Introduction

Newtok has the option to obtain used barracks from JBER for use as community housing in Mertarvik. The barracks are 10 years old and have been well maintained. The barracks will require renovation to meet building code. They have minimally acceptable insulation, and are comparable to traditional Housing and Urban Development (HUD) type housing from 10-15 years ago.

The purpose of this summary is to report on costs to renovate and relocate 26 modules (equivalent of 13 each, 4-bedroom dwellings) to Mertarvik in a single shipment. The 4-bedroom unit was chosen as the preferred dwelling in an effort to maximize efficiencies using standardization of components to develop the lowest cost possible. (See Figure A.) Each barrack consists of 4 modules, the smallest shipping unit, at 14’ x 68’ in size.

Code and Condition Survey: A code and conditions survey was completed for the barracks in June 2107. The code and conditions survey determined that the units are in very good condition, well maintained, and suitable for use as residential housing, with modifications for current building codes. At minimum, the modules will need the following work:

1. Replace bedroom windows with egress compliant type.
2. Replace stairs for egress compliance.
3. Install underfloor soffit in lieu of insulated crawlspace skirting.
4. Remove and replace gas fired heating system and water heaters with diesel based systems.
5. Removal of sprinkler, fire alarm and emergency lighting systems (required for dorms, not residential houses).
6. Removal or modification of plumbing systems and installation of appropriate system for the new village.
7. Convert electrical systems from 3-phase to 1-phase power to suit the proposed community electrical system.

Concept Design and Cost Estimate: A concept design and cost estimate (report) was completed for the barracks in August 2017. The report investigated separating the barracks into individual units and then renovating the units into two (2) or four (4)-bedroom dwelling units based upon community input. The community selected the 4-bedroom unit as the preferred to best address the housing shortage. The report also identified a need for arctic entries for the houses; thermal envelope upgrades that should be made to meet minimum energy efficiency; recommended mechanical and electrical systems; and module transport logistics.

The report recommends removing the existing roofs to facilitate transport from Anchorage to Mertarvik on rail and barge; and then shipping the modules with new roof packages (truss, plywood, and metal). This would provide a least cost option by maximizing barging efficiency and a better final product. This option would require much of the renovation of the modules at JBER, in Anchorage, with final renovation, installation of new roofs and arctic entries being completed in Mertarvik.

The renovation tasks recommended in the report would create high quality permanent housing stock for the residents in Mertarvik for the next 30 – 40 years. The renovations would represent the same quality of new housing that might be obtained by other means, assuming a thermal upgrade is incorporated into the project.
Mertarvik – Barracks Relocation
Executive Summary

Renovation & Relocation Cost Estimate

Assumptions:

1. 26 modules will be renovated to make 13 each, 1,790 square foot 4-bedroom dwellings.
2. Base cost is for the project to be competitively bid using Davis/Bacon (residential) wages. Funding from the Denali Commission does not trigger a requirement for Davis/Bacon wages.
3. A complete barge load of modules would be made in one shipment. Barge can hold 26 modules, which is equivalent of 13 dwelling units, plus crane and 8 other flats for roofing trusses, metal roofing, arctic entry material, fuel tanks and other bulk material.
4. Thermal upgrades to exterior walls are not included in the base cost. Base cost does include thermal upgrades to windows and doors, roof insulation, and underfloor insulation.
5. No cost allocated for connecting units to electrical grid or expansion of the grid from prime power source.
6. Pad and foundation cost in the estimate is for direct labor only; cost of equipment and fuel, gravel, etc. is absorbed by NVC as a contribution.
7. Driveway costs are not identified at this time.
8. A General Contractor will be involved to oversee JBER work by others or Mertarvik work by others.
9. Road construction will be funded under current BIA contracts.
10. Community water supply and wastewater disposal are not included in this summary. It is assumed housing units will have small water storage tank and honey bucket system for wastes.

Cost Analysis:

A cost analysis to renovate and relocate the barracks to Mertarvik based upon the assumptions:

<table>
<thead>
<tr>
<th></th>
<th>$/SF</th>
<th>$/Unit</th>
<th># Units</th>
<th>Total $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base cost</td>
<td>$188</td>
<td>$337,410</td>
<td>13</td>
<td>$4,386,330</td>
</tr>
<tr>
<td>Exterior Wall Thermal Upgrade</td>
<td>$19</td>
<td>$34,600</td>
<td>13</td>
<td>$449,800</td>
</tr>
<tr>
<td>Recommended Base Cost</td>
<td>$208</td>
<td>$372,010</td>
<td>13</td>
<td>$4,836,130</td>
</tr>
</tbody>
</table>

Recommended Base Cost $372,010

13 $4,836,130

Deduct for using National Guard labor on JBER (1) ($34,880)

13 ($453,440)

Deduct for using Tribe labor in Mertarvik at lower burden rate, $41/hour.

($22,550)

13 ($293,150)

Potential Cost w/ Reductions $176

$314,580

13 $4,089,540

(1) Work includes separating modules, interior demolition per final plans, removal of roofs, renovation to windows and thermal envelope, new walls, new electrical & heating, preparation for shipment.
Mertarvik – Barracks Relocation
Executive Summary

The cost of a 4 bedroom, 1,790 SF, house in Mertarvik using the Barracks with exterior thermal upgrades is $372,010. Total project cost for 13 units, with thermal upgrade, is $4,836,130.

