



EMERGENCY ASSESSMENT YUSHU EARTHQUAKE

TOWNSHIP CLINIC SITE ASSESSMENTS

GENERAL In may and June of 2010 we were asked to travel to several townships in the Yushu prefecture to assess the existing health bureau clinic sites their redevelopment potential. This assessment was performed generally from a physical standpoint, looking at site area, orientation and apparent capacity as well as the advisability of capturing varying levels of rural health care services with respect to their locations relative to other township resources. We also considered both the relative isolation and accessible populations served in forming our preliminary recommendations.



We visited a total of seven sites in five days in the following order:

- Anchong
- Haxiu
- Longboa
- Shanglixu
- Zhongda
- Xiewu
- Surmang

We understand from our meetings that the Longboa site will be redeveloped by the central government and is not addressed in this report. Similarly, it appears as though the Surmang Foundations site will likely take over the township clinic functions in conjunction with the Health Bureau. We have subsequently left out any evaluation of the existing Surmang Township site.

Satellite view of the region with township locations indicated.

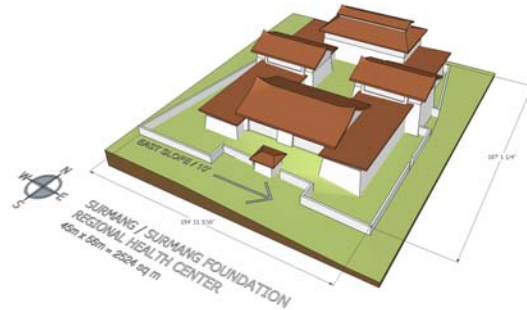
The sites were assessed for their physical attributes and embracing the assumption that all of the buildings that were currently still standing would be completely demolished to make way for replacement facilities. No effort was made to assess the condition of the existing clinic buildings. Further programmatic capacity as referenced in our recommendations for each site are made in the context of derived areas based on the design of the new regional medical center planned for the Surmang Foundations campus.



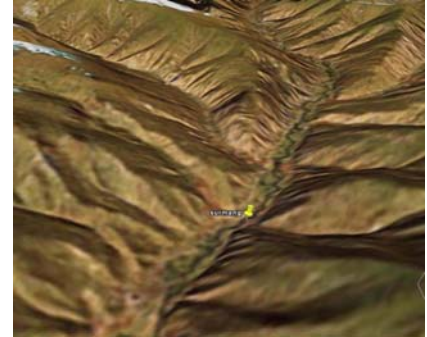
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SURMANG CAMPUS



Surmang Site diagram showing new regional medical center



Site location

SITE CHARACTERISTICS The Surmang site is approximately 2520 sm, south orientation along the long axis and an east slope of approximately 10 feet. The site is located in the valley floor at approximately 12,500 feet above sea level and is the location of the Surmang Foundations clinic for the past 17 years. The site is approximately a 6 hour drive from Yushu.

The site is well suited to both Solar and micro-hydro potential and both power sources are under consideration. There is a relatively new solar photo-voltaic farm just down the valley by a few hundred yards, that is currently serving part of the existing clinic's load.

The Plan for the new regional medical center calls for a complete rebuilding of the site, and will offer outpatient treatment, Observation beds, a Treatment / procedure room and office, educational and physician residence facilities. The new facility will provide a compelling location for continuing and expanding operations including community health education, distance medicine, and enhanced capabilities for patient care on site.

RECOMMENDATION We believe that the long term success of the clinic to date, combined with the validation that it has received through recent assessment efforts from Beijing, position this facility to serve the area in general. The Surmang Township clinic, which exists approximately 1.5 hours up the road back to Yushu could reasonably be accommodated in this new facility.



Campus view from the east slope



Campus view from the road approach



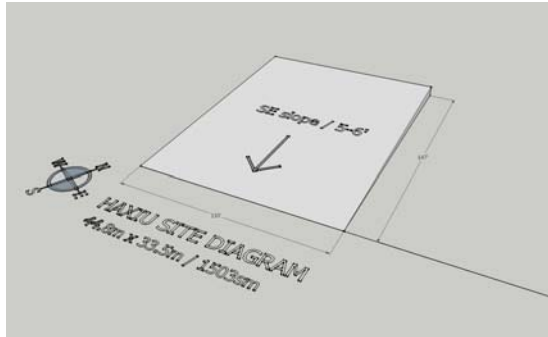
View of the current site entry



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HAXIU



Haxiu site diagram showing size, orientation and slope



Site location

SITE CHARACTERISTICS The Haxiu site is located on the main prefecture road that connects Anchong, Longboa and Shanglixu (indirectly). The site is visible from some distance and the township along with the monastery further up the valley, have a commanding view of its valley. The site is 1485 square meters, is oriented to the SE and has a gentle slope of approximately 6 feet along the long SE axis.

