

Relocation Options Assessment Handicapped Children’s Center

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1.0 Introduction

1.1. Scope of Work

A team from Engineering Ministries International (EMI) helped an agency evaluate several relocation options for a Handicapped Children's Center . EMI determined that the initially considered building was inappropriate for the agency's needs, and helped it locate and evaluate another building option that was more suitable for their work.

This report describes EMI's evaluation of and recommendations regarding both buildings, as well as detailing the anticipated future space needs of the relocated center and several new components. These new components include a school, medical clinic, physical therapy center, kitchen and dining facilities, and administrative/support services.

1.2. Ministry and Project Overview

The agency is a non-profit organization providing medical services, training and care to the less fortunate.

One of the agency's newer projects has been the operation of a Handicapped Children's home. The agency took over the operation of the home from the government in September of 1999, and reduced the new child, in-home mortality rate from 90% to 0%. As of June 2000, it cares for around 35 handicapped children 24-hours a day, seven days a week in the home. The home is currently located on the third floor of a government building approximately 45 minutes by car from the agency's home office.

The agency would like to find a new location for the home for several reasons. In reducing the children's mortality rate and the government's subsequent plans to entrust more children to their care, it is outgrowing the current facility. The existing home is also difficult for the child-care workers to access in the winter months because of bad road conditions. The agency would also like to provide better nourishment for the children, and needs their own kitchen facilities to do so.

In moving the home to a new site, the agency would also like to expand to become a comprehensive handicapped children's center, not just a home, able to provide the following:

- Round-the-clock care for 100 children
- Schooling and physical therapy for these 100 full-time children, as well as for up to 100 additional daytime handicapped children who could live off-center with their own families,
- Minor medical care for both full-time and day children,
- Meals for the full-time and day children and staff.

1.3. EMI Evaluation Team

The following design team from EMI visited the existing children's home and possible future sites for the new center from June 13-14, 2000:

Craig	Hoffman	EMI Project Development Coordinator. Civil/Structural Engineer	Colorado Springs	CO
Nicole	Gezon	EMI Intern -Civil Engineering	Colorado Springs	CO
Jennifer	Talmadge	EMI Intern - Electrical Engineering	Colorado Springs	CO

While these three people were visiting another design project, the agency met with Craig Hoffman on June 8, 2000 to discuss the possibility of sending a future EMI team to design the renovation of a new building once it was acquired. During that meeting, the agency invited Craig, Nicole and Jennifer to come immediately after their other project ended, to help evaluate the suitability of the building they were considering buying. EMI was able to comply.

EMI is an American non-profit organization whose mission is to mobilize North American design professionals to provide free design assistance to ministries in developing nations who are helping the poor and proclaiming the gospel of Christ.

2.0 Existing Children's Home

The agency's existing handicapped children's home is located on the third floor of a government building approximately 45 minutes from downtown. During the winter months, child-care workers have a difficult time reaching the home because of ice and snow on the roads and limited government resources to clear them. It is hoped that a new facility can be purchased, renovated and moved into before October 2000, when the winter weather begins.

The existing home consists of a set of rooms on either side of a hallway. Six or seven rooms are 'dorm' rooms, each one housing four to five children and a full-time caregiver. A care-givers stays with her 4-5 children for 24 hours, a second one stays for the next 24 hours, and a third one for the last 24 hours, then the first one returns to begin the cycle again. In this way, the children have a consistent set of 'parents' while these 'parents' are able to have their own families and lives outside of the home.

Additional caregivers come in during the day to augment the full-time caregivers care, and to provide special therapy and education for the children. Many of these daytime caregivers are from the United States and are able to stay for 1 week to 1 year.

On the third floor there are also four or five small rooms that are used for the home director's office, a breakroom for the 24-hour and daytime caregivers, and storage for toys, winter clothes, educational tools and books, and baby formula. The existing orphanage also has a communal bathroom with showers and toilets, which are difficult to keep clean because the children seem to take little ownership of public spaces.

There are some other facilities at the existing site, that are not on the third floor, but which the home uses and/or shares with other government groups. One of these is a central laundry facility that contains a washer with a spinner, an extra spinner, and a dryer. Two workers spend about 4 hours a day, 7 days week, washing clothes for the 35 children.

