- Recreational Areas
- Transportation
- Public Facilities (Police, Firemen, etc.)
- Schools
- Community Facilities (Community Centers, Libraries, etc.)

Infrastructure provides the vital pieces that make a community successful and the list above shows how infrastructure plays an important part in people's everyday life. In particular, infrastructure provides the basic needs of residents including safety, communication, sanitation, economic development, housing and transportation.

As important as infrastructure is to the lives of the people, in many cases it deteriorates more rapidly than it can be replaced and restored, thus becoming an enormous maintenance problem in many areas of the world. This is especially true in the United States which suffers from a high volume of infrastructure decay (Ausubel and Herman, 1988). With the rapid expansion of cities and towns, many older infrastructure systems that are in need of repair or replacement are being overlooked. This situation is reflected in the state of infrastructure deterioration in many communities in Puerto Rico.

2.2.3 Objectives of Redevelopment

Community Redevelopment has been successful in many third world countries as well as the industrialized nations of the world. Redevelopment of impoverished communities in particular has been an effective manner of providing shelter and a clean and safe environment (The World Bank Group, 2001). Redevelopment creates new housing and can stimulate the local economy. It upgrades roads, sidewalks, bridges, the sanitation of water and its distribution, the removal of sewage, and any many other facets of the infrastructure of a community. By redeveloping a community, the hope is that it will improve the physical conditions of the community while creating a greater sense of

community confidence and self-worth. Unfortunately, community redevelopment is not free and comes at a high price.

2.2.4 Costs of Redevelopment

Redevelopment is often extremely expensive. To mitigate cost some community residents have provided free labor, thus lowering the costs to organizations that initiated the redevelopment effort. Fortunately, since most redevelopment programs only consist of repairs to physical structures they are not overly labor-intensive. Construction projects such as improvement to housing, public facilities, and infrastructure are costly endeavors. Governments therefore typically set aside billion dollars programs for community redevelopment. An example is the Department of Housing and Urban Development (HUD) in the United States, which in 2002 set aside $22 billion dollars for the Renewal Communities Initiative. Through this program HUD identifies communities in need and then uses the money to create or repair housing, infrastructure, community programs and facilities, education, and jobs (Department of Housing and Urban Development, 2002). Many other governments around the world have created similar funds in order to combat poverty and the deteriorating conditions in their cities. However, no matter how much money is provided to a community, without the resident's involvement, the redevelopment project will fail.

2.2.5 Community Involvement

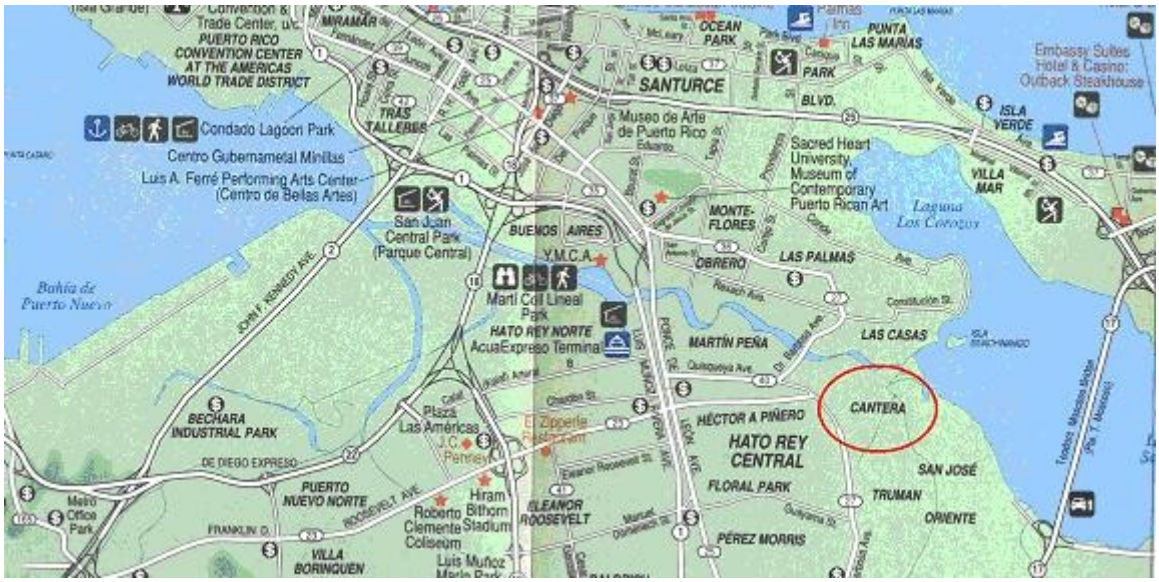
Businesses, governments and non-profit organizations often all provide funding and support for community redevelopment. For an institution to make a decision on the type of support needed to revitalize a community they must focus on the residents of a community, look at the community's needs, determine what they have for resources and then complete the redevelopment project (Lansberry, 1995).

Cleary, an important aspect within community redevelopment is the community residents' involvement and participation in the program. If a community is to sustain redevelopment efforts, then the redevelopment organizations must listen to the residents of the community because the residents are most likely aware of the major community problems and have an opinion of what improvements should be made. This community input will then help the redevelopment authorities with their decisions on what areas need improvement and what would be the most beneficial to the residents. As a result, regardless of the particular target for redevelopment, the redevelopment program must be flexible and the designs must be able to conform to the social conditions and vocalized needs of the community residents (The World Bank Group, 2001). A prime example of how a community's involvement led to a successful redevelopment project is in the community of Cantera in Puerto Rico.

2.3 Redevelopment in Puerto Rico: The case of Cantera

The Cantera Peninsula is a community of about 12,000 residents located in the central area of San Juan (refer to Map 1). Cantera is one of San Juan's poorest communities and has roots that date back to the 1930s. In the late 1940s the Puerto Rican Government began to industrialize its economy, which led to a migration of people from Puerto Rico's rural areas to its urban areas. Since these people lacked financial resources and did not receive assistance from the government it forced them to take up residence on any land

they could find. In the Cantera region, where many settled, this land was severely undeveloped and consisted mainly of marshlands and mangrove forests.



Map 1: Map of the Cantera Peninsula

When the community of Cantera was settling, the Rexach Corporation operated a quarry in the Cantera area which gave some of the settlers a source of income and some economic stability. In fact, the name Cantera means "quarry" in Spanish, which is where the original name of the Peninsula comes from.

Due to extreme poverty, homes were constructed with any available building materials including cardboard, cloth sacks, scraps of wood and zinc, mangrove branches and trunks, and even aluminum cracker cans (Neighborhood Council of the Cantera Peninsula). With the absence of zoning laws or city planning, houses were constructed in any spot available, leaving little or no room for streets to be constructed.

With so many Cantera residents living in a small densely populated area, there were large amounts of waste that needed to be disposed of. Unfortunately, there were no sewage lines or any form of trash collection since the streets were not wide enough to handle garbage trucks. As a result, the residents dumped most of their trash into the Martín Peña Canal, shrinking the size of the canal to just a meter wide in some areas (McPhaul, 2002).

In response to the deteriorating housing and sanitary conditions of Cantera, the government developed an initiative that in the 1960s provided the residents with potable water services, electricity and sewage lines. In addition to the physical improvements of Cantera, the government also implemented plans which improved education, transportation and health services throughout the community (Neighborhood Council of the Cantera Peninsula). Unfortunately, even after assistance from the government over a period of many years, Cantera was still extremely poor and in need of a well planed redevelopment project.

2.3.1 La Cantera's Neighborhood Council

After the damaging effects of Hurricane Hugo in 1989, conditions in Cantera went from bad to worse. That is when Sila María Calderón, mayor of San Juan entered the picture. Her first initiative as mayor of San Juan was to create a community redevelopment strategy for Cantera.

With the financial support of the government and private sponsors from throughout the city, the Cantera Neighborhood Council was created. The Council studied the needs and problems that faced the community, and developed certain projects that would be beneficial to the community. The first phase of the plan called for the lobbying and approval of Law 20. This law was passed by the Puerto Rican legislature in 1992 and created the Cantera Peninsula Integral Development Company (Neighborhood Council of the Cantera Peninsula).

The next phase began with the education of the community members. The leaders of the program and residents from the community spent one day a week for an entire year in training courses giving them the skills needed to manage and sustain the project. Local leaders were involved with the Neighborhood Council since its inception (McPhaul, 2002) and in 1994 the initial physical improvement began.

For the first time families received property titles for land that they had occupied for years. This provided a sense of security and instilled pride in many of the residents. Other residents were relocated to some of the new housing projects that were being built in the area. Not only were residents relocated to new housing developments, they were often hired as laborers to assist contractors in the construction of the neighborhood housing projects. Consequently, they were obtaining the construction skills required to build the housing, which gave many of the residents, in the short term a source of income, and in the long-term, marketable trade skills.

2.3.2 Present Day Cantera

Currently, the Cantera Peninsula is still undergoing redevelopment. In January of 2002, 292 public housing units were ready to be occupied by families that needed to be relocated to safe, clean and affordable housing and by 2004 a total of 502 housing units will be constructed (Neighborhood Council of the Cantera Peninsula). Photo 1 shows an example of what some of these new housing facilities look like. Shown in Photo 2 is a brand new community center that was constructed to give the community of Cantera a place to assemble, work, and play.

Photo 1: New Housing Units

Photo 2: Cantera Community Center

Also underway are several improvements to the canal and watershed surrounding Cantera including: the dredging of the Martin Peña Canal, the decontamination the lagoon that borders the Cantera community, rehabilitation of the San Juan Bay estuary system, and integration of the canal and the collective transportation system of the metropolitan area (Puerto Rico Herald, 2002). Due to the success of the Cantera redevelopment project, when Sila Calderón became governor in the year 2000 she decided to try and duplicate the project but on a much larger scale. She called this massive redevelopment project, the Special Communities Initiative.

2.4 Special Communities Initiative

Governor Calderón introduced the Special Communities Initiative in 2001. It was a program designed to help rebuild the most impoverished communities throughout Puerto Rico. Nearly 700 communities have been identified as candidates for the Special Communities Initiative. The communities selected to participate in the Initiative were selected by the following criteria:

- High dropout rate of children between 6 and 18 years of age.
- High rate of illiteracy.
- High proportion of people living under the level of poverty established by the federal government.
- Families where a single head of household is only source of income.
- High rate of unemployment.
- Historical length of environmental problems.
- Absence or deficiency of the basic public services.
- Few labor skills of the residents.
- Total or partial absence of infrastructure and basic services, such as; system of electrical energy, aqueduct and sewage system, paved streets and sidewalks, schools, areas of recreation, telephone, and post office.
- Environmental conditions of possible danger such as landslides and floods.
- Deterioration of houses and overcrowding of families.
- Absence of property titles.
- Problems of security. (Calderón, August 19, 2002)

Photo 3: Squatter House in Villa Quintero

Photo 4: Unpaved Road in Villa Quintero

Photos 3 and 4 are representative of a Special Community in need of infrastructure improvements and are of the community, Villa Quintero, from the municipality Toa Baja. This community meets the criteria that addresses the physical problems in the following ways; absence or deficiency of the basic public services, total or partial absence of infrastructure, deterioration of housing and overcrowding of families, and absence of property titles. Based on these criteria, 686 communities throughout Puerto Rico (Appendix A) have qualified for the Special Communities funding. In order for each of these communities to be successful like the Cantera Project there were many goals established before the Initiative was created.

2.4.1 Goals of the Initiative

The general goals of the Special Communities Initiative are as follows:

- To implant a model of social action that stimulates the fortification of the organizational and economic base of the Special Communities so that these assume the direction of their own process of development.
- To coordinate the efforts of the governmental and municipal agencies to promote the social and economic development of the Special Communities.
- To promote the participation of the private sector and the foundations and institutions of the civil society so that they contribute to improve the quality of life of the residents of the Special Communities.
- To establish a Puerto Rican Coalition against the Poverty. (Departamento de Transportación y Obras Públicas, 2001)

These are only the general goals of the Initiative; the goal of each community is to become empowered. In order for a community to become empowered they must complete five stages of development. The five stages are as follows:

- **Insertion of the Community**
  - During this stage the community is identified as a Special Community by the criteria. The government liaison, Promoter, visits the community and identifies the community leaders. The promoter uses this time to learn as much information about the community as possible.
- **Knowing the Community**
  - This stage consists of the promoter getting to know the residents of the community and vice versa. The promoter begins to motivate the residents to get involved in the making of decisions about their community. The promoter also calls several community assemblies to begin to organize the community and identify physical infrastructure and social problems.
- **Organization of the Community**
  - This is the stage where the community becomes organized. The promoter provides as much support to the community leaders but he does not do the organizing himself. It is the community's responsibility to become organized.
- **Community Sustainability and Self-reliance**
  - Once the community is organized this stage can occur. It is in this stage that the community becomes sustainable on their own. The residents of

the community make all the decisions about their community regarding infrastructure, social, and economic improvements. The community establishes all community development projects.

- **Creating Alliances**
    - This is the final stage in this process in which the community looks to establish itself within the political, social, and economic fabric of society by creating ties with other communities and municipalities.

2.4.2 Money Distribution of the Special Communities Initiative Fund

The redevelopment of a single community is not an easy task, let alone 686 communities. Therefore in order to fund the Initiative, Governor Calderón has created a one billion dollar trust. Since housing is such an important part of this project $560 million dollars has been designated for the improvement or construction of adequate housing facilities in 200 communities. These 200 communities have been labeled as some of the poorest communities on the Island and are in the most need of help. As a result of this, these poor communities will also receive $130 million dollars towards new facilities and infrastructure redevelopment. This averages to almost $4.9 million dollars spent in each of these communities. The remaining $310 million dollars will be used for the other 486 communities at a rate of around $500,000 per community for redevelopment in any area that the field assessment engineers see fit. One of the government agencies in charge of distributing this money to the Special Communities is the Department of Transportation and Public Works.

2.4.3 Department of Transportation and Public Works (DTOP)

There are many different government agencies involved with the Special Communities Initiative and the different infrastructure, housing, and social projects. The Departamento de Transportación y Obras Públicas (DTOP) is the Department of Transportation and Public Works in Puerto Rico and is primarily focused on the redevelopment of infrastructure, landscaping, open recreational areas, and community facilities required in the Special Communities. The plan of the DTOP is to:

- Establish the new "Directoría de Communitarian Desarrollo" (Community Development Directorate), that will include regional coordinators to evaluate the necessities of the special communities and to inspect the projects
- Evaluate 2,000 projects to be developed in more than 400 special communities
- Invest $8.7 million dollars in fiscal year 2003, for infrastructure development in 60 Special Communities (Departamento de Transportación y Obras Públicas, 2001)

The DTOP completed a few projects near the end of fiscal year 2002 that were beneficial to several communities. An example of a project undertaken recently by the DTOP was the construction of a bridge in the community of Luquillo, which benefited the 237 families that live there. Another example was in a community known as Rushes, where the DTOP built safety barriers for the benefit of the community's 507 families. Sidewalks and streets were also being repaired or constructed throughout various communities (Departamento de Transportación y Obras Públicas, 2001). In order to make these improvements the DTOP had to first learn of the problems within the

community. Therefore they contracted out several private companies to complete infrastructure assessments, such as CSA Group of Architects and Engineers.

2.5 Community Evaluation Process

The CSA Group of Architects and Engineers is a consulting firm working with the Special Communities Office and the DTOP. Under contract to the DTOP, CSA has the responsibility for assessing communities' physical infrastructure. Based on these assessments, the DTOP then decides how to allocate funding to communities for infrastructure redevelopment. CSA's contract of evaluating Special Communities was broken up into three phases with the initial phase completed in early 2003.

During the initial phase of the project CSA did not follow a set procedure for assessing communities but most assessments included interviews with community leaders, evaluation of the community by field team architects and engineers, and a written proposal to the DTOP based on the findings of the field team during their assessment of the community.

Interestingly, the field team that evaluated communities did not use the initial CSA assessment form created for the assessment project to gather data. Rather, they used their own techniques and forms. The reason for this was that the original form was created for the assessment of water conditions and CSA felt that it could be adapted and used for the evaluation of Special Communities. However, the form proved to be inadequate in many different ways.

Originally the form was going to be used in conjunction with a database so that the information gathered during the evaluation could be properly organized and stored. However, the first time the assessment form was used with the database, both were found to be inefficient and difficult to use because they were not set up properly and the assessment form was too general. Since the evaluation of the first 18 communities took place simultaneously, there was no time to revise the evaluation methodology or create a new standardized form. Therefore, individual field team engineers created their own assessment forms during the evaluation of these initial 18 communities.