There is good solar potential, and with the large river further down slope, the possibility for micro-hydro power as well.

RECOMMENDATION We believe that the location of the site argues for a medical center similar to that planned for Surmang. Its size however, suggests a slightly smaller facility. Depending on the central government's plan for Longbao, we might lean more toward outpatient treatment and community health education at Haxiu over more intensive treatment regimens that may require 24 hour observation which could be allocated to a Longbao facility or of course in Yushu.



Haxiu from across the river



View of entry to clinic site



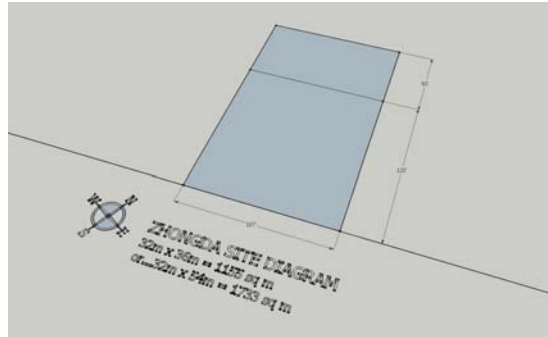
Hosts of our site visit



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ZHONGDA



Zhongda Site Diagram showing size and orientation



Site location

SITE CHARACTERISTICS The road to Zhongda is arduous and slow as it is beautiful. Even though substantial improvements are under way, they appear primarily focused on maintaining the existing roadway, and not necessarily improving travel times. The point is that the Zhongda site is remote, and as such, an important location for a localized facility.

The site is potentially 1728 sm if the approximately 573+- sm area to the NW of the main site is available as was stated to us during our visit there. The site has a SE orientation and is essentially flat. Without the additional area, this is the smallest site that we looked at.

We saw evidence of solar power distribution around the township. We understood that there is a dam further up the river that provides hydro electric power as well.

RECOMMENDATION The current site could accommodate an outpatient focused facility with some community education space. Should the evaluation prove positive regarding the expanded site, more intensive trauma capabilities could be anticipated. We believe that given the remote location of the township, not dissimilar to Surmang that the expanded site and program is well worth considering.



On the road to Zhongda



View of the Zhongda site



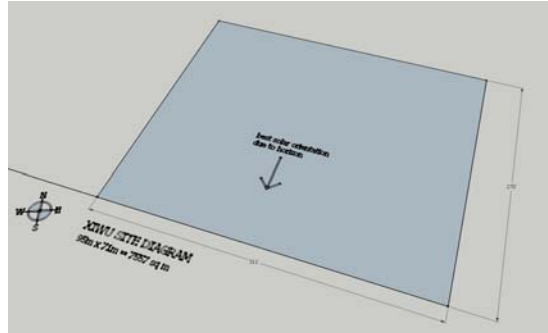
View from road: possible site extension to the right



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XIEWU



Xiewu Site Diagram showing size, orientation



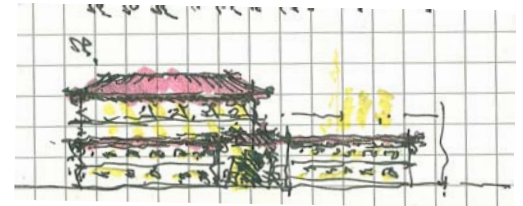
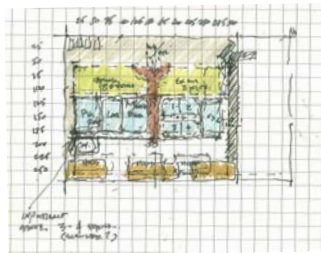
Site location

SITE CHARACTERISTICS

The Xiewu site is strategically located on the main roads to Yushu, Xining and Nanjing. It is the largest site that we looked at, consisting of 3320 sm, almost twice the size of Surmang. It is essentially a flat site, with a SW orientation. There is already a large bank of solar collectors at the North corner of the site and there appears to be abundant power. There appears to a significant amount of construction that is either under way, and / or will have to be replaced due to the earthquake.