There is also a large 300-400 square meter, multi-purpose room on the first floor of the building that the home occasionally uses for children's performances and to host meetings for large groups visiting the home.

Government workers at another building on the site prepare the main meals for the children. These workers also prepare meals for a non-handicapped children's home at the site. The agency's home staff have tried to have the kitchen staff modify the meals to better nourish the children, but have had little success.

3.0 New Handicapped Children's Center Requirements

The agency hopes that the new center could be located closer to the downtown area where most of the full-time caregivers live and the agency offices are. It is also hoped that the center could move into this new location before the winter weather begins in October 2000.

The agency wants the new center to not only provide the same housing care as the existing home, but also education, minor medical care and physical therapy, kitchen and dining services. It will also need space for the required administration and support facilities. The following sections describe the requirements for these areas in more detail.

A detailed listing of the room area and furniture required for each of these components, as well as the number of 24-hour and daytime children and staff involved, can be found in the "Program Space Requirements" appendix. Below is a summary of these requirements:

	Space Required (sq mtrs)	24-hr kids	24-hr Staff	Day Kids	Day Staff
TOTAL	2221	100	21	100	62
a. DORMITORY	842	100	20	0	20
b. MEDICAL CLINIC and PHYSICAL THERAPY	244	0	1	0	5
c. SCHOOL	828	0	0	100	24
d. KITCHEN AND DINING	186	0	0	0	5
e. RECEPTION, ADMIN. and SUPPORT FACILITIES	121	0	0	0	8

3.1. Dormitory

It is desired that the new center's dormitory would function in a way similar to the existing home. Four to five children will have their own room with a set of three rotating 24-hour caregivers. There would also be 1 additional daytime caregiver per four to five children.

Changes from the existing home include a desire for slightly bigger dorm rooms, and more private locker space for each child. Also, private bathrooms for each dorm room are desired to promote ownership and cleanliness of bathrooms. Other details of the rooms required and their furniture can be seen in the "Program Space Requirements" appendix.

It is anticipated that 20 dorm rooms would be needed for the children if they were placed at five to a room, with six of the rooms being slightly smaller infant rooms. In addition to dorm rooms, space will be needed for support rooms such as storage, bathrooms and hallways.

This required area estimate was based on a dorm-style living arrangement similar to the existing home - the dorm room functioning as both a bedroom and living/family room. If a different arrangement is anticipated, such as in an apartment with smaller bedrooms and a common "living/family room", then the total space required and should still remain the same. And although the number of children and staff per apartment might change depending on the bedroom sizes, the total number of 100 children cared for, and twenty 24-hour staff required for their care, should also remain the same.

3.2. Medical Clinic and Physical Therapy

A medical clinic would be used to examine handicapped children hurt in falls and other minor accidents that occur frequently. It is hoped that a portable x-ray machine could be obtained and used in the clinic. Minor bumps and cuts could be treated in the clinic, and more serious cases could be sent to a local hospital.

The clinic would also have recovery rooms where children needing to recover from a hospital stay, or needing to be on an IV, could be kept with round-the-clock nursing care. Also needed is a medical isolation room where children that develop highly contagious diseases could be kept separate from the other children, while still receiving care and remaining close to home. A time-out room for children needing misbehavior correction and/or emotional isolation would be useful as well, although it does not necessarily need to be co-located in the medical section.

It is anticipated that a physical therapy center for physically disabled and/or recovering children would be located next to or within the medical clinic area. Through therapy at the existing home, the agency has taught 9-year old children to walk who had not walked for their entire lives. The

agency would like to have 3 physical therapy rooms, as well as a room with a small pool for hydrotherapy.

3.3. School

Handicapped children here are not educated in any formal process. Ignored by an educational system already strapped for resources, these children's education is left up to their parents, who are usually ill equipped to handle the special needs of their children. In many cases, this contributes to the children being abandoned to handicapped children's homes.

The agency wants to break this pattern of ignoring those with special needs by beginning a systematic education process that is flexible enough to accommodate children of widely varying needs. They would seek to teach children basic life skills, as well as basic scholastic skills, at a pace suitable to each child.