In the beginning of the year 2003 the initial 18 communities were evaluated in a span of two weeks. The evaluation process began when CSA Project Managers went into a community and interviewed the mayor and/or community leaders. During this meeting the Project Managers learned what community leaders perceived as the problem areas of the community and what improvements were needed. The Project Manager relayed this information to the field team engineers and architects who then went into the community to complete the assessment.

The communities were evaluated by three different groups of field team engineers and architects. The groups consisted of one engineer and one architect. Each group had one day to evaluate the physical infrastructure of the community and then spent the following days writing a preliminary report. The preliminary report was given to the Project Manager, who then wrote the final draft of the report and gave it to the DTOP. In the report, CSA made recommendations that were most beneficial to the community based on their assessment of that community. The DTOP took the report and selected the most feasible projects. Then with CSA, the DTOP presented the report and recommendations to the residents of the community. The community voted on what

improvements they wanted and then the DTOP contracted the redevelopment jobs out to private companies.

2.6 Summary

In order for a community to go through redevelopment it must be first identified as in need of help and then go through an assessment phase. This assessment determines what areas of the community must be improved or rebuilt as well as the amount of funding the community will receive.

The Special Communities Initiative is a massive community redevelopment program being implemented in Puerto Rico. Of the 686 communities that have been identified as Special Communities, many are now going through the assessment process. Private companies, such as CSA Group, are receiving contracts from the government to complete these assessments.

In early 2003, CSA Group completed 18 assessments of Special Communities, but did not use a standard evaluation process. As a result a new infrastructure assessment form and a standardized process for the evaluation of Special Communities were needed.

3.0 Methodology

3.1 Introduction

The goals of this project were to establish the DTOP's intended scope for the evaluations, create a process for the evaluation of communities, and design better data collection methods. To address these goals, we sought to answer the following questions: What are the needs of the DTOP? What is the best evaluation process to meet the needs of the DTOP given the specific time constraints? What is the best way to collect and display data for community assessment?

Briefly, our methods were focused on both developing a standard process for evaluations of Special Communities as well as creating a new assessment form to support the overall evaluation process.

We completed this methodology using three stages: Evaluation, Analysis, and Application and Testing. In the remainder of the methodology we present the steps necessary to complete our project.

3.2 Evaluation

In our evaluation stage we completed a step-by-step evaluation of the current process used in assessing the Special Communities by CSA Group. We completed this evaluation through interviews with CSA field architects and engineers, CSA Project Managers, specialists from the GIS Department at CSA, the Director of Community Development from DTOP, and the Community Development and Self-Reliance Coordinator from the Special Communities Office.

We chose interviewing as our primary data collection method because we had ability to meet with all of these people and some we met with on a constant basis. This familiarized us with the assessment form and process, the intended use of the final report, and the scope of the Special Communities Initiative.

Based on these interviews we completed a preliminary assessment form and created a standardized evaluation process. The evaluation phase was essential to determine the effectiveness and completeness of the assessment form and evaluation process helping us to identify the changes that were necessary.

3.2.1 CSA Project Manager Interview

We interviewed CSA's Special Communities Project Managers, Cristina Custodio and Teresita Vega. Custodio and Vega were the two Project Managers during phase one of the evaluation process for CSA, so their insight was extremely helpful because of their close ties to the DTOP and the Special Communities Initiative. Through the interview we sought to determine how the evaluation process worked for phase one of the project, what the overall advantages and disadvantages were of the entire process, and what were the lessons learned from phase one.

3.2.2 DTOP Officials Interview

We interviewed Irene Perez, the Director of Community Development for the Department of Transportation and Public Works. The interview with Perez was critical because she is the official at the DTOP that reads the final report produced from CSA's community evaluation process. The purpose of the interview was to determine areas that

the CSA final report did not include and areas that needed improvement. By knowing the necessary criteria needed in the final report we could then created a more efficient assessment form.

3.2.3 CSA Field Team Architect and Engineer Interview(s)

Our most critical interviews pertaining to the assessment form were with CSA field team architects and engineers because they completed the Special Community assessments for the first phase of the project. We interviewed field team engineer, Juan Collazo, and field team architect Rosamil Cosme. From these interviews we were interested in identifying the advantages and disadvantages of the assessment form, what they found was useful in the assessment form, what ways of data collection were more valuable than others, and how the form could be improved to make the process run more smoothly.

We also were interested in determining from the individual field team members the different ways they used to collect data other than the assessment form given to them by CSA. This information could help to determine a process that can be used in the evaluation of all Special Communities in future phases.

3.2.4 GIS Interview

We interviewed specialists from the GIS Department at CSA Group, Jose Lopez, Jorge E. Rodríguez, and Elena Vazquez, to determine what type of background information on a Special Community could be gathered from GIS maps. We also wanted to determine what would be the most useful GIS maps for field team members to use before and while they are in the field. Gathering information from this interview would be important in standardizing the preliminary steps of our evaluation process.

3.2.5 Special Community Office Interview

We interviewed, María Lourdes Rivera, Coordinator of Community Development and Self-Reliance from the Special Communities Office in order to determine what information the office can provide to the field teams previous to the assessment of a community. We also sought to understand the entire scope of the Special Communities Initiative and the short/mid/long term goals of the projects.

3.2.6 Field Research

According to Singleton (1999), “Field research is essentially a matter of immersing oneself in a naturally occurring (rather than a “staged”) set of events in order to gain firsthand knowledge of the situation”. Therefore, besides interviews, we used field research to evaluate the process and assessment form.

To understand the GIS Department’s role within the evaluation process we went into the field with Jose Lopez, a member of the GIS department while he took the GPS coordinate of each Special Community for the second phase of the project. We interviewed him while this occurred to determine how the GIS Department collaborated with field team architects and engineers working on the Special Community assessments during the first phase.

We observed Project Manager, Teresita Vega at a meeting she attended with the mayor, community leader, and government liaison of the Special Community of Villa

Quintero from the Tao Baja municipality to determine how the first step in CSA's evaluation process worked for the first phase of the project.

In order to determine what a Special Community looked like in the fifth and final stage of the Special Communities Initiative we visited the community of Cantera. We interviewed and toured the community with Angel Colón, Director of Physical Development of the Cantera Peninsula Project to better understand the history and redevelopment progress of Cantera.

Another part of our field research was the observation of the field team architects and engineers while they assessed a Special Community in order to determine how they used the assessment form in the field and if there were any deficiencies with it.

3.3 Analysis

From the data gathered during the Evaluation Phase of our methodology we then analyzed and critically critiqued all the information pertaining to the assessment form and evaluation process.

3.3.1 Assessment Form

We critically critiqued the feedback that we received on the assessment form during the Evaluation phase. We analyzed the feedback by having our group review all information that was presented to us during the interviews. From this point we then began to make a preliminary assessment form. After our initial rendition of the assessment form we presented it to Project Manager Cristina Custodio and senior field engineer Juan Collazo to receive their feedback. From there we again reviewed her feedback as a group and made the necessary changes to the assessment form. We repeated this step multiple times allowing us to create a better-quality assessment form.

3.3.2 Evaluation Process

Next we analyzed the interviews that pertained to the process as a whole. This again included discussing all interview results within our group before we began to create the preliminary process. We then streamlined the existing process to fit the needs of CSA and the DTOP.

From all of the information that we gathered, we then produced a preliminary evaluation process which included our recently completed assessment form. We took into consideration everyone that was involved in the step-by-step procedure of the process. We were also able to meet the needs of the DTOP, CSA field team architects and engineers, Project Managers, the GIS Department, and officials form the Special Communities Office allowing us to create our final working process.

By discussing the preliminary process with field team members and Project Managers, we again received their feedback. With the new feedback and their suggestions we made an improved process. These last two steps were repeated multiple times until we created an evaluation process that was superior to the previous process. An improved process consists of the steps necessary for the evaluation of the communities in the preparation stage, evaluation stage, and drafting stage.

3.4 Application and Testing

CSA Group did not start the second phase of the Special Communities Project until after we had left Puerto Rico due to unfortunate circumstances. Therefore we were not able to complete this part of the methodology.

Had this not occurred we would have ensured that our new process was more efficient than the original by applying it to a community. Our plan was to have CSA field engineers and Project Managers evaluate a community using our new process. From the initial usage of our form, we would have been able to gather their thoughts on how the new process compared to the old process.

Once we had evaluated a community, we would have then edited the evaluation process according to our findings in the field. These improvements would have addressed any deficiencies discovered while in the field for the first time.

After we had completed several iterations of revisions on our process, we would have then been ready to submit our forms and process guidelines to CSA field engineers to use in the field. After their experience using our process to evaluate a community, they would have been able to provide expert feedback which again would have been taken into consideration when developing our final evaluation process.

3.5 Summary

Although our proposed methods encompassed a full range of activities needed to develop a new assessment methodology and form, not all aspects of our proposed methods could be actually implemented. In the following section we will present our data, its analysis, and our results.

4.0 Results and Data Analysis

4.1 Introduction

The purpose of this section is to present our data, the analysis of that data, and to explain our results. Most importantly, the standardized evaluation process for the assessment of Special Communities and new physical infrastructure assessment form will be explained.

4.2 Special Communities Evaluation Process

Irene Pérez, the Director of Community Development at the DTOP, stated "The final product of these Special Community assessments is a report which will be used as a historical document for future redevelopment projects." The final report was intended to give short-term recommendations for immediate improvements to the community along with recommendations for mid and long term redevelopment projects that would be addressed in the future. After improvements were made through the funding of the Special Communities Initiative, the DTOP would be able to once again review the final report and determine what other areas of the infrastructure need redevelopment. We understood that each Special Community report was intended to be used as a historical document and by working backwards we determined all the steps needed to create the most thorough report. Since there was no standardized process for phase one we created a 12-step evaluation process which can be seen in Figure 2.

Based on interviews with field team architects and engineers and Project Managers we determined that CSA did not use a standardized process during the evaluation of Special Communities during the first phase of the project. The lack of a standardized evaluation process led to the submission of incomplete reports by the field team. Field team members received very little background information on the communities prior to their arrival in the community. Subsequently, the field team had no standardized form to collect data from a community. Some used notebooks and scrap paper while others tried to develop their own forms. When they wrote their reports the field team members used different descriptions of problems with no set standard. When these reports went to the Department of Transportation and Public Works they varied in their technical content.

In the following sections, each step of the evaluation process will be discussed and described in the context of what was originally proposed, the problems that were encountered, and our solutions to the problems.

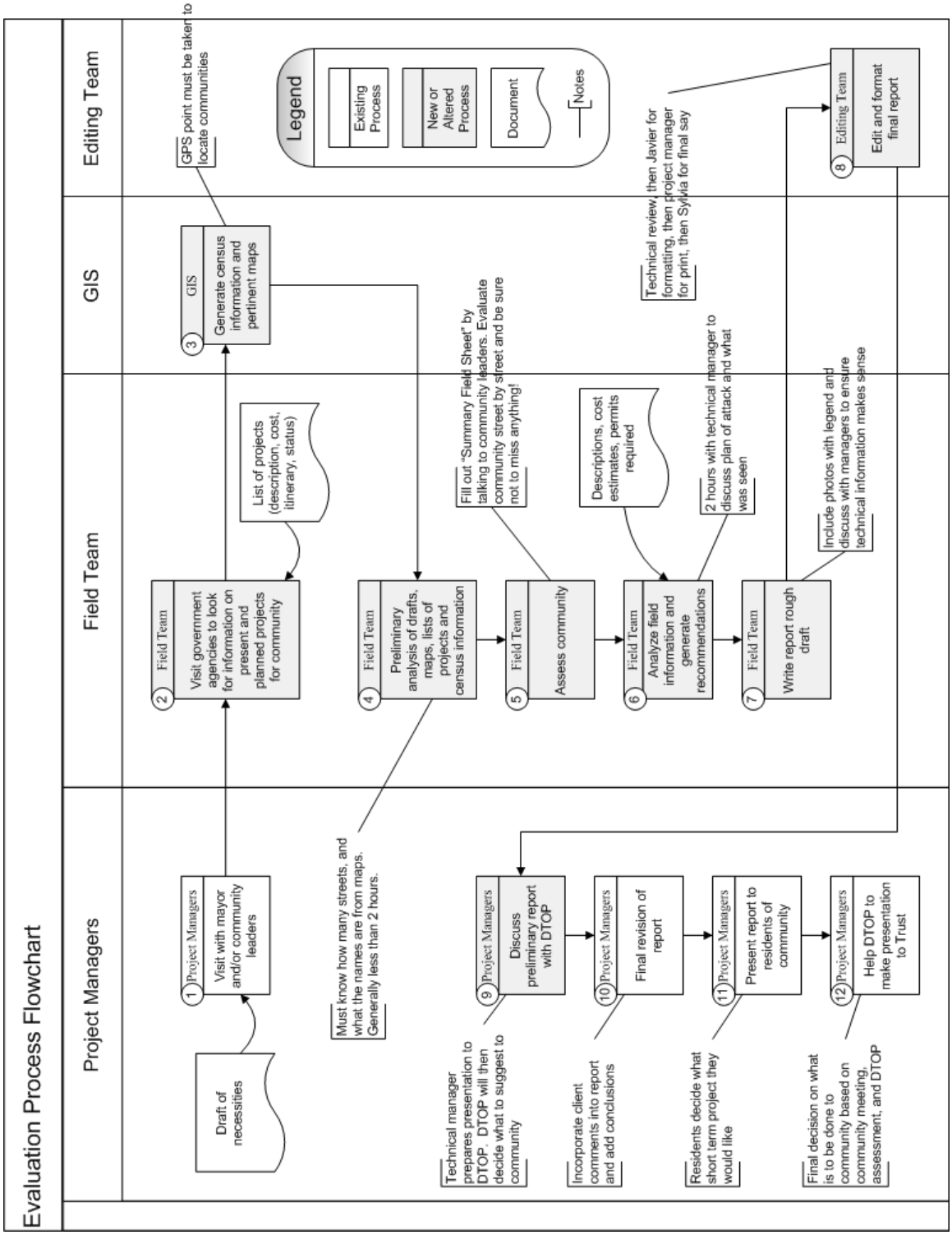


Figure 2: Special Communities Evaluation Process Flowchart

4.2.1 Interview with Mayor and/or Community Leaders – Step 1

Current Conditions:

Through interviews with Project Managers Teresita Vega and Cristina Custodio we learned that during phase one of the project, the Project Manager set up a meeting with the mayor, the promoter, and community leaders of the Special Community that was to be assessed. The Project Manager then determined the problem areas of the community based on discussion with the community leaders and mayor. After the meeting the Project Manger wrote a meeting summary which was then passed on to the field team for preliminary analysis before they went into the field to complete the assessment. The information supplied by the community leaders gave the field team members a preliminary outlook of the community and allowed them to concentrate on the problem when assessing the community.

Problems:

Through our analysis of Step 1, no problems were found.

Proposed Solutions:

Due to the efficient gathering of data from these interviews between the Project Manager and community leaders this step should not change for the following two phases.

4.2.2 Visit Government Agencies – Step 2

Current Conditions:

During phase one of the project, field team members did not visit government agencies such as the DTOP and the Special Communities Office before completing the assessment of a Special Community.

Problems:

Through our interviews with field personnel we discovered that during the first phase there were miscommunications between the government agencies working on the Special Communities Initiative. CSA field engineers would assess a community and present recommended projects to the DTOP only to find similar projects were already under construction, or were planned for the future of that community.

Solutions:

If the field team visits the DTOP and Special Communities Office then they will know in advance if a project is taking place to redevelop a section of the community. They will not have to spend their time with an assessment or a cost analysis of that section because it will have already been done.

4.2.3 GIS Background Information – Step 3

Current Conditions:

Initially CSA did not know the exact location of the Special Communities they were contracted to assess. CSA was only given the name of the town or municipality that each Special Community is located in and had to find the exact location of the community on its own. According to Jose Lopez, a CSA GIS department surveyor, in order to determine the location of the communities, personnel from the GIS department went into each community with a GPS (Global Positioning Satellite) location unit and determined the exact coordinates of the community. With this information, GIS mapping software (Arc View) was used to obtain census data at four different levels: barrios, census track,

block groups, and blocks. Blocks are the most specific type of census data which allows information to be taken from a specific street of a community. GIS information provided not only census data but also many types of maps.