RECOMMENDATION

Given the important strategic location of the site, its size and current staffing levels, we believe that a larger regional facility would be valid to consider here. We did a very preliminary diagram of the site, and believe that with tight planning, that a full service hospital including 3-4 surgeries, a large outpatient / clinic capacity and approximately 40 inpatient beds could be accommodated here.



View from site looking toward entry along the west side



View to the north



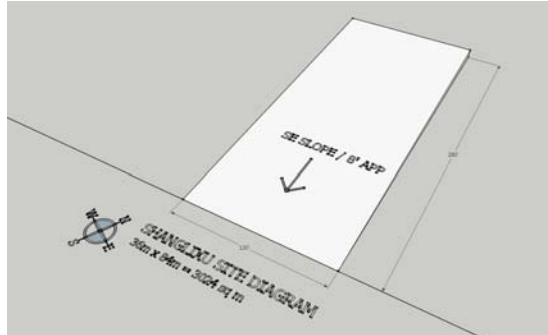
View of recent building that will have to be rebuilt



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SHANGLAXIU



Shanglaxiu site diagram showing size, orientation and slope



Site location

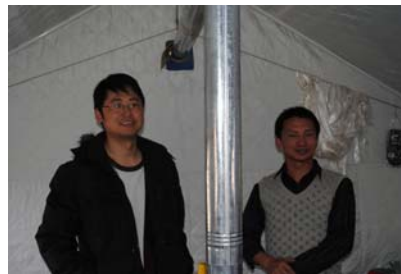
SITE CHARACTERISTICS The Shanglaxiu site is approximately 80 KM from Yushu on a generally good road, and we understand that Longbo is accessible by another road approximately 40 KM away. It is a large site, at 1488 sm with a SE orientation toward a very expansive valley exposure. The site slopes approximately 10' along the long axis running toward the SE.

The two young public health physicians posted at the site were very gracious and informative, and in their several weeks there had not seen any quantity of patients to mention.

RECOMMENDATION While this is a larger site, its relative accessibility to other major centers suggests to us that its re-development is best limited to outpatient treatment. Other functions such as community health education and trauma treatment could be handled either by traveling CHW's or travelling to one of the other regional centers.



View of Shanglaxiu site from entrance



Public health doctors on assignment in Shanglaxiu



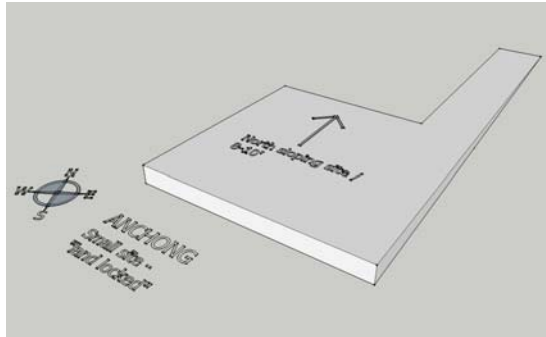
View of the site toward the entrance



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TOWNSHIP CLINIC SITE ASSESSMENTS

ANCHONG



Anchong Site diagram showing size, orientation and slope



Site location

SITE CHARACTERISTICS The Anchong site is a 130 KM drive from Yushu and passes through Longbao and Haxiu on the way. There appear to be several monasteries along the way. The township itself is tightly fit into the confluence between two rivers and the associated steeply sloping mountains that surround it. The clinic site is similarly tightly crowded in upon with little opportunity to increase the clinics physical size.

The site is oriented to the NE, and slopes down in this direction approximately 8-10' across its longest dimension. The site is also L shaped, with the handle being defined by a major solar powered cell tower installation to the N.

RECOMMENDATION Given its relative distance from Yushu, and the fact that there are more accommodating sites along the way, our view of the Anchong site was to redevelop it with only outpatient services with Health education and Trauma care reserved for either travelling CHW's or accessing on of the regional centers at either Haxiu or Longbao.

Should this site appear viable for development of a larger center, there is land across the river that appears to be both accessible and generous in its dimension and solar orientation. We are unsure as to the ownership of this land, but this is the only opportunity we saw in Anchong for development of a more substantial facility.