The agency wants to provide this basic education for not only the 100 children in their full-time care, but also for 100 additional handicapped children who are still living with their families. It is hoped that this will lessen the educational burden on those families, and enable those families to continue to be a home to their children. The agency would also like to begin a series of classes for those family members to learn how to better understand and care for their special-needs children.

So the school would need to serve up to 200 handicapped children. The class size would need to be kept small, perhaps three to four kids per class, because of the children's special needs. However, since special needs children's attention spans are usually short, the school day would be shortened to two hours. Consequently three two-hour school days could fit into one physical day, maximizing the number of students, and minimizing the number of classrooms needed to 20 (200 students / 3 to 4 per class / 3 classes per day = 16 to 22 classrooms). A fourth one to two hour shift could accommodate parent training classes mentioned above.

In addition, a large multipurpose room will be needed which would double as a gymnasium and as a meeting place for school assemblies and children's performances. They have done a few performances already which were well attended and inspiring to the audiences.

3.4. Kitchen and Dining

Central food preparation, storage and dining facilities will be needed for both the full-time children and staff, and for the day-time school children and support daytime staff. The most difficult meal will be lunch when all 200 children, 21 full-time staff, and 62 day staff would need to be fed.

To size the dining area, it is assumed that not all of the children would need to eat there because some will be infants; that the children that would be fed there would do so in three shifts of roughly equal sizes; and that some of the staff would eat in the staff breakrooms in the dormitory, school and medical areas. This results in a projected dining population of 75 people at a time. The dining area size should be more than adequate for this, allowing for the extra staff that would need to help feed some of the children.

Additional facilities needed for the food prep and dining areas are dishwashing and storage, food storage (frozen and dry), and two multi-person bathrooms.

3.5. Administration and Support Facilities

An area is needed for administration offices, reception of guests and visitors, and other support facilities such as a central laundry center. This would include a reception area, a small bathroom for visitors, an office for the entire center director with an attached private bathroom, an office for the center's financial officer, an office and storage area for the physical facilities director and the

central laundry area itself. Details of these areas can be seen in the Program Space Requirements Appendix.

4.0 Potential Building Evaluations

The following two options for the new center were evaluated. The building of Option 2 is actually the first building that EMI visited and evaluated on the afternoon of June 13, 2000. After determining that this building was inappropriate for the agency's new center, EMI helped it investigate the two buildings of Option 1. The agency had been interested in these Option 1 buildings months before but then had been told that they had been sold. However they were now available again. EMI visited and evaluated these two buildings the morning of June 14, 2000.

4.1. Option 1 - Buildings 1A and 1B

4.1.1. Building Description – Option 1

Option 1 actually consists of two buildings, 1A and 1B, as can be seen on the Site Map appendix. These two buildings sit on the corner of two streets, with a 4.5-meter setback from the North-South Street, and a 6.0-meter setback from the East-West street. The setback is protected from the street by a 2-meter tall block wall encircling the site. The layout of the ground floor and upper floors of Buildings 1A and 1B can be found on Appendices 4 and 5, respectively.

Building 1A is a four-story building with about 1,192 square meters of available space: 293 square meters on the ground floor, and 300 square meters on each of the upper three floors. The floor-to-ceiling heights are a spacious 3.4 meters on the ground floor, and 3.0 meters on the top three floors. The building looks as if it was designed to have large shops on the ground floor, and large offices with two bathrooms per floor on the upper three floors. There is a stairway in the northeastern corner of the building, with 1.8 meter-wide treads, servicing all four floors.

Building 1B is part of a six-story building. The portion available to the agency is actually the western-most 13.8 meters of the building, which abuts Building 1A. This portion of the building has about 1,064 square meters of available space: 231 square meters on the ground floor, and 167 square meters on each of the upper five floors. The floor-to-floor heights are about 3.5 meters on the ground floor and about 2.8 meters on the top five floors. It looks as if it was designed to have large shops, parking and storage on the ground floor, and two apartments on each of the top five floors. One apartment on each floor has three bedrooms, a bathroom and living room. The other apartment on each floor has two bedrooms, a bathroom and a living room. There is a stairway with 1.1-meter wide treads in the north center of this building that serves both apartments on each floor.