Problems:

Field Engineer Juan Collazo explained that during the first phase of the project GIS map resources were rarely utilized, usually only used by engineers to physically locate a community.

Solutions:

According to Teresita Vega Technical Project Manager during the next two phases of the project, field team members should be review the following GIS map layers both before and during each community assessment:

- Aerial Photo
- Gas Station
- Residential Zones
- Archeological Sensitive Sites
- Wetlands
- Electrical Lines
- Flood Zones
- Schools
- Water Mains

With all of these layers, field team engineers can obtain a vast amount of information about a community before they visit. This will save them time in the field and allow them to pay closer attention to the major problems of the community. The residents of the community will also benefit because they will receive a more thorough assessment of the problems which plague their community. With these GIS resources the field team engineers can focus more time recording the details of each problems and consequently create more accurate cost estimations. There is only $500,000 allocated to each community so the estimations should be as accurate as possible in order for the community to benefit the most from the Initiative.

4.2.3.1 GIS Map of the Aerial Photo Data Layer (Appendix L)

As stated by Teresita Vega, the aerial photo data layer of the community can be extremely useful to field engineers before they go into the field. From this photo they can develop a sense of the layout and extent of the community and determine how many houses and roads make up the community. They can also use the map as a road map and determine how to access the community from different access points.

According to Jorge Rodríguez, a member of the GIS Department, field engineers can use computer software to measure the lengths and widths of roads, with good precision, and save considerable time in the field. These measurements are critical to engineers when they make cost estimates of water systems, sewer systems, and road construction.

4.2.3.2 GIS Map of Gas Stations Data Layer (Appendix M)

Project Manager Vega stated that the gas station data layer can help field engineers identify potential contamination or pollution sources in the community due to leakage of underground storage tanks. The GIS map lists all the areas where gas stations appear in

the municipality of the community. If they know this information beforehand, field engineers will not need to locate gas stations in the field and will be able to use their time to focus on other community issues.

4.2.3.3 GIS Map of Residential Zones Data Layer (Appendix N)

The residential zone data layer shows the different residential zones of the community. According to Teresita Vega that this map can be useful because it shows the different population densities of the Special Community and communities surrounding it. This map layer will help the field team to gather vital census data to help them fill out preliminary assessment forms.

4.2.3.4 GIS Map of Archeological Sensitive Sites Data Layer (Appendix O)

This archeological sensitive sites data layer shows the areas in and around the community where there are archeologically sensitive sites. Teresita Vega explained that construction cannot be undertaken in any of these areas. With this knowledge field engineers will not waste their time assessing and making cost estimates in areas that cannot be developed.

4.2.3.5 GIS Map of Wetlands Data Layer (Appendix P)

The wetlands data layer shows all the wetland areas in the community and its surrounding area. Ms. Vega explained that the location of wetlands is important because any development in wetlands needs special permits, and in general development in wetland areas is discouraged. This map displays the location of wetlands and the coordinating permits needed to develop them in the different areas throughout the community. This map layer will save field engineers time when they make their initial cost estimates and prevent the development of proposed projects located in wetland areas where permits cannot be obtained.

4.2.3.6 GIS Map of Electric Lines Data Layer (Appendix Q)

This electric lines data layer shows the location of electric lines throughout the community. Ms. Vega expressed the importance of knowing the location of electrical lines because there may be communities where some residents have electricity and others do not. Even more surprising, there may be some communities that lack any kind of electric infrastructure. If engineers have this information prior to their visit they can make a preliminary assessment of the electric system of the community and verify the information when in the field.

4.2.3.7 GIS Map of Flood Zones Data Layer (Appendix R)

According to Project Manager Teresita Vega, the flood zones data layer is another critical map for field engineers to see before they go out into the field. If field engineers look at this map they will know instantly if the community is in a flood zone and if so what type of zone it is. Depending on the type of zone the community is in they may not be able to redevelop. Building codes in Puerto Rico specify that there can be no development in Flood Zone 1 and special permits are needed for development in Flood Zone 2. Field engineers with this flood zone information will not spend their time in

zones that cannot be redeveloped and can factor the permitting process into their project cost and time estimations.

4.2.3.8 GIS Map of Schools Data Layer (Appendix S)

The schools data layer shows where schools are located in relation to the Special Community. Vega stated that with this map the engineers can determine how far students must travel in order to get to school. Having this information, field engineers will be able to determine if a new school needs to be build closer to the community. Some of the Special Communities are squatter communities, meaning they were not planned by the government therefore they are usually lacking basic public services, schools being a very important one.

4.2.3.9 GIS Map of Water System Data Layer (Appendix T)

The water system data layer shows the exact location of the water system, if one exists, within a community. Water services are a basic human need, and providing water to all community residents is a priority of the Puerto Rican government. Teresita Vega explained this map resource can allow the field teams to quickly identify any areas of the community that do not have access to water services.

4.2.4 Preliminary Analysis – Step 4

Current Condition:

During the first phase of the project the field teams did not review background information before they completed their on-site assessment of a Special Community.

Problems:

Project Manager Cristina Custodio explained that the field teams had only one day to complete the on-site infrastructure assessment and one day to write the report draft. There was no time allotted before the on-site assessment to complete a preliminary analysis because of time and cost restraints.

Solutions:

According to Custodio, the field team can review GIS maps, census data, the community leader meeting summary, and any information gathered from government agencies. With this information the field team can anticipate the possible infrastructure deficiencies in each community and spend more time on the major issues within the community completing a more thorough assessment.

4.2.5 Field Team Assessment – Step 5

Current Conditions:

During phase one of the project CSA field engineers were expected to use an evaluation form which was created by the Project Manager (Appendix C). However, the form was found to be ill suited for this application and not used.

Problems:

According to field engineer Juan Collazo and field architect Rosamil Cosme the original form was too general, was not organized at a street level, and the database that was to be used with this form also did not function properly. Therefore, neither the form nor the database were used. Juan Collazo created his own version of an assessment form (Appendix D) to be used along with a notebook and a few GIS maps but the maps were

used more for directions rather than for infrastructure information. However, Project Manager Custodio explained, Collazo's form was based on a street-by-street assessment and was incomplete because it did not leave any room for more general information. Also his form lacked sufficient space for comments on specific problems in the communities.

Solutions:

After the first phase was completed a luncheon was held to discuss improvements to the evaluation process. This meeting, which was attended by all employees associated with the project, generated a list of the lessons learned during the first phase (Appendix I). From this list of pros and cons along with Juan Collazo's form we made our initial evaluation form (Appendix E). However we never had this form evaluated by field engineers or Project Managers because we immediately noticed that the form lacked important information and there was no room to make comments.

We then developed our second iteration of the assessment form (Appendix F). According to Juan Collazo we needed to include: telephone service, cable service, street length and roadway widths. Along with these improvements, Project Manager Cristina Custodio commented on the second page of the form. She wanted us to add in a box for general technical descriptions, any permits that were necessary, and a cost estimation section. With this feedback, along with our own new ideas, we created our third iteration of the assessment form.

With the third form we had added a Field Study Compilation Sheet for general information about the community. Cristina Custodio recommended that we add: promoter name and contact information, community borders (constraints), community size, resident type (define), water sources, and access (traffic flow). She was impressed with the Field Assessment form and decided that we only needed to add a section for connection points for when evaluating the storm and sanitary sewer systems. She was also impressed with the new format. We altered the format by placing only one street per page unlike the previous form that had five streets per page, thus creating more room to take notes. We also drafted a new General Assessment Form to be used throughout the entire community, not just street specific. This form would provide information on the location and condition of resources like hospitals, schools, community centers and etc. Again, Cristina was content with the form but felt that it could be organized better with more space provided to write the physical location of these community resources.

The last form we created was the Major Problem Area Form. This form was intended to be used in the field when a problem was identified as significant enough that the field team would need to create detailed estimate for possible solutions. Since field engineers only visited each Special Community once and would not have another chance to gather detailed measurements or photos, it was important that we created a form in which they could develop tentative solutions. Cristina only had a few comments on this form, mostly about the format of the form, however she did recommend that we make the Cost Estimate, Permit, and Technical Descriptions Sections larger because those sections required the most writing.

With all of the feedback that we received from Juan Collazo and Cristina Custodio along with in-group discussion, we produced our final iteration of the Evaluation Form (Appendix H). We felt that this final form contained all the information needed to write a complete report to the DTOP based on their established report outline (Appendix J), and

was extremely user friendly. CSA translated our final Evaluation Form into Spanish and planned to employ it when the second phase of the project began.

Project Manager Custodio suggested that we create an information sheet to explain our new forms to the field team. After creating a preliminary draft of the instructional form, we worked with Project Manager Custodio to finalize the technical explanations of each section of the form (Appendix K).

4.2.6 Field Team Recommendations – Step 6

Current Conditions:

During phase one, field team members were not gathering enough data in the field to make accurate cost estimates. During the on-site evaluations the data needed to create detailed cost estimations was sometimes not organized well or not gathered at all.

Problems:

Field team members had to write detailed solutions to infrastructure problems for the final report to the DTOP, however, they did not collect enough data or the correct data when in the field to make the estimates.

Solutions:

All field team members that have assessed Special Communities have at least eight years of work experience, and are well qualified to produce accurate cost estimates of the needed infrastructure improvements as long as they have all the data needed. Therefore, the solution is to provided them with a thorough data collection method for infrastructure problems. Our new assessment form contains a Suggested Projects/Solutions form designed specifically for this.

4.2.7 Report Rough Draft - Step 7

Current Conditions:

After the on-site evaluation the field team generated a preliminary report of the assessment. This rough draft followed an outline provided by the DTOP (Appendix J). Before the project began the project managers anticipated that these reports would be written the day after the community assessment while everything was still fresh in the field members' minds. Included in the report were descriptions of the community's infrastructure problems and their possible solutions, a cost estimation of the solution to each infrastructure deficiency, and a time estimate for the design and construction of each project. The DTOP wanted the proposed projects classified as short, mid, and long-term community goals. Relevant photos were included to provide DTOP with an idea of the community's well being. After the rough draft was completed the field team met with the editing teams and ensured that all technical information was clear and concise.

Problems:

We discovered, through interviews with field engineers, that during first phase of the project, field teams often spent several days in the field and assessed numerous communities before they returned to the office and wrote the rough drafts of each community's report. They did not write the rough draft the day directly after the assessment as was anticipated. Field teams referred to their notes when they wrote these reports and if their notes were not detailed and descriptive it was extremely difficult to draft the reports.

Solutions:

In order to write the most thorough report rough draft, field teams should complete the draft the day following the assessment. By doing this, all information from the assessment will be fresh in each field team members' minds and any gaps in their notes can be addressed immediately.

4.2.8 Edit Final Report – Step 8

Current Conditions:

After the field teams developed their rough draft of the report, it was sent to an editing team. Technical managers, project managers, and veteran engineers edited the report for grammatical and technical errors. After several iterations which corrected the writing and technical mistakes, the draft was then formatted and printed. Before it was sent to the DTOP the report was read one final time by the project manager, and Project Controls member Sylvia Vazquez.

Problems:

According to the Project Managers, during the first phase the Technical Manager carried to large of a workload between editing the report for grammar, formatting, and technical content and other steps that she was involved in within the process.

Solutions:

To remedy this problem there should be a designated editing team so the Technical Manager can concentrate solely on the technical content of the report and not the grammar or formatting.

4.2.9 Discuss Report with DTOP – Step 9

Current Conditions:

After editing the final report during phase one of the project, the report was then given to the DTOP without any discussion.

Problems:

According to Project Managers, CSA handed in all final reports at once to the DTOP in the first phase. There was very little communication between CSA and the DTOP during the assessments leading to some confusion over the final format and content of the report.

Solutions:

After the report is complete, CSA's Project Manager should prepare a presentation for DTOP officials. After this presentation the DTOP can decide which projects proposed by CSA should be recommended to community residents during the community presentation. After the presentation to DTOP officials CSA should edit the report one final time.

4.2.10 Final Revision of Report – Step 10

Current Conditions:

During phase one of the project this step did not occur because Step 9 had never occurred.

Problems:

There are no problems from this step because it never occurred before.

Solutions:

After the DTOP presentation, CSA should edit the community reports one final time so that they can provide additional information about the issues the DTOP was interested in during the presentation. After the DTOP identified the areas that they want presented to the community, CSA should provide more detail about those specific problem areas. In addition, any photos that are left out of the report that pertain to the specific problem areas the DTOP was focused on, are then included as visual aids.

4.2.11 Community Presentation – Step 11

Current Conditions:

In phase one of this project community presentations were conducted by CSA Project Managers. Community presentations were intended to be a time when CSA could present their recommended physical improvements to the community residents. After they listened to the presentation community members could then ask the managers questions about the proposed projects. CSA managers answered any questions residents had about the improvements recommended for their community, and once the discussion ended the recommendations were voted upon by the community members. This presentation and discussion time allowed the residents to receive expert opinions about the condition of their community and the urgent improvements needed. It was the community itself which had the final say in what improvements would be completed, not the DTOP officials or CSA engineers, and the results of the community's vote were later presented to the Special Communities Trust.

Problems:

Through our analysis of Step 11, no problems were found.

Solutions:

Due to the importance of CSA presenting their final report to the Special Communities and the fact that these presentations ran extremely well during the first phase, this step should continue for the next two phases.

4.2.12 Assisting the DTOP – Step 12

Current Conditions:

Once the assessment, reports, and presentations were completed, CSA then helped the DTOP with its presentation to the Special Communities Trust. The Trust was composed of high ranking and distinguished government officials from around the island. These Trustees ultimately determined how much funding was allocated for each community presented. Although $500,000 was roughly determined to be the amount of funding for each community, there were special circumstances that deemed extra funding appropriate. Because CSA employees knew the most about the communities they assessed, they were on hand to provide technical information to the Trustees.

Problems:

Through our analysis of Step 12, no problems were found.

Solutions:

It is vitally important that CSA assist the DTOP when presenting to the Special Communities Trust because they are most familiar with the Special Communities. CSA completed the assessments on the Special Communities so they can answer any technical

questions. This step was handled extremely well by CSA during the first phase of the project therefore it should continue during the second and third phase.

4.3 Application and Testing

Due to circumstances beyond our control we were unable to complete the Application and Testing stage of our methodology. We felt that this did not have a large affect on our results or recommendations. We were able to overcome this stage with constant contact with CSA field team architects and engineers and Project Managers. We created the evaluation process and assessment form based on the critiques of the field team members and the Project Managers.

4.4 Summary

During the completion our methodology we complied vast amounts of data related to the evaluation process and assessment form. Through our data analysis we broke down each step of the evaluation process and came up with several results. Based on these results we will present our recommendations in the following section.

5.0 Conclusion and Recommendations

Our project focused on the improving the Special Community evaluation process used during the first phase of the project by CSA. Over the course of seven weeks we completed our methodology and collected data relevant to this subject. We achieved our goal of creating a standardized evaluation process along with the creation of a new physical infrastructure assessment form. This standardized evaluation process and assessment form will be used by CSA Group for the final two phases of the Special Communities Project.

5.1 Special Communities Evaluation Process

Conclusions:

- The original CSA evaluation process to assess a Special Community was not standardized and complete. Because there was no standardized process the final reports that were sent to the DTOP varied in content. Descriptions of infrastructure problems within communities were not always reported in the same manner which could have led to inaccurate findings.

Recommendations:

- We recommend that CSA use our newly standardized 12-step process (Figure 2) to evaluate Special Communities in the second and third phases of the project. By using our new 12-step process there will be standards in place to ensure that all of the reports contain the same technical content leading to a more thorough and valid report.

5.2 Interview with Mayor and/or Community Leaders – Step 1

Conclusions:

- Prior to the assessment of the community from the field team members, the Project Managers met with the mayor and community leaders to get their input on all of the physical problems of the community.

Recommendations:

- We recommend this step be completed for phases two and three in the same manner as the first phase. This step worked extremely well in the first phase because the field team members and Project Managers were able to get a better understanding of the community's problems before completing the assessment.

5.3 Visit Government Agencies – Step 2

Conclusions:

- During the first phase of the project, the lack of communication between government agencies and CSA led to inefficient assessments. The field team members sometimes completed evaluation of infrastructure problems and made cost estimations only to find out that these problems had already been assessed.

Recommendations:

- Based on these problems in the first phase we suggest that field team members visit the following government agencies: the DTOP and the Special

Communities Office. This will ensure that field team members know about any and all projects occurring within the community they are assessing.