View of the Anchong clinic site



Township approach road showing bridge over river



Possible alternate site across the river



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TOWNSHIP CLINIC SITE ASSESSMENTS

SUMMARY SITE DATA This chart illustrates site data for location, elevation, size and connectivity within townships. These are based on odometer readings during our travels predominantly and locational readings taken at the individual sites.

| YUSHU EMERGENCY SERVICES PLANNING CLINIC SITE ASSESSMENT DATA | | | | | Connectivity <i>NOT</i> going back through Yushu | | | | | | | |
|--|---------------------------|----|-------|---|--|-------------|-------|---------|---------|------------------------|-------------------|---------|
| | | | | | Yushu | Xiewu | Haxiu | Zhongda | Anchong | Longbao | Shanglixu | Surmang |
| Site area in Square meters | | | | | na | 6,745 | 1,485 | 1,728 | 1,296 | na | 3,024 | 2,520 |
| | | | | | | | | | Approx | | | |
| Yushu | | | | | | | | | | | | |
| lat | 33 | 00 | 05.28 | N | | | | | | | | |
| long | 97 | 00 | 35.39 | E | | | | | | | | |
| elev | 12,097 ft above sea level | | | | | | | | | | | |
| Declination | 0 deg 37' w | | | | | | | | | | | |
| Xiewu | | | | | | | | | | | | |
| | | | | | 52km | | | 61km | | | | |
| lat | 33 | 07 | 54.07 | N | wide / m 71 | | | | | | | |
| long | 97 | 19 | 45.99 | E | Long / m 95 | | | | | | | |
| elev | 12,630 ft above sea level | | | | Orientation South West | | | | | | | |
| Declination | 0 deg 41' w | | | | Slope Flat | | | | | | | |
| Haxiu | | | | | | | | | | | | |
| | | | | | 91km | | | | 42km | 14km | 54km | |
| lat | 33 | 22 | 23 | | | wide / m 45 | | | | | Thru Longbao | |
| long | 96 | 24 | 16 | | | Long / m 33 | | | | | | |
| elev | similar to Zhongda | | | | Orientation South East | | | | | | | |
| Declination | | | | | Slope SE - 8' | | | | | | | |
| Zhongdha | | | | | | | | | | | | |
| | | | | | 71km | 61km | | | | | | |
| lat | 33 | 14 | 53.41 | N | | wide / m 32 | | | | | | |
| long | 97 | 00 | 30.96 | E | | Long / m 54 | | | | | | |
| elev | 11,956 ft above sea level | | | | Orientation South East | | | | | | | |
| Declination | 0 deg 37' w | | | | Slope Flat | | | | | | | |
| Anchong | | | | | | | | | | | | |
| | | | | | 133km | | 42km | | x | 56km | 96km | |
| lat | 32 | 27 | 11 | N | | wide / m 36 | | | | | Thru Longbao | |
| long | 96 | 38 | 11.60 | E | | Long / m 36 | | | | | | |
| elev | 12,557 ft above sea level | | | | Orientation North East | | | | | | | |
| Declination | 0 deg 33' w | | | | Slope NE slope - 8-10' | | | | | | | |
| Longbao | | | | | | | | | | | | |
| | | | | | 77km | | 14km | | 56km | x | 40km | |
| lat | 33 | 16 | 20 | N | | thru Yushu | | | | | | |
| long | 96 | 25 | 33 | E | | | | | | | | |
| elev | 13,773 ft above sea level | | | | | | | | | | | |
| Declination | 0 deg 31' w | | | | | | | | | | | |
| ShangLaxiu | | | | | | | | | | | | |
| | | | | | 80km | | 54km | | 42km | 40km | x | |
| lat | 32 | 51 | 13 | N | | | | | | wide / m 36 | | |
| long | 96 | 35 | 04 | E | | | | | | Long / m 84 | | |
| elev | 13,578 ft above sea level | | | | | | | | | Orientation South East | | |
| Declination | 0 deg 4' w | | | | | | | | | Slope SE - 8' | | |
| Surmang | | | | | | | | | | | | |
| | | | | | | | | | | | wide / m 45 | |
| lat | 32 | 11 | 30.34 | N | | | | | | | Long / m 56 | |
| long | 97 | 15 | 27 | E | | | | | | | Orientation South | |
| elev | 13,161 ft above sea level | | | | | | | | | | Slope East - 10' | |
| Declination | 0 deg 41' w | | | | | | | | | | | |



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TOWNSHIP CLINIC SITE ASSESSMENTS

PROGRAM DERIVATIONS This chart indicates the relative capacity of the individual sites to accommodate a range of programmatic elements. The derivative formulas are predicated on the final plan for the Surmang Campus regional medical center. This derivative information is provided more as a general indicator of relative site capacity, which will vary upon further detailed analysis and functional site planning.