Both buildings are constructed with load-bearing concrete frames, where the internal walls only divide spaces, and do not actually bear any load. This makes the walls easier and safer to remove than if they were load bearing, although some analysis for lateral stability (wind and earthquake resistance) would have to be done to determine which walls can be removed.

4.1.2. Program Suitability – Option 1

Buildings 1A and 1B are very suitable for the components of the agency's new center, with a minimal amount of modifications. Building 1A was designed to be a commercial building and could easily be converted into an institutional building. Building 1B was designed as a residential building that could easily accommodate the needs of the home portion of the center.

The Children's home could be housed in the 2nd through 6th floors of Building 1B, which contain 833 square meters, just shy of the 842 square meters calculated to be required. Three of the five 2-bedroom dorms could accommodate 10 infants and two caregivers each. The other two 2-bedroom apartments could accommodate seven children and one to two caregivers each, and

the five 3-bedroom apartments could accommodate 11 children and two caregivers each. This yields a total of 69 children and 30 infants (99 total). The bathrooms in each children's apartment would have to be slightly enlarged to have two showers, two sinks and two toilets in each bathroom.

The Reception, Administration, and Support Facilities, the Home director's office, and a portion of the Medical Clinic (without the physical therapy rooms and office) would fit in the ground floor of Building 1B.

The Kitchen and Dining spaces, and remaining Medical Clinic portion (without the Physical Therapy Rooms), would fit in the first floor of the Building 1A.

The School and Physical Therapy Rooms would fit in the upper three stories of Building 1A. The Gymnasium would most likely occupy most of the second floor, where the bouncing of balls would only disturb the dining area below, and not any of the classrooms above. The gym would be broken up by all of the columns and some of the walls, which would have to remain. While this would make it difficult for a large performance area, it might be better for separate exercise areas with smaller number of children in each room. Also, the first floor dining area could be used for performances and large gatherings, if they took place after mealtimes.

The physical therapy pool could be located with the physical therapy rooms on the third or fourth floor of building 1A by using an "above-floor" pool, set on the floor, if the floor is strong enough to support its weight. If not, there would still be room on the first floor of Bldg 1A for the pool to be installed on-grade there. A below-grade, concrete surfaced pool is not recommended, unless potential pool bed cracking and pipe breaks can somehow be avoided.

4.1.3. Modifications Needed - Option 1

Although Buildings 1A and 1B are very suitable for the desired center, some modifications would still be needed.

The biggest cost item would be the addition of an elevator to serve both the 6-story apartment and 4-story building. An elevator is needed because many handicapped children can't negotiate the stairs. The elevator would probably be located on the northern exterior of Bldg 1B's stairwell, and be connected to Building 1A on the first four floors by a sloping ramp to the exterior of Building 1A's stairwell. The elevator might not be needed if children unable to negotiate stairs were housed on the apartments' second or third story where they could more easily be carried up and down. Also school students unable to negotiate stairs would similarly need to be carried to school facilities on the upper floors of the school building.

Another significant modification would be the expansion of the plumbing fixtures and system in both buildings, especially for the larger bathrooms needed in the Building 1B apartments.

Other modifications needed would include removing and adding some walls, primarily in Building 1A, expanding the electrical system, and installing the physical therapy pool.

4.1.4. Cost and Availability – Option 1

Based on discussions with the building contractors, Buildings 1A and 1B are for sale for an estimated \$US 412.2 k, and \$US 259.3 k respectively. The cost of modifications is estimated to be \$US 212.5 k, bringing the total cost (not including furniture and appliances) to \$US 883.9 k. This works out to a purchase and renovation unit cost of \$391/square meter, which equals \$36.41/ square feet. The details of these estimates can be found in the Cost Estimate Appendix.

Both buildings 1A and 1B are currently under construction, and should be completed by August 2000. It is estimated that the required renovations could be completed within two months. Both money and time could be saved if the buildings are purchased before initial construction is

complete, because some of the wall renovations would not be needed if the walls were placed where they need to be for the center in the first place.