5.4 GIS Background Information – Step 3

Conclusions:

- The GIS Department contains a great deal of census information and GIS maps for each Special Community which was not fully utilized during the first phase of the project. These GIS maps can allow the field team members to make a preliminary analysis of a Special Community and they give them general background information. This will permit field team members to spend more time in the community focusing on the problem areas of the infrastructure, improving efficiency.

Recommendations:

- We recommend that the field team members take full advantage of the GIS Department by using the following maps of GIS data layers:
  - Aerial Photo
  - Gas Station
  - Residential Zones
  - Archeological Sensitive Sites
  - Wetlands
  - Electrical Lines
  - Flood Zones
  - Schools
  - Water Mains

5.5 Preliminary Analysis – Step 4

Conclusions:

- This is an important step that did not occur during the first phase of the project. This step allows the field team to look over the GIS maps, review the census data, analyze the minutes from the interview with the mayor and/or community leader, and determine if there are any current projects going on within the community. This will make the process more efficient because the field team will be able to concentrate on the major problems of the community. This will lead to more thorough documentation of the problem areas.

Recommendations:

- We recommend that the field team take advantage of this step because they can complete a preliminary analysis of the Special Community. With the information from all previous steps the field team will be better equipped with to assess the community.
- This step should take no more than two hours.
- Field teams should fill out the Field Compilation Sheet and any relevant areas on the Street Evaluation Form and General Evaluation Form.

5.6 Field Team Assessment – Step 5

Conclusions:

- During phase one of the project there was no standard assessment form for evaluating the infrastructure of Special Communities. The data collection methods that the field team members used were incomplete because they did not cover all of the fields that were necessary to fill out the DTOP's outline for the final report.

Recommendations:

- We recommend that the field teams use our new 5 page infrastructure assessment forms which contains: a Field Study Compilation Sheet, a General Assessment Form, a Street Assessment Form, a Suggested Projects/Solutions Form, and a Resident Comment Form (Appendix H). These 5 forms cover all areas of the outline for the final report provided by the DTOP.
    - We recommend the use of the Field Study Compilation Sheet. This should be filled out before going to the community. This information is very general and contains such areas as number of houses or number of streets. This information can be obtained from the mayor and/or community leader.
    - We recommend the use of the General Assessment Form. This form should be filled out when the field team first arrives at the Special Community. The information on this form can be gathered by simply driving through the community.
    - We recommend the use of the Street Assessment Form. One form should be filled out for each street. These forms should be filled out after the field team has made their general assessment of the community.
    - We recommend the field teams use the Suggested Projects/Solutions Form. This form should be used when a major problem has been identified within the community. With this form the field team members should be able to gather enough amount of data to completely assess the problem, make technical comments, and be able to make cost and development time estimates.
    - We recommend the Resident Comment Form. This form was created to put a face to the community. The residents of the community are the most important part of the redevelopment process so their comments are vital to what occurs within the community.
    - Lastly, we recommend that the field team use our eleven-page reference manual (Appendix K) to address any and all question pertaining to our new assessment forms. The manual also gives standards for each field in the assessment forms that the field team members should use. This will ensure the same technical content in the final report.
- Before leaving the community, the field team should review all the forms to make sure the assessment was completed in full.
- The field assessment should take one day to complete.

5.7 Field Team Recommendation – Step 6

Conclusions:

- Cost estimations for larger projects were not being completed in full. Sometimes their was crucial information that was not recorded in the field which led to cost estimations that were not as accurate as they could have been.

Recommendations:

- Properly use the Suggested Projects/Solutions which will be able to provide a detailed description of what the problem is, how to solve it, how much time and money it will cost, as well as all necessary permits and problems that may arise.
- After the field assessment is complete, the field team who completed the assessment must then meet with the Technical Manager to discuss what was observed in the community.
- After all the problem areas are documented, a map should then be generated to show the location of each of these problem areas along with pictures documenting the problem areas.
- This meeting will last no more than 2 hours.

5.8 Report Rough Draft – Step 7

Conclusions:

- During the first phase of the project field teams completed assessments of communities for several days straight before having a chance to produce their draft reports on their findings in the communities. This led to incomplete draft reports because there was no way for the field teams to distinguish one community from another.

Recommendations:

- We recommend that field teams use two days to assess a community. One day to complete the assessment and the next day to complete the draft report.

5.9 Edit Final Report – Step 8

Conclusions:

- During the first phase of the project field teams would write their draft reports then send them to the Technical Manager for editing. The problem was that the Technical Manager was involved in several other steps in the process which put too much of a work load on her shoulders. This led to less editing time before submitting the final report to the DTOP.

Recommendations:

- We recommend that during the second phase of the project, there be a designated editing team who can review grammar and formatting. This leaves the Technical Manager to only review the report for technical content and correctness. This will lighten the workload, and allow for a more thorough examination of the report focusing on the technical review.

5.10 Discuss Report with DTOP – Step 9

Conclusions:

- During the first phase this step did not occur often making unclear what the DTOP wanted in the final report and what the role of CSA and the DTOP would be in presenting the final report to the community.

Recommendations:

- We recommend this step in the evaluation process because it is important for the Technical Manager to discuss with the DTOP the conclusions that have been made by the field engineers regarding the infrastructure of a specific community. Both the Technical Manager and the DTOP can discuss what problems are facing the community and what solutions should be presented to the community residents.
- At this discussion the DTOP should decide which aspects of the report are going to be focused on when presenting the project proposals to the community residents.

5.11 Final Revision of Report – Step 10

Conclusions:

- During phase one of the project this step did not occur because there was never a preliminary meeting to discuss the report with the DTOP. This is a crucial step because once the report has been submitted to the DTOP for the last time, the report will become a historical document that is used in the future by government agencies to assess the needs of this community.

Recommendations:

- We recommend that this step must occur in order to make sure that the document is in agreement with the comments of the DTOP, the necessary conclusions have been added, and the report is correctly formatted.

5.12 Community Presentation – Step 11

Conclusions:

- During phase one of the project CSA presented their findings and conclusions from the assessment to each Special Community. CSA made recommendations to the community on what improvements they believed the community should undergo. However in the end the residents of the community decided what improvements they wanted.

Recommendations:

- We recommend that this step stay in place because it was done previously in phase one and worked extremely well.

5.13 Assisting the DTOP – Step 12

Conclusions:

- During phase one of the project CSA assisted the DTOP when they presented the community's recommendations to the Special Communities Trust. Since CSA was involved with the presentations to the community they knew best what the improvements the community wanted.

Recommendations:

- We recommend that this step continue on throughout phase two and three of the project. This is a step that CSA has to perform in order for the Special Communities to receive money for the projects that they would like completed. CSA as already developed a process for assisting the DTOP with the presentation, and this process will stay in place.

5.14 Summary

Based on all of our results these are our final recommendations to CSA Group pertaining to the process they use to evaluate the infrastructure of Special Communities. It is our understanding that CSA Group has adopted our evaluation process along with our infrastructure assessment form, which has been translated into Spanish, for use in the second and third phases of the Special Communities Project. It is our hope that our evaluation process will yield a more thorough final report allowing the Special Communities of Puerto Rico to receive the full benefits of the Initiative.

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Appendix A
Communities Participating in the Special Communities Initiative:

Bda. Acueducto	Cuyon	Río Jueyes
Calle del Agua	Las Quebradas en Monte Grande	Barriada Zambrana
Guayo	Pedernales	Sector Sabana Hoyo
Barriada Rullán	Puerto Real	Bo. Piñas Abajo, Sector Villa Brava
Saltillo Vaca	El Fuego y Las Piedras (Guaniquilla)	La Juncia (Bo. Rio Hondo II)
Tanamá	Bo. Río Cañas, Sector La Barra, Com.	El Higüero (Bo. Palomas Abajo)
Yahuecas Arriba	La Quebrada	El 26 (Bo. Palomas Abajo)
Sector García	Los Muchos	El Verde (Bo. Naranjo)
Bo. Guaniquilla, Parcelas Noboa	Bairoa La 25	Barriada Cielito
Nuevas	Los Panes (Bo. Beatriz)	Río Hondo
Bo. Guanaquilla, Parcelas Noboa Vieja	Lajitas	Vuelta del Dos
Com. Las Flores	Barriada Morales	Cuba Libre-El Idilio
Calle San Francisco	Hoyo Frío (en Las Carolinas)	Bo. Coto, Sector San Antonio de la
Calle San José	Bo. Borinquén, Parcelas Viejas	Tuna
Parcelas Nieves	Savarona	Sector El Cañón
Parcelas Matías	Comunidad Puertos	Barriada Corchado
Bo. El Palmar	Pueblo Norte (Calle Estrella)	Bo. Guerrero, Sector El Ramal
La Vía	Puente Pica	Barrio Salientito
Cerro Calero	Pueblo Nuevo	Comunidad Márquez
Cuesta Vieja	Puente Peña (Maracayo)	Santa Clara
Poblado San Antonio	Parcelas Nuevas, Bo. San Isidro	Vista Alegre (Sector Las Casitas)
Cerro Visbal	Parcelas Viejas, Bo. San Isidro	Comunidad Mario Canals (Sector El
Las Corujas	Jardines de Palmarejo	Salto)
Parcelas Santa Clara	Sector Los Navarros	Barrio Saliente
Barrio Bayamoncito	Sector Villa Delicias	Barrio Gripiñas
Bo. Sonadora	Cambalache	Hoyo Frío
Centro Urbano	Las 400	Sector San Felipe
Cagüitas Centro	Las Lomas	Bo Las Arenas
Jagüeyes Abajo	Palmasola	Barrio Puerto Plata
El Fresal	La Central, Sector Sierra Maestra	Collores (Sector San Carlos)
Bo. La Plata, Los Muros	La Central, Sector Villa Borinquén	Arús (Pastillito)
Bo. La Plata, Amoladero	La Central, Sector Pueblo Indio	Cuevas (Sector Baldío)
Sector El Nueve	Villa Conquistador II	La Atómica
Los Cuadritos	Ext. Jardines de Palmarejo, Sector	Manzanilla
Barriada Municipal	Quintas	Callejón de los Perros (Los Buenos)
Parcelas Rabanal	Sector Monte Verde	Canta Gallo
El Campito	Villa Sin Miedo	Lirios Dorados, Hoyo Hondo
Las Bambúas	Sector Valle Hills	La Cuesta, Sector El Mangó
El Coquí	Villa Hugo I	Bo. Ceiba Norte, Santana I
Parcelas Nuevas, Bo. Pasto	Villa Hugo II	Rosalía, Sector El Mangó
Sector Gallera	Sector Alturas de Campo Rico	La Hormiga
San Luis	Buena Vista	El Caracol
Parcelas Viejas, Bo. Pasto	Villa Caridad	El Papayo
La Represa	La Villas (Justicia y Esperanza)	El Tendal, Sector Sabana Yeguas
La Españolita	Cuesta Quiles	Los Jovillos
Com. La Playa	Eduardo J. Saldaña - La Cerámica	Las Cuevas
Parcelas Marías	Saint Just	Maguayo
Caguabo	Sabana Abajo Norte	Piñalejos
Piñales (La Choza)	Sabana Abajo Sur	Tokio
Barrio Miraflores	Buenaventura	La Haya
Barrio Corcovada	Barrio Martín González	Seburuquillo
Barrio Hatillo	Canovanillas	Castañer
Barrio Cerro Gordo	San Antón	Cerro Avispa
Parcelas Josefa (Com. Espino)	Barrio Colo	Comunidad Anón
Los Muertos	Cucharillas	Comunidad Arizona
Calichoza	Puente Blanco	Comunidad El Bajadero
La Planta	Puntilla	Comunidad Peligro
Canta Gallo	Juana Matos	Comunidad San Felipe

Bo. Rio Arriba, Sector El Jobo	Cantera, Sector Jalda Abajo	Bo. Bucarabones, Sector La Josefa
Bo. Río Arriba, Sector El Valle	La Placita	Las Juanitas, Bo. Furnias
Sabana Hoyos, Sector Carolina	San Cristóbal	Sector Santa Rosa, Bo. Furnias
Buenos Aires (Magallanes)	El Coquí	Barrio Cerrote, Sector Bryan
El Cerro (Abra San Francisco)	Saint Thomas	Barrio Río Cañas, Sector Plato Indio
Esperanza (Cienagueta)	Cedro	
El Vigía	Vega	Bo. Cerrote, Sector Chamorro
Carreras	Jájome Bajo	Barrio Palma Escrita, Sector Palo
Cruz Roja	Barrio Saco	Prieto
El Cerro - Factor I	Las Calderonas	El Cerrito
Animas - Factor I	Parcelas Nuevas	Barriada Quebrada Grande
Palo Blanco	Prado Hermoso	Barrio Boquerón
Barriada Marín	Quebrada Seca	Lijas
Barrio Palmas	Cruces-Cialitos	Fondo del Saco
San Felipe-Arizona	Toro Negro	Barriada Rivera (Hoyo Gardens)
Bo. Yaurel	Santa Clara	Pueblito del Río
Abra del Pimiento	Parcelas María	Cinco Cuerdas
Abra los Caballos	Bo. Pozas, Sector El Hoyo	Bo. Honduras, La 23Polvorín
Bo. Garrochales, Sector Cite	Parcelas Cordillera	Felices Días
Palenque	Comunidad Los Ortega	Balboa
Calle Abajo (Calle Meliton Pérez)	Parcelas Seguí	Calle Melilla
Barrio Cañabón	Barriada Ferrer	Zapatería Pizarro
La Torre	La Línea	Villa Santos
Bda. La Vega	Candela	El Jobo
Los Pinos	La Milagrosa	Piñones
Barriada El Amparo	Río Abajo	Villa Cañona 1 y 2
Quebrada Grande	Santa Teresita	Colobó
Tres Caminos	Comunidad San José (Laberinto)	Tocones
Barrio Pájaros, Bda. Cedeño	Cuyón	El Ceiba
La Morenita I	Río Jueyes	Bo. Honduras, Sector Villa del Carmen
La Morenita II	Parcelas Seguí	Bo. Honduras, Sector Pompeya (Los
Parcelas Sabanas	Barriada Ferrer	Pizarros)
Abra Estrecha	La Línea	
Barriada Vista Alegre	Candela	Miñi Miñi
Barrio Juan Sánchez	La Milagrosa	Pueblo del Niño
Corea	Río Abajo	Mata de Plátano
Collores (Bo. Santa Olaya)	Santa Teresita	Río Chiquito
Barrio Nuevo	Comunidad San José (Laberinto)	Sector Fortuna Playa
VansCoyDajaos	Cuyón	Cerro Gandía
El Chícharo	Río Jueyes	Cerro Quiñones
El Volcán	Barriada Zambrana	El HornoBarrio Llanadas
La Cambija	Parcelas Seguí	El 30 (Sector Los Mercados) en Barrio
La Caridad	Barriada Ferrer	Indiera Alta
Los Viejitos	La Línea	La Cuchilla
Papito	Candela	Los Cuadros-Montoso
Punta Brava	La Milagrosa	Villa Esperanza
Ballajá	Río Abajo	Bo. Calzada, Sector Batey Columbia
Colacho	Santa Teresita	Matuya BajoLa Playa
Hoyo Bravo Buena Vista	Comunidad San José	Bo. Talante, Sector García
Dulces Labios	(Laberinto)Trastalleres	La ChorraPolvorín
Río Hondo	Quebrada Grande	Felices Días
	El Maní	BalboaBarrio Salud
		Mayagüez Arriba
		El QuemadoRío Cañas
		La Quinta
		Central Igualdad
		Leguízamo
		Rosario

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Appendix B
Case Studies

An important aspect to understanding the scope and expected results of our project is to review the results of other recent community development programs conducted throughout the world.

Alexandra

The township of Alexandra, South Africa is approximately 2,000 acres, and is home to about 350,000 people. There are about 4,000 buildings here that are well-constructed, but very old, and in addition there are an estimated 34,000 shacks or informal dwellings (City of Johannesburg, 2002). When Apartheid was abolished in South Africa, many thousands of people came from the rural areas of South Africa and neighboring countries to Alexandra to look for jobs in the nearby city of Johannesburg. This influx of people strained an already rudimentary infrastructure and the living conditions in this community became dangerous and unhealthy. Sewers constantly overflow, water pressure is extremely low, electrical connections are poorly constructed and extremely dangerous, and health problems run rampant. The Alexandra Project, a partnership between local and national government, was created to establish a healthy living environment in order to improve the community.