**EMERGENCY ASSESSMENT
YUSHU EARTHQUAKE
MULTI-SITE ASSESSMENT**

| PROGRAM DERIVATIONS | | Building footprint | | | | | | | | |
|---------------------|---------------|--------------------|----------------|------------------|--------|------------------|-----------|---------------------|----------------|------|
| Site area | | Main floor | entry / triage | outpatient areas | office | observation beds | education | kft/ community room | Treatment area | |
| | | | | | | | | | | % |
| Surmang | 2,520 sm | 49% | 14% | 16% | 18% | 16% | 6% | 19% | 9% | |
| | | 1,240 sm | 175 | 200 | 229 | 200 | 79 | 240 | 115 | |
| | | 13,482 sf | 1,903 | 2,179 | 2,493 | 2,179 | 859 | 2,613 | 1,253 | |
| | | | # of units | 1 | 5 | 4 | 8 | 2 | 1 | 1 |
| Haxiu | 1,485 sm | 731 sm | 14% | 16% | 18% | 16% | 6% | 19% | 9% | |
| | | 7,945 sf | 103 | 118 | 135 | 118 | 47 | 142 | 68 | |
| | | | 1,121 | 1,284 | 1,469 | 1,284 | 506 | 1,540 | 738 | |
| | | | # of units | 0.59 | 2.95 | 2.36 | 4.71 | 1.18 | 0.59 | 0.59 |
| Zhongda | 1,728 sm | 851 sm | 14% | 16% | 18% | 16% | 6% | 19% | 9% | |
| | expanded site | 9,245 sf | 120 | 137 | 157 | 137 | 54 | 165 | 79 | |
| | | | 1,305 | 1,494 | 1,709 | 1,494 | 589 | 1,792 | 859 | |
| | | | # of units | 0.69 | 3.43 | 2.74 | 5.49 | 1.37 | 0.69 | 0.69 |
| | 1,155 sm | 568 sm | 14% | 16% | 18% | 16% | 6% | 19% | 9% | |
| | current site | 6,179 sf | 80 | 92 | 105 | 92 | 36 | 110 | 53 | |
| | | | 872 | 999 | 1,143 | 999 | 394 | 1,198 | 574 | |
| | | | # of units | 0.46 | 2.29 | 1.83 | 3.67 | 0.92 | 0.46 | 0.46 |
| Shanglixu | 3,024 sm | 1,488 sm | 14% | 16% | 18% | 16% | 6% | 19% | 9% | |
| | | 16,178 sf | 210 | 241 | 275 | 241 | 95 | 288 | 138 | |
| | | | 2,284 | 2,615 | 2,992 | 2,615 | 1,031 | 3,136 | 1,504 | |
| | | | # of units | 1.20 | 6.00 | 4.80 | 9.60 | 2.40 | 1.20 | 1.20 |
| Xiewu | 6,745 sm | 3,320 sm | 14% | 16% | 18% | 16% | 6% | 19% | 9% | |
| | | 36,086 sf | 469 | 537 | 614 | 537 | 212 | 643 | 309 | |
| | | | 5,094 | 5,832 | 6,673 | 5,832 | 2,299 | 6,994 | 3,354 | |
| | | | # of units | 2.68 | 13.38 | 10.71 | 21.41 | 5.35 | 2.68 | 2.68 |
| Anchong | 1,296 sm | 638 sm | 14% | 16% | 18% | 16% | 6% | 19% | 9% | |
| | | 6,934 sf | 90 | 103 | 118 | 103 | 41 | 124 | 59 | |
| | | | 979 | 1,121 | 1,282 | 1,121 | 442 | 1,344 | 644 | |
| | | | # of units | 0.51 | 2.57 | 2.06 | 4.11 | 1.03 | 0.51 | 0.51 |

End of report