4.2. Option 2 - Building 2b

4.2.1. Building Description – Option 2

Option 2 consists of the eastern most portion of building 2, known as Building 2B, as can be seen on the Site Map appendix. The setback is protected from the street by a 2-meter tall block wall encircling the site.

Building 2B is a six-story building with about 2,856 square meters of available space, 475 square meters on each of the six floors. The floor-to-floor heights are a tight 2.0 meters on every floor. The building looks as if it was designed to be an apartment building, with very small apartments of 3-meter by 3-meter rooms. There are two stairways on either end of the building, servicing all six floors.

Building 2B was NOT constructed with load-bearing concrete frames. Instead it was constructed with load-bearing walls, where the internal walls bear the load of the walls above. This makes it very difficult, if not impossible, to remove the walls without destroying the entire building.

4.2.2. Program Suitability – Option 2

Building 2B is NOT at all suitable for the components of the agency's new center, even with the same modifications as mentioned for Option 1. This is primarily because the walls of Building 2B are all load-bearing, and consequently, not removable. Also, the rooms as they are, are not well suited for the agency's goals. Building 2B was designed to be a very compact residential building, and does not lend itself to the institutional uses that the agency needs, nor does it have adequate lighting and ventilation for an institutional residence.

The building theoretically has more than enough space for the program of the new center (2,856 square meters available for the 2220 square meters required), but in reality, it is the wrong kind of space, and in rooms too small for most of the center's needs. No attempt was made to even divide the program components into the building because of this unsuitability.

4.2.3. Modifications Needed - Option 2

All of the modifications mentioned for Option 2 would be needed for Building 2B as well, including the elevator. The only option not needed would be the wall modifications, which would not be possible. The modifications that are possible would not make the building any more suitable for the agency's needs.

4.2.4. Cost and Availability – Option 2

Based on discussions with the building contractors, Buildings 2B is for sale for an estimated \$US 681.7 k. The cost of modifications is estimated to be \$US 175.0 k, bringing the total cost (not including furniture and appliances) to \$US 856.7 k. The details of these estimates can be found in the Cost Estimate Appendix.

Building 2B is also currently under construction, and should be completed by August 2000. It is estimated that the required renovations could be completed within two months.

4.3. Site Evaluation Matrix

The following table summarizes the important aspects of each option:

	Option 1 – Bldg 1A & 1B	Option 2 – Bldg 2
Cost Estimate - Total *	<u>\$ 883.9 k *</u>	<u>\$ 856.7 k *</u>
Purchase Price Estimate	\$ 671.4 k	\$ 681.7 k
Modification Estimate	\$ 212.5 k	\$ 175.0 k
Program Suitability (after modifications)	Excellent	Very Poor
Indoor Area – Total	2256 sq m	2850 sq m
Outdoor Area	415 sq mtrs	790 sq mtrs
Major Modifications Needed	Wall modifications Add elevator More bath fixtures More electricity Physical Therapy Pool	Add elevator More bath fixtures More electricity Physical Therapy Pool
When Available		
Before Modifications	End of August ?	End of August ?
After Modifications	October?	October ?
Distance from Office	20 minutes	20 minutes

* - cost estimate does not include furniture or appliances

4.4. Building Evaluation Conclusion

EMI firmly recommends that Option 1 be pursued for the new center over Option 2. Both Option 1 and Option 2 cost about the same amount of money and would be available at about the same time. However the buildings of Option 1 are much more suitable for a handicapped children's center than the Option 2 building. If another option presents itself, it can be evaluated on how adequately it would fit the Program Space Requirements of Appendix 1.

5.0 Summary

EMI has considered it privilege to serve the agency as they care for the handicapped children. If the agency requires assistance in fully designing the renovation of a building into their new center once it is acquired, EMI would be glad to help as we are available.

6.0 Appendices

- APPENDIX 1 - Program Space Requirements
- APPENDIX 2 - Cost Estimates
- APPENDIX 3 - Site Map of Potential Buildings
- APPENDIX 4 – Ground Floor Existing Layout – Building 1A and Building 1B
- APPENDIX 5 – Upper Floors Existing Layout – Building 1A and Building 1B