Over the next seven years of implementation, the Alexandra Renewal Project hopes to reduce unemployment by twenty percent, reduce crime by fifty percent, improve the government services offered to residents, clean up the pollution that exists throughout the township, relocate or upgrade informal settlements, and create a sustainable and proud community identity in Alexandra. The primary focus of this project is the upgrading of infrastructure, which includes: improvements to roads, the electric grid, street furniture, open spaces and cemeteries, the enforcement of health and environmental standards, and the creation of low cost quality housing to residents through the revitalization of existing structures, and the construction of new housing units. Within the first year of the program, seven thousand families who lived in a flood plain near the Jukskei River have been relocated and moved out of slum housing into safer and well constructed permanent homes. The river banks were then cleared of debris, and reinforced with grasses. Not only are these people no longer at risk during floods along the river, but the environment has been greatly improved, as pollution in the river in terms of fecal matter has gone from 1.6 million parts to under 70,000 parts. A focus on: infrastructure improvement, strong community support, a well defined strategy, adequate funding, and government cooperation are all coming together to create a successful community renewal program in Alexandra, South Africa.

Caracus

Venezuela has a population exceeding 22 million people with over ninety percent of the population living in urban areas, making it the most urbanized country in Latin America. The vast majority of urban dwellers, over seventy five percent, are impoverished (Project Information document). The average per capita income in Venezuela for 2001 was $4310 (The Europa, 2002). Starting in 1998, with World Bank funding of $150 million, the national government of Venezuela and the local

communities in Caracas have been working to improve the conditions in the city's slums (World Bank, Urban Upgrading). Several "barrios" (informal settlements) were identified to receive assistance through this program. About forty percent of Caracas's population lives in barrios and all previous attempts to clean up this poverty have been largely unsuccessful, despite significant investments from the central and local governments (Soonets, 2000).

There are three main objectives for this project. The first objective of this project is to improve the quality of life for those residents of the barrios selected for improvement, and in doing so, set a model for other slum improvement projects to follow in Caracas. Objective Two is the promotion of community support and participation in the project. The final objective for the project is to create a community sized development unit to oversee the project.

The objectives are addressed by a program which is made up of three main components. The most important component is entirely composed of physical improvements and involves: the design and installation of pedestrian and vehicular access, improvements to the water distribution system, improved sewage and sanitation systems, safe electricity distribution, increased public lighting, the construction of community centers and construction of safe affordable housing. The second component includes: the funding of a project management unit which will monitor, evaluate, and provide technical assistance to the project. The third component is the issuance of micro-loans to residents of these informal communities so that they can finance improvements to their own homes (The World Bank Group, January 22, 2003). The two improvement districts chosen for theses project have a total of almost two hundred thousand inhabitants. This project strives to improve the basic infrastructure of these communities, which will encourage the people of Caracas to organize their resources and improve themselves through sustainable community redevelopment.

Appendix C
Original CSA Field Assessment Form

CSA Group, Informe de Campo
Comunidades Especiales
Comunidad:

Special Communities
Field Study Compilation Sheet

Date of visit:		Municipality:		Number of people:	
Date of form:		Physical Address:		Number of residencies:	
Author:		Community:		Number of Streets:	
DTOP Representative:		Community Leader Contact:		Other:	

Complete this form using the following categories. Is there? = Y (Yes), N (No). Condition = E (Excellent), G (Good), S (Satisfactory), D (Deficient)

- Inventory of Existing Facilities – Engineering

	Any?	Condition	Comments	Streets that need
1. Community Access				
2. Streets				
3. Sidewalks				
4. Sewer System				
5. Water Sevice				
6. Sanitary System				

1 of 10

	Any?	Condition	Comments	Streets that need
7. Pedestrian/Vehicle Access to areas within the Community				
8. Identify fire hydrants and areas with out water services in case of fire				
9. Electrical Services to residents in public areas				
10. Transportation service AMA or other				
11. Telephone service				
12. Cable TV u other				
13. Sewer drains				
14. Street Lights				
15. Transportation				
16. Land within a community that can be used to construct community facilities				
17. Wetlands in these lands of possible construction				
18. Condemned Housing				
19. Archeologically sensitve areas				
20. Work or possible work in				

	Any?	Condition	Comments	Streets that need
navegatable federal waters				
21. Others				

- Inventory of Existing Facilities – Architecture

	Any?	Condition	Comments	Streets that need
22. Soccer Field				
23. Community Center				
24. Schools				
25. Health Centers				
26. Houses in appropriate conditions				
27. Available land				
28. Recreational Areas				
29. Ornament				
30. Any factor with visual impact to the community				

• Identify types of homes (Approximately)
  ○ Individual Homes
  ○ Lots
  ○ Apartments.
•				

	Any?	Condition	Comments	Streets that need
• Type of construction Wood Concrete				
Neighborhood Facilities for recreation Passive Recreation Park Plaza Meeting area				
Active Recreation/Sports Basketball Soccer Others 31.				
• Community Facilities o Community Center o Library • Facilities where residents associate				
• Basic Services o Small commercial Stores o Pharmacy o Other o Headquarters 32.				
33.				

	Any?	Condition	Comments	Streets that need
34.				
35.				
36. Others				

- Impressions of the Residents and Leaders

	Any?	Condition	Comments	Streets that need
37. Problems with floods and sewage overflow				
38. Entry and Exit river flow for the community in morning and night				
39. Any buildings annouced by the municiple for the community				
40. Any imporvements promised by government officals				
41. What imporvements must be made for the community (by priority)				
42. Others				

Graphic Evidence:

- **Take photos in each community by street**
- **Photos by street: cross-sectional, major problems, points of interest**
- **White background where you can number the photos with dates**

- Imporvement suggestions (by order of priority)

Technical Complexity = 1 (Major, significant complexity), 2 (Very complex, requires design, specifications, etc.), 3 (Easily fixed with simple design and brief specifications), 4 (Requires constuction permints and endorsments), 5 (Doesn't require permits, endorsements, or enviornmental documents).

Type of permit = 1 (Extensive, requires Declaration of Enviornmental Impact), 2 (Moderate, requires Enviornmantal Evaluation), 3 (Simple, requires exclusive categories and does not have significant impact), 4 (Simple Construction and easy implementation).

Short Term	Actual Condition	Area of Impact	Technical Complexity	Type of Permision Required	Estimated Cost	Estimated Design Time	Estimated Type of Constuctio n	Order of Implem enation
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								

Short Term	Actual Condition	Area of Impact	Technical Complexity	Type of Permision Required	Estimated Cost	Estimated Design Time	Estimated Type of Constuctio n	Order of Implem enation
10.								
11.								

Intermediate Term	Actual Condition	Area of Impact	Technical Complexity	Type of Permision Required	Estimated Cost	Estimated Design Time	Estimated Type of Constuctio n	Order of Implem enation
12.								
13.								
14.								
15.								
16.								
17.								
18.								
19.								
20.								

Intermediate Term	Actual Condition	Area of Impact	Technical Complexity	Type of Permision Required	Estimated Cost	Estimated Design Time	Estimated Type of Constuction	Order of Implementation
21.								
22.								

Long Term	Actual Condition	Area of Impact	Technical Complexity	Type of Permision Required	Estimated Cost	Estimated Design Time	Estimated Type of Constuction	Order of Implementation
23.								
24.								
25.								
26.								
27.								
28.								
29.								
30.								
31.								

Long Term	Actual Condition	Area of Impact	Technical Complexity	Type of Permision Required	Estimated Cost	Estimated Design Time	Estimated Type of Constuction	Order of Implementation
32.								
33.								

Have you identified all the community necessities?	
Are the identified improvements going to have positive impact on the quality of life of the community in the short and intermediate phase?	

- Additional Comments:

- Insert Photos (with descriptions as far as which they try to demonstrate):

Appendix D

Juan Collazo's Field Assessment Form

		COMUNIDAD ESPECIAL																	
		PUERTO RICO																	
															ESTUDIOS	ESTUDIOS REQUERIDOS			
NUM.	NOMBRE DE CALLE	TOTAL	UNIDAD	UNIDAD	HAY	HAY	HAY SIST.	HAY SIST.	HAY SIST	HAY SIST	HAY BOCA	HAY	SISTEMA	(additional studies needed)					
		CASAS	2-NIVELES	MADERA	ENCINT.	CUNETA	ACERA	PLUVIAL	SANIT.	AGUA	INCENDIO	LUMINAR.	ELECT.	TOPO	H/H	ARQUEO.	SANITAR.	ARQUIT.	
	(translation)														hydrology	archeoligical		architec	
NO.	street name	total #	2 level	wooden	have	have	have	storm	santary	water	have fire	have	how is the		hydrailiic		sanitary	tural	
		of houses	units	units	curbs ?	ditches?	sidewalk?	sewer syst	sewer syst?	system?	hydrants	light poles	elect. Syst.						

Appendix E
First Iteration of New Special Communities Assessment Form

		COMUNIDAD ESPECIAL																		
		PUERTO RICO						General Information Section							Measurements		Additional Studies Section			
NO	Street Name	total # of houses	2 level units	wooden units	have curbs ?	have ditches?	have sidewalk?	Paved Streets?	storm sewer syst.	santary sewer sys	water system?	have fire hydrants	have light poles	how is th elect. Sys	Street Measure	Sidewalk Measure	TOPO Topo	H/H hydrology hydrailic	ARQUEO archeoligical	SANITAR. sanitary	ARQUIT architec tural
1																				
	Condition(% damaged)																			
2																				
	Condition(% damaged)																			
3																				
	Condition(% damaged)																			
4																				
	Condition(% damaged)																			
5																				
	Condition(% damaged)																			
6																				
	Condition(% damaged)																			
7																				
	Condition(% damaged)																			
8																				
	Condition(% damaged)																			
9																				
	Condition(% damaged)																			
10																				
	Condition(% damaged)																			
11																				
	Condition(% damaged)																			
12																				
	Condition(% damaged)																			
13																				
	Condition(% damaged)																			
14																				
	Condition(% damaged)																			

Appendix F

Second Iteration of New Special Communities Assessment Form

Name of Community:														Date:
CSA Group		Name	Condition (% Damage)	Name	Condition	Name	Condition	Name	Condition	Name	Condition			
General Information	Total # of houses													
	2 Level units													
	Wooden units													
	Have curbs?													
	Have ditches?													
	Have sidewalks													
	Storm sewer sys.													
	Sanitary sewer sys.													
	Water sys.													
	Have fire hydrants													
	Have light poles													
	How is the elec. sys?													
	Paved street													
Measurements	Street measurement													
	Sidewalk measure													
Other Studies	Topo													
	Hydraulic													
	Archeological													
	Sanitary													
	Architectural													
Pic #														
Notes														

Name of Community	
Location of Problem	
Problem Description	
Impact of Improvement on Community	
Design Time Required	
Constuction Time Required	
Future Surveys Needed	
Measurements	
Technical Assumptions	

Appendix G
Third Iteration of New Special Communities Assessment Form

CSA Group, Informe de Campo
Comunidades Especiales
Comunidad:

Special Communities
Field Study Compilation Sheet

Date of Visit:	
Date of Form:	
Author(s):	
DTOP Representative:	
Municipality:	
Community:	
Community Leader Contact:	
Number of People:	
Number of Residencies:	
Number of Streets:	

Field Assessment Form

Name of Community:				Date:
Name of Street:				
	Catergory	**Amount**	**Condition**	**Comments, Description and Location**
Streets	Street measure			
	Sidewalk measure			
	Paved			
	Curbs			
	Storm Drains			
	Sidewalk			
	Hydrants			
Housing	Total #			
	Livable: Occupied / Vacant			
	Unlivable: Occupied / Vacant			
	Material Type (wood, concrete)			
	Building Type (single or two story)			
	Cable Service			
	Phone Service			
Land	Available			
	Owner			
	Types of Vegetation			
	Size			
Utilities	Storm sewer sys.			
	Sanitary sewer sys.			
	Water Services			
	Have light poles			
	How is the elec. sys?			
Photo Reference Number				

General Assessment Form

Name of Community:				Date:
	Yes or No	Location	Condition	Comments/Description
Public Transportation				
Hospital / Health Center				
School				
Recreational Areas				
Small Stores / Businesses				
Archaelogical				
Endangered Species				
Environmental Issues (Wetlands, etc.)				
Public Spaces				
Community Center				
Federal Water Ways (Canals, etc.)				
Churches				
Other				

Major Problem Area

Name of Community:	Date:
Circle Problem Area	Electricity Housing Sanitation Roads Drainage Vegetation Public Facilities Public Areas Other:
Location of Problem	
Problem Description	
Impact of Improvement on Community	
Design Time Required	
Construction Time	
Future Surveys	
Cost Estimate	
Permits	
Technical Description	
Recommendations	

Appendix H
Final Iteration of New Special Communities Assessment Forms

CSA Group, Informe de Campo
Comunidades Especiales
Comunidad:

Special Communities
Field Study Compilation Sheet

Date of Visit:	
Date of Form:	
Author(s):	
DTOP Representative:	
Municipality:	
Community:	
Community Area (Acres or Meters):	
Community Leader Contact:	
Number of People:	
Number of Residencies:	
Number of Streets:	
Promoter Name / Contact Info:	

Street Assessment Form

Name of Community:				Date:
Name of Street:				
	Category	**Amount**	**Condition**	**Comments, Description and Location**
Streets	Street measure			
	Sidewalk measure			
	Paved			
	Curbs			
	Storm Drains			
	Sidewalk			
	Hydrants			
Housing	Total #			
	Livable: Occupied / Vacant			
	Unlivable: Occupied / Vacant			
	Material Type (ex. wood, concrete)			
	Building Type (single / two story)			
	Cable Service			
	Phone Service			
Land	Available			
	Owner			
	Types of Vegetation			
	Size			
Utilities	Storm sewer sys.			Note connection points
	Sanitary sewer sys.			Note connection points
	Water Services			Note connection points
	Have light poles			
	How is the elec. sys?			
Photo Reference Number				

General Assessment Form

Name of Community:			Date:
	Yes or No	Condition	Comments / Description
Public Transportation			
Location			
Hospital / Health Center			
Location			
School			
Location			
Community Center			
Location			
Churches			
Location			
Recreational Areas			
Location			
Public Spaces			
Location			
Small Stores / Businesses			
Location			

Suggested Projects/Solutions

Name of Community:	Date:
Circle Problem Area	Electricity Housing Sanitation Roads Drainage Vegetation Institutions Public Areas Other:
Location of Problem	
Technical Description	
Solution Description	
Permits	
Cost Estimate	
Impact of Improvement on Community	
Design Time / Construction Time Required	
Future Surveys	
Recommendations	

Resident Comments

Community:		Date:				
Name	**Contact Info**	**Comment Concerning what Problem Area?**				
		Electricity	Housing	Sanitation	Roads	Drainage
		Vegetation	Institutions	Public Areas	Other:	
Comment						
Name	**Contact Info**	**Comment Concerning what Problem Area?**				
		Electricity	Housing	Sanitation	Roads	Drainage
		Vegetation	Institutions	Public Areas	Other:	
Comment						
Name	**Contact Info**	**Comment Concerning what Problem Area?**				
		Electricity	Housing	Sanitation	Roads	Drainage
		Vegetation	Institutions	Public Areas	Other:	
Comment						
Name	**Contact Info**	**Comment Concerning what Problem Area?**				
		Electricity	Housing	Sanitation	Roads	Drainage
		Vegetation	Institutions	Public Areas	Other:	
Comment						
Name	**Contact Info**	**Comment Concerning what Problem Area?**				
		Electricity	Housing	Sanitation	Roads	Drainage
		Vegetation	Institutions	Public Areas	Other:	
Comment						

Appendix I
CSA's Lessons Learned

Lessons Learned, 02PR034C01
Compilation of Comments, 3/11/2003 Meeting

This is just a compilation of all suggestions. The Project Manager will later distribute a set of instructions for the next phases incorporating some of these comments.