If an IRT project was available for JBER work, and NVC tribal members were used in Mertarvik, then the individual housing cost could be reduced to $314,580. Total project cost for 13 units, with thermal upgrade, is $4,089,540.

Reference of housing costs known in Mertarvik:

<table>
<thead>
<tr>
<th>Agency</th>
<th># of Bedrms</th>
<th>Size</th>
<th>Sq. Ft.</th>
<th>Cost</th>
<th>$/SF</th>
<th>R-value Roof/Wall</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVCP-RHA</td>
<td>3</td>
<td>28’ x 36’</td>
<td>1,008</td>
<td>$343,773</td>
<td>$341</td>
<td>50/37</td>
<td>“all in” price. 5 Star Plus construction.</td>
</tr>
<tr>
<td>AVCP-RHA</td>
<td>4</td>
<td>28’ x 48’</td>
<td>1,344</td>
<td>$454,331</td>
<td>$338</td>
<td>50/37</td>
<td>“all in” price. 5 Star Plus construction.</td>
</tr>
<tr>
<td>CCHRC</td>
<td>3</td>
<td>32’ x 36’</td>
<td>1,152</td>
<td>$363,219</td>
<td>$315</td>
<td>60/40</td>
<td>Foundation is Triodetic foundation w/ skids. Assume $10,000 for gravel pad. 5 Star Plus construction.</td>
</tr>
<tr>
<td>Paug-vik Development Corp.</td>
<td>4</td>
<td>32’ x 42’</td>
<td>1,365</td>
<td>$443,625</td>
<td>$325</td>
<td>38/22</td>
<td>Based upon a 7 unit project. 5 Star Plus construction.</td>
</tr>
<tr>
<td>Barracks (1)</td>
<td>4</td>
<td>28’ x 64’</td>
<td>1,790</td>
<td>$372,010</td>
<td>$208</td>
<td>40+/30</td>
<td>“all in” price; includes thermal upgrade.</td>
</tr>
<tr>
<td>Barracks (2)</td>
<td>4</td>
<td>28’ x 64’</td>
<td>1,790</td>
<td>$314,580</td>
<td>$176</td>
<td>40+/30</td>
<td>Assumes IRT and NVC labor assistance.</td>
</tr>
</tbody>
</table>

“all in” price = materials, labor, shipping, foundation, gravel pads.

Funding:

The total funding that is currently available for housing is ~$1,800,000 ($300,000 in BIA HIP funds, and $1.5 million in Denali Commission Funding).

Logistics

Barging:

Barracks will be disassembled into modules on JBER. The modules would be moved to Seward for shipping. An entire barge would be rented for shipment of modules, crane, and limited deck space for miscellaneous materials. NVC will have to provide cargo insurance. Crane will have to remain in Mertarvik to offload modules and to place onto foundations; then shipped out at end of season.

Roads:

Approximately 4100 LF of roads should be built in 2018 to support a housing program. (See Figure B.) Funding for roads is provided under a NVC – BIA contract. Figure B identifies the proposed roads and lots for housing in Mertarvik. The road design will have to accommodate...
both the use of a crane and module sizes. Roads and pads need to be complete before units arrive in Mertarvik.

Pads:
Assume same design used for 2017 houses is appropriate for barracks. It takes about 2 days to build a house pad. 13 pads are needed for the dwellings, therefore the schedule reflects a one month duration for pads.

**Schedule**

The schedule proposes the initial renovation work to start at JBER and the construction of roads and lots for the houses in Mertarvik to occur in 2018. The modules will be moved to Mertarvik and final construction of the houses to occur in 2019. (See Figure C.)

**Contacts**

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Newtok-Mertarvik Village Relocation: Barracks Relocation Schedule

<table>
<thead>
<tr>
<th>ID</th>
<th>Task Name</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mertarvik -- Barracks Relocation</td>
<td>522 days</td>
</tr>
<tr>
<td>2</td>
<td>Agree to Plan</td>
<td>43 days</td>
</tr>
<tr>
<td>3</td>
<td>Secure Funding</td>
<td>64 days</td>
</tr>
<tr>
<td>4</td>
<td>Hire General Contractor</td>
<td>43 days</td>
</tr>
<tr>
<td>5</td>
<td>Purchase Materials</td>
<td>44 days</td>
</tr>
<tr>
<td>6</td>
<td>Roads</td>
<td>43 days</td>
</tr>
<tr>
<td>7</td>
<td>Gravel Pads</td>
<td>23 days</td>
</tr>
<tr>
<td>8</td>
<td>JBER Work</td>
<td>65 days</td>
</tr>
<tr>
<td>9</td>
<td>Ship Modules to Mertarvik</td>
<td>45 days</td>
</tr>
<tr>
<td>10</td>
<td>Place &amp; Construct in Mertarvik</td>
<td>109 days</td>
</tr>
<tr>
<td>11</td>
<td>Connect Prime Power</td>
<td>22 days</td>
</tr>
<tr>
<td>12</td>
<td>Move In</td>
<td>44 days</td>
</tr>
</tbody>
</table>