What We Did Well

Committed team
Good communication with team and client (DTOP) (could be improved by explaining scope and expectations better)
Worked efficiently
Early submittals
Paid attention to budget
Proactive with problems
Visited team member desks
Involvement of Dept. Managers
2 people teams worked well
Photo album program saved time (only used by one team because company does not have it yet)
Did not do unnecessary tasks
Standard estimate lists (should be more extensive)
Get blue prints from Vivienda, municipalities (planos de segregacion, cuadrangulos)
Get information on street names etc. from police or other authorities
One team goes to field while another finalizes report
Have community leader phone numbers to coordinate meetings
Have community meeting notes before going to the field
Technical QC of report by various people
Involving experienced engineers (like Collazo and Galib) in cost estimating
Talking with residents during field visit
Mark photos on map

What We Need to Improve

Report Writing

Do technical analysis (maybe with Technical Manager) before writing report and after field visit
Attention to detail (right municipalities, spelling, etc.)
More specific on technical issues
Include more technical info
Create standard descriptions, estimates and permit lists for courts, storm sewer, pavement, sidewalks, lamp posts, hydrants, storm sewer and sanitary systems
Include all photos and their captions in a Word document
Reorganize estimate and improvement plan sections (include section on what DTOP chose to suggest to community, prioritize by importance but include note on budget or time constraints)
Include grid by street
Pair of clear eyes for final read through
Insist on written client (DTOP) comments before final
Include aerial photos
Include some kind of broad sketch of community with suggested improvements
Report should be reviewed by field team before submittal

Define standard format and process for report writing

QC for language and uniformity between reports

Include assumptions

Field Work

Request written feedback from promoter before field visit (street names, community limits, priority issues, houses with special needs, current projects)

Analyze graphic material ahead of time (topographical maps, flood maps, aerial photos). Scale of 1:20,000 to 1:10,000

Prepare table with street names ahead of time

Make changes to data form to include measurements (street, sidewalk length/width), quantities (lamp posts that need replacement or repairs, hydrants, houses)

Focus on water management (storm, sanitary), storm sewers, pavement, courts

Measure streets (come up with measurement system)

Buy measuring mechanism (tape wheel or electronic)

Buy simple measuring tape for each team

Specific info (measurements, street names, house #s)

Identify streams, barrancos on maps

Have regulations handy (hidrants, etc.)

Take pictures for perspective as well as for technical purposes

Obtain GIS info or aerial photos from municipality or our GIS (inhabitants by age and gender, number of streets, number of houses, community limits)

Do first a general visual review and then a specific review of critical areas.

Take vegetation pictures (to ascertain endangered species)

Maybe get endangered species in area from our department of Environmental Sciences?

Take note of cases that may require immediate attention (people living in dire conditions, etc.)

Define level of specificity for each type of information

Come up with list of standard assumptions or questions to be answered for each type of project/cost estimate

Find out if Comunidades Especiales is exempt from any permits, etc.

Logistics

Assign Technical Manager

Assign PDM's with job descriptions

Make contact list

Field Team: Day for field work, day for analysis, day for report writing

Do basics before going to field (assemble and analyze all notes, maps)

Find out information that Oficina de Comunidades Especiales may already have

Allow 2 hours for final edit

Allow time to print

Maybe provide small training on how to do assessment and improvement plan for team

Consult electrical engineer on improvement plans in case of pumping station or other projects requiring electricity?

Administrative

Better define scope with client (DTOP)

Better communicate scope and processes to team

Define billing/collection process within DTOP with client ahead of time

Do minutes before going to field

Change electronic file index

Tell team where to place specific documents in file

Do preliminary in black and white
Do template for note taking
Pay attention to details
Purchase photo album software
Come up with process for finding out current projects or other info from government agencies
Aerial photos can be purchased on floor 7 of DTOP building

During Design and Construction

Define prototype designs (courts, community centers, park elements)
Define required studies (survey –lambert, local, H/H, Soil, topography)
Define risk that may be assumed by CSA (codes, studies prior to design)
Define permits and endorsements required (no permits, environmental permits or complete agency permits)
Define bidding documents (packet by community – one or various, or packet by municipality or area)

Appendix J
DTOP's Outline for Final Evaluation Report

DTOP Outline for Final Evaluation Report

1. Introduction

2. Summary
- General condition of the Special Community
- Photographic documentation
- Number of inhabitants and structures
- Necessary improvements
- Considered of cost for improvements

3. Location
- Type of community
- The municipality
- Adjacent areas
- General topography

4. Description

4.1. Size
- Territorial extension
- Information of census
- Amount of streets
- Amount of residences

4.2. Urban Form
- As it is organized physically

4.3. Uses
- Residential, commercial, industrial

4.4. Structures
- Construction equipment
- Levels and general condition

4.5. Vegetation
- Which Types

5. Physical training conditions

5.1. General
- Scale in the survey (Excellent, good, satisfactory, deficient)
- Condition of spaces public, versus residential

5.2. Infrastructure

5.2.1. Roads
- Street Condition
- Accesses A.M. and p.m.
- Impact during storms? (Flood, etc.)
- Transportation
- Needed streets
- Commentaries of residents on the matter

5.2.2. Electricity
- Condition Lights
- Condition on watch
- Needed streets
- Commentary of residents on the matter

5.2.3. Potable Water
- Condition on watch
- Needed streets
- Commentary of residents on the matter

5.2.4. Sanitary System
- Condition/Comment of sanitary system
- Needed streets
- Commentary of residents

5.2.5. Sewage Systems
- Condition and commentary pluvial sewage system
- Service of sewage systems
- Needed streets
- Commentary of residents

5.2.6. Vegetation
- General commentary

5.3. Houses
- General condition of houses
- Inhabitable houses
- Needed streets
- Commentary of residents

5.4. Institutions
- Condition and commentary of schools
- Condition of health centers
- Commentary of residents

5.5. Spaces Public
- Condition/Comment of ballpark
- Condition/Comment communal center
- Condition/Comment of relaxation areas
- Condition/Comment of scenery
- Archeological sensitive areas
- Federal fairways
- Needed streets
- Commentary of residents

6. Plan of Improvements

6.1. Short Term

6.1.1. Improvement
- Description (scooping) (if it includes construction, availability of land and wetlands in that area)
- Impact
- Technical complexity
- Type of permissions
- Considered cost and time

6.2. Medium Term

6.2.1. Improvement
- Description
- Impact
- Technical complexity
- Type of permissions
- Considered cost and time

6.3. Long Term

6.3.1. Improvement
- Description
- Impact
- Technical complexity
- Type of permissions
- Considered cost and time

7. Considered of Cost

7.1. Improvement

7.1.1. Total

7.1.2. Design

7.1.3. Inspection

7.1.4. Construction

Appendix K
Field instruction sheet for field architects and engineers

Introduction

These instructions are divided by the individual Field Sheets. The intent is to be able **to fill some parts** of the evaluation sheet out **before** the visit to the community so that you only have to validate the information on some of the fields. Please**, read these instructions** with care **before beginning** the evaluation… it will make life much easier for all. Please, fill in ALL the lines on the sheets, at minimum. Feel free to take additional notes that are necessary or important. The better observers you are, the better the final product will be.

Sheet	Use	When to Fill Out
1. Field Summary Sheet (1 page)	Write down very general information of the community from the field visit.	Most of this information can be filled out beforehand (based on maps) and speaking with community leaders.
2. General Evaluation Form (3 pages)	Describe in general the elements that are contained in the community that are not assessed on a street-by-street basis. The description should include the amount of each element, its location within the community and a description of the condition.	During field visit. Most of the information can be compiled by speaking with the community leader and in a general drive through of the community.
3. Street Evaluation Form (1 form for each street of the community)	Note dimensions, amounts and descriptions of found specific problems in each street. It is very important to take the dimensions from each street and sidewalks, as well as to notice measurements of sections where there is needed repair to the street or to the storm sewer. Also you should take photos and reference them for that particular street.	During field visit. You should take dimensions first and note the number of problems. Next you should note the appearance, necessities and take photos.
4. Community Leader and residents comments (however many pages needed)	We want to give life to the final report by citing residents and workers. Therefore, use this form to obtain different quotes. Along with the quote, a photo of who is talking would be ideal.	During field visit. If the opportunity arises.
5. Solutions or Project Suggestions (1 page for the identified project)	Describe proposed project solutions, to be used with the recommendations section of the report.	After field visit. Complete data analysis and generate recommendations. You will use standards for some projects and then these standards can be used as models.

Field Summary Sheet

Line	What to Include	Comment
Community	Name of the community	
Municipality	The municipality of the community	Be careful, make sure not to put a neighboring municipality
CSA Field Team	Names of the CSA employees going to the field	
Date of the visit	When the community is visited	
DTOP Representative	Name of governmental employee who accompanies the team on the visit. If he is somebody of the municipality, please clarify.	
Promoter/ Contact Info	Name of the community promoter (employee of the central Special Communities Office) and his telephone number	
Community Leader/ Contact Info	Name of the Community Leader and his telephone number	
Number of Residencies	Number of residencies of the community	You can get this by asking the leader or promoter. Also it is possible to obtain the number of residences by the number of average people by houses in the zone (provided by the federal census).
Number of Residents	Number of residents of the community	You can ask and validate by making a count by street.
Number of streets	Number of streets of the community. Include alleys, branches, etc. Be sure to distinguish between these types.	You can get this information from maps and then validate in the field
Size of the Community	Measurement in meters or feet of the total designated area of the special community.	You can obtain from map.
Topography of Community	General topography of the area and if it is varied, describe where it varies.	You can obtain from map and then validate in the field.
General Description of the Community	Include if it is urban or rural, if the residents have property title, if it is of commercial/industrial or residential use, if it is clean, calm, if it has social problems, type of residents that are observed (old, families), brief history of its development.	You can ask and observe in the field

General Evaluation Form

This form presents a series of elements, write down the following: if they exist in the community, their location within the community, their condition and any observation necessary to describe characteristics, problems, and solutions in the closing report.

The format is equal for all the community elements, although some classified are not so pertinent as others.

1. Yes or No – Indicate if the element exists within the community and the amount.
2. Location – Where the community element is located.
3. Condition – Indicate generally what state the element is in. It does not help if there are no Comments and Descriptions.
   - E = Excellent
   - G = Good
   - S = Satisfactory
   - U = Unsatisfactory
   - D = Deficient
4. Comments and Descriptions – Describe the element so the DTOP can imagine it and sufficiently describe the problems in order to generate general solutions and cost/time estimates.

Line	What to Include	Comment
Community	Name of the community.	
Date of Visit	When the community was visited.	
Borders of the Community	What are the present limits of the special community? What are the north, the south, east and west borders?	Describe the borders in the Comments and Descriptions sections. “Yes or No", "Location" and "Condition" are not relevant.
Accesses/Transit	What are the access points to the community and how does traffic flow at these accesses and within the community (include if there are peak hours, etc) Condition: • E = Multiple safe accesses and the traffic can flow completely at any time or moment. • G = Multiple accesses (the majority of them are safe) and the traffic flows well except at some times during the day • S = Safe access and the traffic flows well except at some times. • U = Unsafe access and traffic flows with some problems during the day. • D = Total nightmare. Unsafe access and problematic traffic.	Write in "Location" of the accesses and put "Condition" of the road flow.
Public Transportation	If the community is served by public transportation, note where there are stops and what type of transportation	

Line	What to Include	Comment
	(busing, municipal trolley, student busing). Condition: • E = Multiple stops within the community. • G = One stop within the community. • S = One stop at the entrance of the community. • U = Some lines pass near the entrance. • D = Nothing.	
Public Areas/Scenery	Cleanliness of the land and shared spaces. Where are the problematic areas? Condition: • E = Free of trash and beautiful public areas (with plants, murals, statues, etc.). • G = Clean public areas with plants that are taken care of. • S = Majority of the public area is clean but with some sporadic problems. • U = Public areas that are not clean but they do not present risk to the population. • D = Dirty public areas that present risk.	
Recreational Areas	If there are zones of recreation, where are they located, what do they have, and what do they lack. Include fields, ballparks, tracks, children's parks, passive parks, assembly area, etc. Condition: • E = There is an indoor park, children's park, paths to walk, passive parks. Everything is well equipped with iron doors and lights that work. • G = There is an indoor park, children's park, paths to walk, passive parks. It can require some smaller repair. • S = There is no field with a roof, or children's park. It can require some smaller repairs and addition of passive parks, paths or roofs to the field. • U = There are some things, but it is in bad condition and it is necessary to add things. • D = None.	Mark on the map.
Community Centers	If there is communal center, where it is and in what physical conditions. Furthermore, describe additional necessities. Condition: • E = Excellent center, equipped well with books, computers, resources to look for jobs and with an	Take notice of size and or considered capacity.

Line	What to Include	Comment
	area for meetings and activities. It does not need repairs. • G = Good center, equipped well with books, computers, resources to look for jobs and with an area for meetings and activities. It needs some minimum repairs. • S = Good physical structure, with an area for meetings and activities. In needs some minimum repairs. • U = Acceptable physical structure, with meeting and activity area. It needs greater repairs. • D = None.	
Schools	If there are schools (including Head Starts, private schools), where they are and are their physical conditions. Condition: • E = Excellent schools for all the ages, well equipped and with sport facilities. They do not need repairs. • G = Excellent school in the community for a level. Other levels in neighboring communities. It needs some minimum repairs. • S = There are good schools in bordering communities and they are accessible. • U = The school of the community is in need of great repair. The schools in neighboring communities also need large amounts of repairs. • D = No schools in or close to the Community.	The average age of the children in the community, consider the necessity. For example, if there are many infants and there is no Head Start, that would fall under U.
Health Centers	If there are health centers (hospitals, medical clinics, offices, buildings of first aid). Condition: • E = Complete medical establishment within the community and it is in good condition. • G = Complete medical establishment near the community and some type of facility within the community and is in good condition. • S = Complete medical establishment near the community or some facility within the community that needs repairs. • U = Partial medical establishment near the community. • D = All the medical services are far away.	
Church	If there are churches, indicate what type and where.	
Businesses/Commerce	If there are businesses or commerce within the community, indicate what type and where.	

Line	What to Include	Comment
Federal Waters	If there is navigable canals, rivers or coast.	Use the map to see these areas and validate in the field.
Bodies of Water	Indicate if there are any bodies of water located in or near the community (including reservoirs). Give approximate names and dimensions Condition: • E = There has been no flooding within the last 100 years from rain. They are clean and do not need attention. • G = There has been no flooding within the last 10 years from rain. They are quite clean and require minimum attention. • S = They flood surrounding areas once a year and have some contamination that should be easy to remove. • U = They flood surrounding areas with some regularity and/or are contaminated with trash. • D = Serious and chronic problems. Severe contamination.	Use the map to see these areas and validate in the field.
Vegetation	How abundant and of what types.	It is possible to see on the maps and can be validated in the field. A guide to identify will be provided.
Species in Danger of Extinction	The aim is to find flora or fauna in danger of extinction and where they are located.	It is possible to see on the maps and can be validated in the field. A guide to identify will be provided.
Archeological Sensitive Areas	Write down if there are areas of archaeological interest (where there has been an indigenous community, cemetery or some other historical establishment).	It is possible to see on the maps and can be validated in the field through conversation with residents. Mark on the map.
Environmental Areas of Interest	Indicate if there are areas where there is environmental interest: drains, wetlands, garbage dumps, sectors contaminated by industrial unloading, etc. Describe area and the subject.	
Areas of Physical Risk	Indicate if there is some danger of sliding, landslides, highways in risk without barriers, etc. Indicate where and note sufficient detail so that the DTOP can visualize the danger and can take necessary measurements in order to estimate cost of solutions.	Mark on the map the risk zones.

Line	What to Include	Comment
Areas of Social Risk	Indicate if there are factors of social risk such as: drug points, high unemployment level or scholastic desertion, high level of crime, gangs, etc. Indicate where the sectors are and where is the closest police station.	Obtain conversations and observations with community leader.
Other	Include what is necessary	

Street Evaluation Form

You should have one sheet for each street. Some elements require dimensions and other amounts. Please include them.

Line	What to Include	Comment
Community	Name of the Community.	
Date	Date when visited.	
Name of Street	The name of the street or the identifier that it has been assigned. You should indicate if the street has a street sign or not.	
Street Dimensions	Include the length and width of the street. Specify if the width of the street changes in some sectors.	Meters should be used, since the measuring wheels are in meters.
Sidewalk Dimensions	Include the length and width of the sidewalk.	Meters should be used, since the measuring wheels are in meters.
Pavement	Include measurement and location if there is sector without paving or areas with potholes that need repaving. Make percentage estimates on the street covered with potholes. Condition: • E = Pavement is excellent, level, without potholes. Repairs not needed • G = Paved well in all the sections with potholes in less than 10% of the surface. Minimum repairs required. • S = Paved in all sections with potholes in between 10% to 30% of its surface. It needs extensive repairs. • U = Some sections are not paved or pavement contains potholes in more than 30% of its surface. In need of great repair. • D = It seems that a bomb fell and it is necessary to repave the entire street.	
Street / Sidewalk	Include measurement and location if there are sectors that do not have sidewalks, roads or areas with problems that need repair. Specify what the problem consists of. Consider the percent of sidewalk or road that requires repair. Specify if there is space for the sidewalk and/or road in the zones where there are none. Condition: • E = Excellent sidewalk / road, level, without problems. No repairs necessary. • G = Sidewalk / Road has less than 10% of flaws on the surface. Requires minimum repair. • S = Sidewalk / Road sections have flaws in between 10% and 30% on the surface. Extensive repairs needed. • U = Some sections do not have sidewalk / road or sidewalks /	

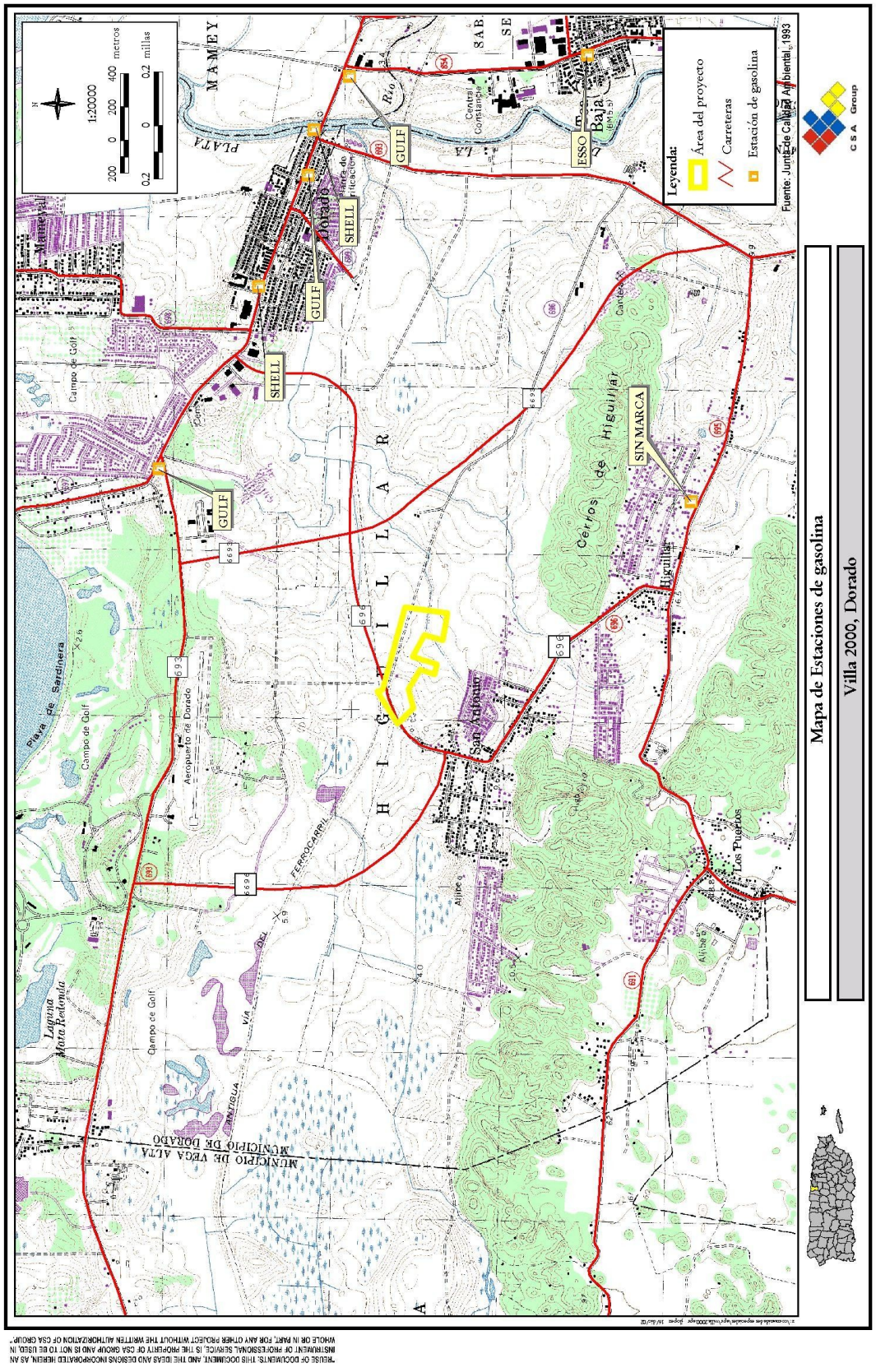
Line	What to Include	Comment
	road has flaws in more than 30% of the surface. Extreme repairs needed. • D = There is neither sidewalk nor road.	
Storm Sewers	Include measurement and location of the sector that does not have storm sewers or areas of storm sewers with flaws that need repair. Specify what the flaw consists of. Consider the percentage of storm sewers that requires repair. Specify if there is space for storm sewers in the areas where they do not already exist. Condition: • E = Storm Sewers excellent, controls run-off. No repairs needed. • G = Storm Sewers in all sections with flaws in less than 10% of them. Minimum repair required. • S = Storm sewers in all areas with flaws in between 10% and 30% of them. Redesign and extensive repairs require. • U = Some areas do not have storm sewers or have storm sewers with flaws in more than 30% them. In great need of redesign and repairs. • D = There are no storm sewers, although they are needed.	Obvious if there is storm sewage system, it is specified already. Record and watch water flow until it reaches its point of disposal and notice if it is the same as marked on the map.
Barriers	Include if they exists or if security barriers or another type of containment structure is needed. Measure the areas where they are needed.	
Fire Hydrants	Include whatever fire hydrants there are and if they are in good condition (that is, if they seem to work). However more might be needed according to regulations.	It should be 1 fire hydrant for every 150 meters.
Total Number of Houses	Include whatever houses are on the street. Condition: • E = All are concrete houses, clean with well-maintained porches. • G = The ample majority are concrete houses, and are well maintained. Only 10% or less require minimum repair. • S = Most of the houses are clean and are well maintained. Between 10 and 30% require repairs of some type. • U = Most of the houses do not seem to be well maintained, some are abandoned and more than 30% require repairs. • D = Almost all the houses are neglected and in a bad state.	
Inhabitable	The amount of houses, put the number of houses and the condition of occupied inhabitable over the number of houses that are vacant inhabitable. Note the location of the vacant inhabitable houses.	
Uninhabitable	The amount of houses, put the number of houses in the condition of occupied uninhabitable over the number of houses that are vacant uninhabitable. Note the location of these houses.	It is important to know who is living in impoverished conditions.

Line	What to Include	Comment
Construction Material	Note the number or percentage of houses that are constructed of wood, concrete, combination of the two or another material.	
Type	Note the number or percentage of houses that are 1 level, 2 levels, etc.	
Cable Service	Note if the street has cable service.	
Telephone Service	Note if some of the houses on the street do not have telephone service, if the service in the street is reliable, if there is a public telephone and if there is cellular signal.	Ask the community leader
Land Availability	This refers to available lands that are on the street and the possibility to acquire the land for recreational zone. You should note the amount of undeveloped lots, their size estimated in meters and a brief description.	You should take a photo of the available land.
Available Property	Note who is the owner of undeveloped property and to find out if he would be willing to sell it.	Ask the community leader
Vegetation	Briefly describe the vegetation of the street.	
Scenery	Note if there are areas that are full of trash, have abandoned cars, or graffiti on the walls. Condition: • E = Free of trash and beautiful public areas (with plants, murals, statues, etc.). • G = Clean public areas with plants that are taken care of. • S = Majority of the public area is clean but with some sporadic problems. • U = Public areas are not clean but they do not present risk to the population. • D = Dirty public areas that present risk.	
Sewer System	Provide dimensions where it is and where it is lacking. Notice points of connection, points of problems (covered culvert, etc.). It is necessary to be specific in order to propose exact solutions with costs. Condition: • E = There is buried sewer system in the entire community and works perfectly. Does not require repair. • G = There is sewer system buried in the most critical parts and there are storm sewers in the rest. It works well but it requires minimum repairs. • S = Buried sewer system or storm sewers that work but has problems of floods once a year. It requires some repairs by sector. • U = Partial system. There are floods regularly and the system requires extensive repairs.	

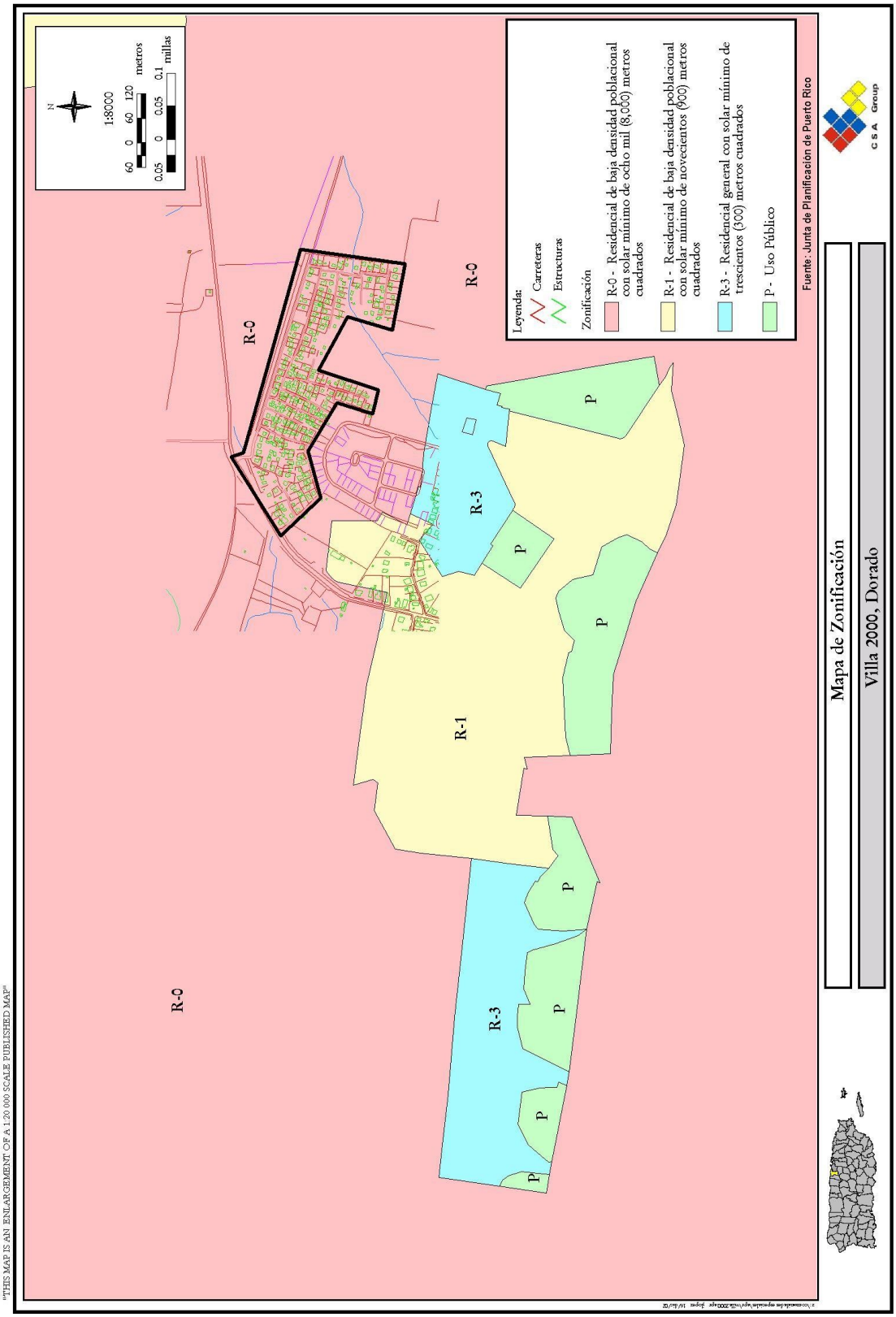
Line	What to Include	Comment
	• D = There is no sewer system.	
Sanitary System	Provide dimensions where it is and where it is lacking. Notice points of connection, points of problems (overflowing, etc.). It is necessary to be specific to be able to propose exact solutions with costs. Condition: • E = There is a sanitary system in all of the community and it works perfectly. Does not require repair. • G = There is a sanitary system in the majority of the community and is septic systems in the rest. It works well and it requires minimum repairs. • S = There are septic systems in the community and these work suitably. There is no sanitary system. It requires some repairs by sectors. • U = Only well systems exist. Few overflow and need immediate repair. • D = Disaster. Most of well systems are overflowing and require major repairs.	You should be specific with where there is overflowing as well as areas that need fixing.
Water Service	Note if the service of drinking water is reliable and if there are some houses that do not receive it. Identify and locate problems like: low pressure, intermittent service, cloudy waters, etc. Note connection points and note sources of problems.	Talk with the residents.
Electrical Service	Note if the electrical service is reliable and if there are some houses that do not receive it. Identify and locate problems like: fluctuations in voltage, intermittent service, damaged transforms, fallen cables, etc. Note source of problems.	Talk with the residents.
Street Lights	Note if the number of lights fulfills norms, whatever posts require repair, whatever lights require repair and how many additional posts are needed and lights that are lacking.	Regulation: 1 street light per 150 feet.
Photo Reference	Write down number identifier of photos taken on that street.	

Appendix L
GIS Map of the Aerial Photo Data Layer

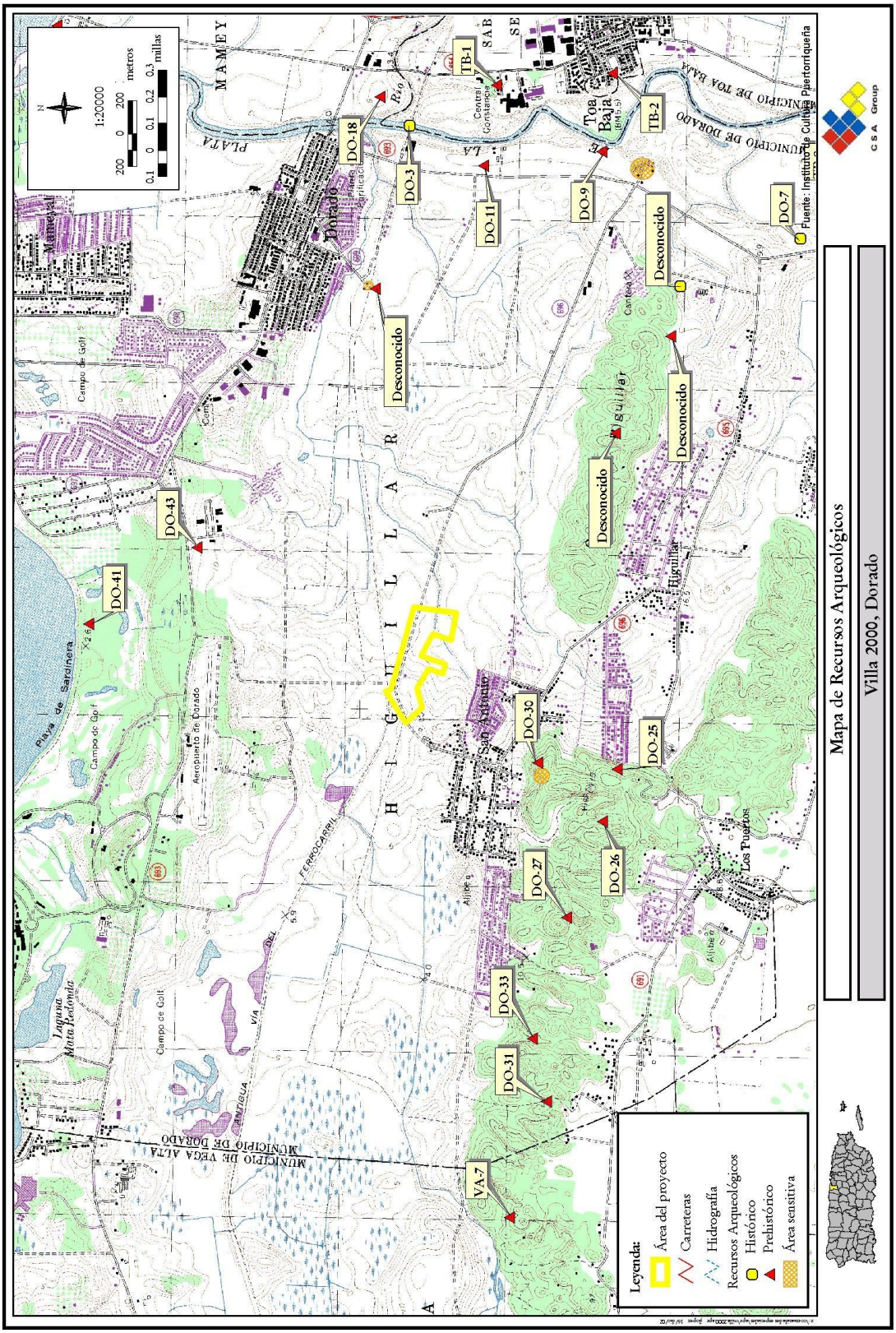
Appendix M
GIS Map of the Gas Stations Data Layer



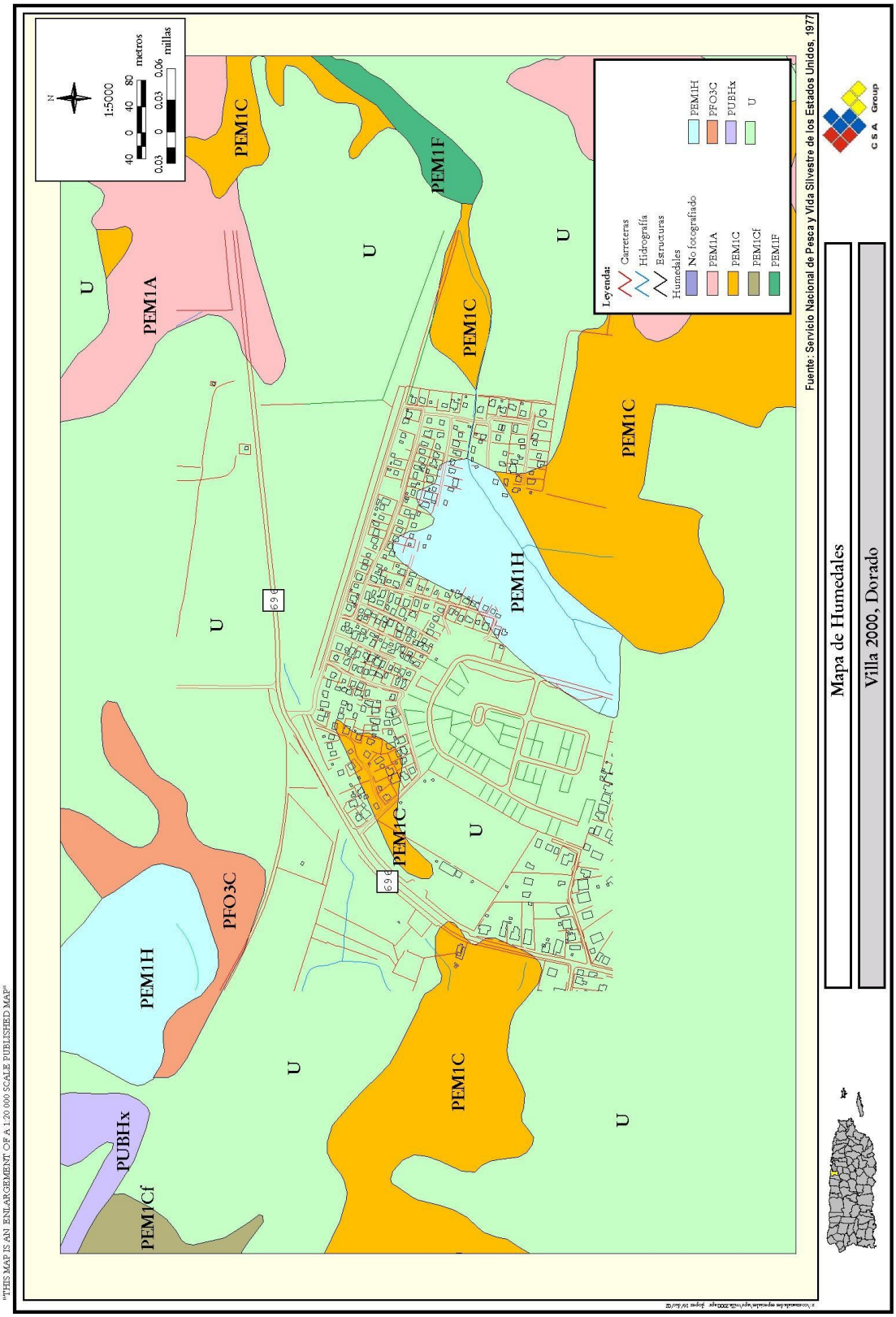
Appendix N
GIS Map of the Residential Zones Data Layer



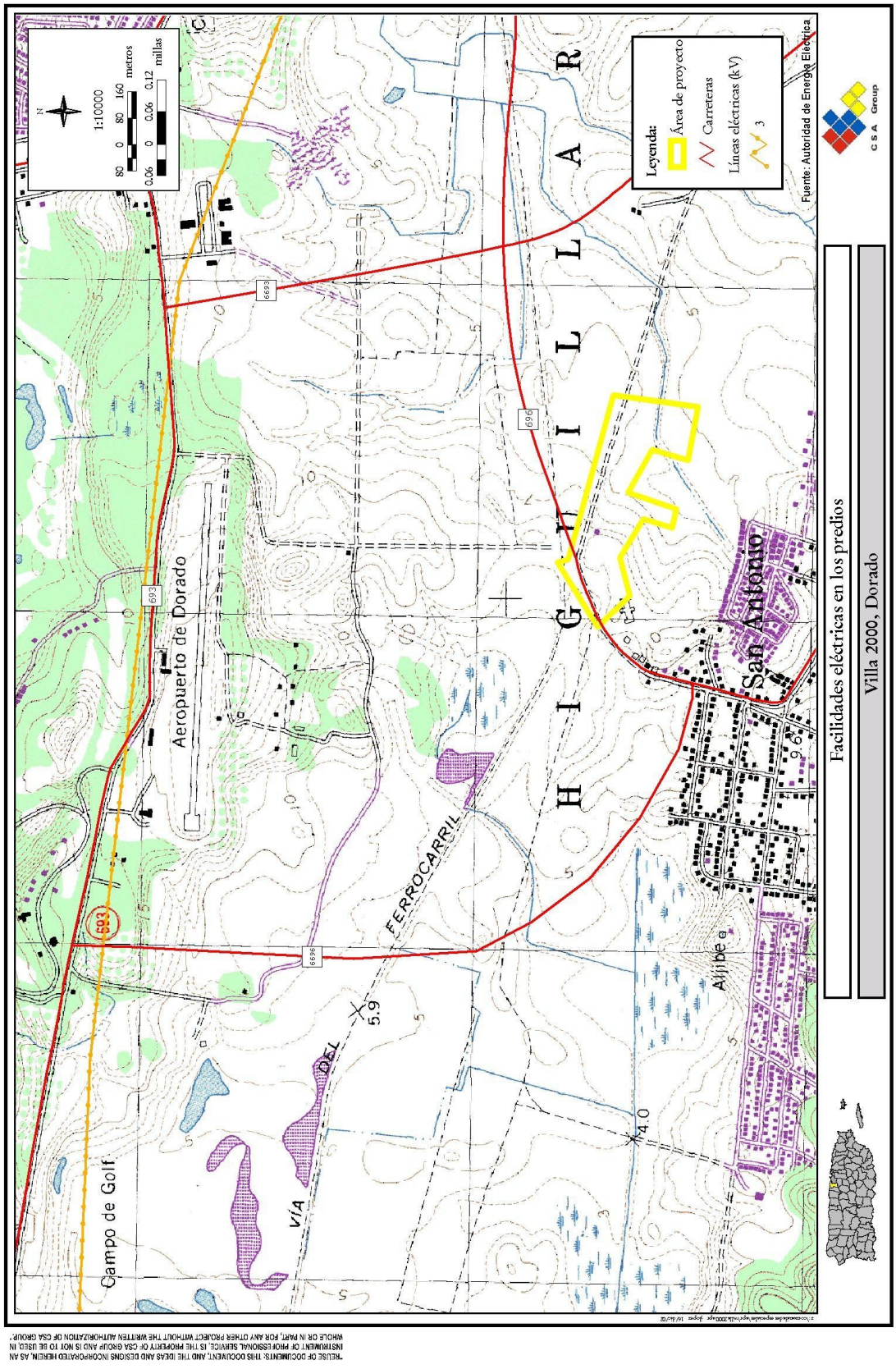
Appendix O
GIS Map of the Archeological Sensitive Sites Data Layer



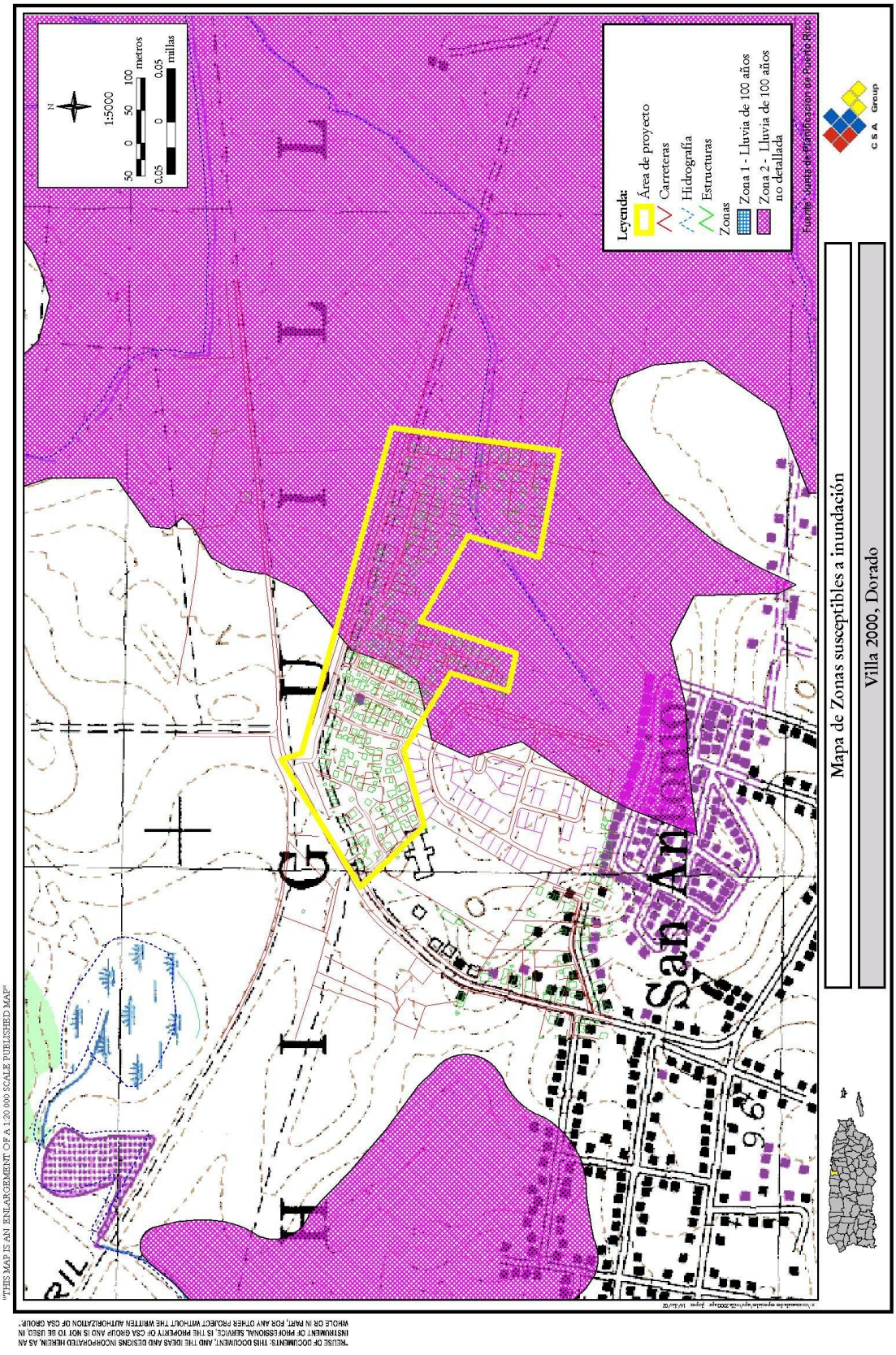
Appendix P
GIS Map of the Wetlands Data Layer



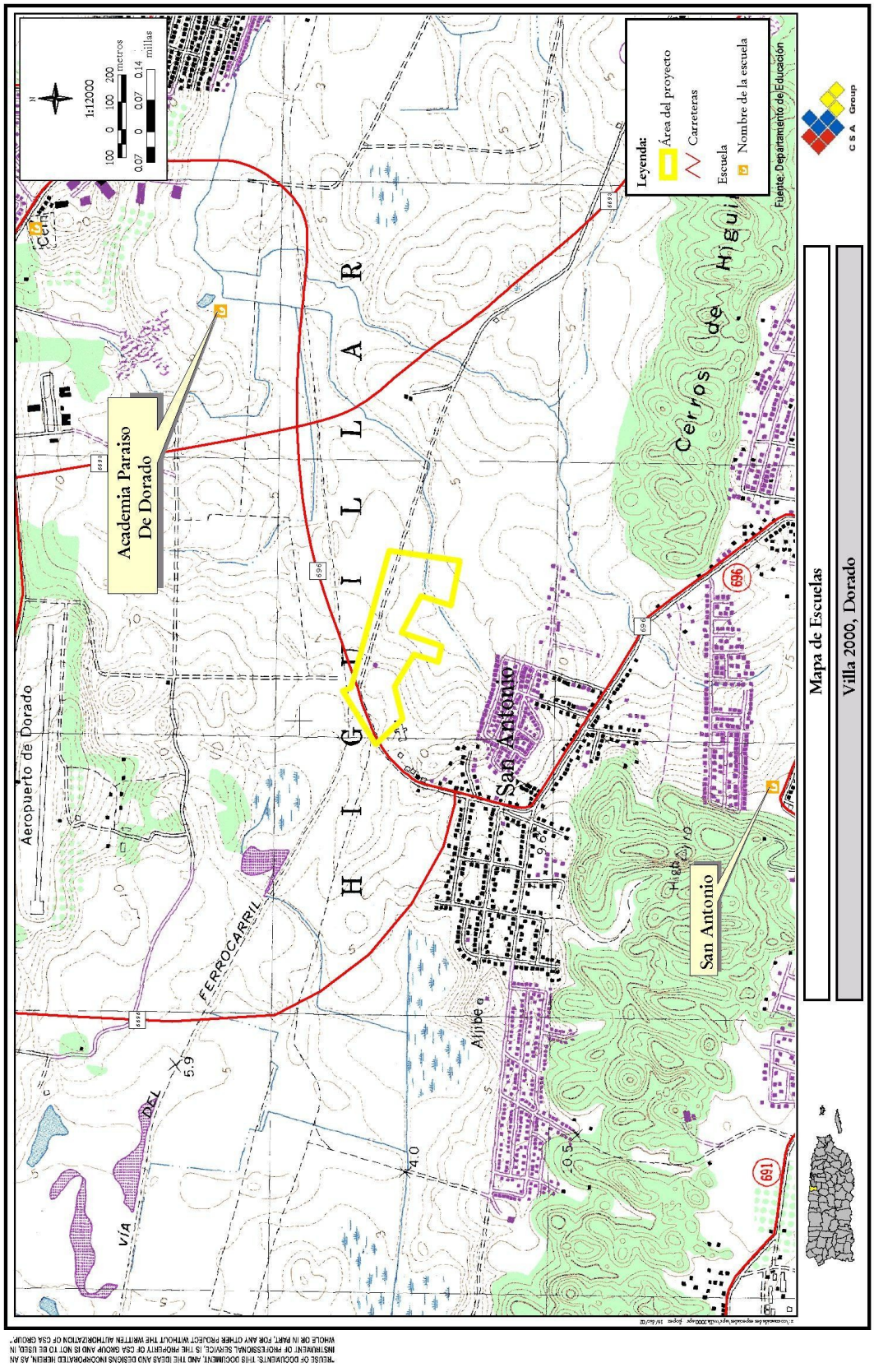
Appendix Q
GIS Map of the Electric Lines Data Layer



Appendix R
GIS Map of the Flood Zones Data Layer



Appendix S
GIS Map of the Schools Data Layer



Appendix T
GIS Map of the Water System Data Layer