PHASE 2: VILLAGE HOUSING ASSESSMENT FOR THE VILLAGE OF MERTARVIK

FOR DOWL ENGINEERS AND NEWTOK VILLAGE

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BETTISWORTH NORTH

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EXECUTIVE SUMMARY

Bettisworth North and our consultants have completed our Phase 2 Report of the housing module reconfiguration located on JBER, for the Denali Commission, DOWL Engineers, and the Newtok Village. The Phase 2 report is a follow on to our Phase 1 feasibly report, executing the recommendations for reuse of the JBER Barracks.

Our work in this phase included developing renovation plans to convert the units to 2 and 4 bedroom dwellings from 3 bedroom troop dormitories, and developing a cost estimate that encompasses the reconfiguration work, logistics in moving the units to Mertarvik, and follow on work required at the new site to provide finished dwelling units.

The renovations followed our Phase 2 recommendations, and incorporated input from the Newtok Village Council on the local needs and desires of the future owner residents. We feel we have vetted the input and incorporated their ideas as well as we could, while meeting applicable code and operational requirements.

The 2 bedroom and 4 bedroom dwelling quantities followed the housing study findings previously developed by CCHRC, and resulted in 96 total new dwellings with 40 being 2 bedroom units in a duplex arrangement, and 56 new 4 bedroom dwellings. The mix of types was strongly supported by the Village Council based on their various sizes of family units.

Moving the modules to Mertarvik will be done by rail to Seward, Alaska, and then by charter barge to Mertarvik. Modification to the module height is required to allow the use of standard moving equipment, while maintaining a maximum 15'-6" road height to avoid costly transport issues. IE low overpasses and electrical power lines. Having some work done on site will allow use of local labor, as a benefit to the community of Newtok.

Our projected cost of the 2 bedroom duplex buildings is $360,000, or $180,000 for each 2 bedroom dwelling. Our projected cost of the 4 bedroom building is $333,000. The cost of moving the existing renovated laundries for use as unheated storage buildings is $20,000 each. The total cost of the housing modules is then approximately $26M. The total cost of the storage buildings is $380,000. The costs represented do not include the cost of the foundations or the cost of the building pads and access roads.

A project work schedule would start with the first phase work at JBER during the winter 2017 with roughly 86 mods being delivered to Mertarvik during the summer 2018. This would equate to approximately 30-40 dwellings. The phase 2 work would include the remaining 66 mods being renovated and stored on site at JBER, then delivered to Mertarvik the summer of 2019.

The reconfiguration tasks recommended in this report would create high quality permanent housing stock for the residents of the new village for the next 30-40 years. The upgrades and refresh would represent the same quality of new housing that might be obtained by other means.

ARCHITECTURAL

General

This report encompasses our Phase 2 work for the feasibility study on the JBER Barracks reconfiguration project to be used as housing for the new community of Mertarvik, Alaska. The phase 2 deliverables include: the rehabilitation plans (demolition and renovation drawings) by BNAP, BBFM Structural Engineers, HZA Engineering (mech) and HZA (electrical), and this narrative of our assumptions. We have hired Paug-Vik Development to develop probable construction cost estimates for the work, including demolition and renovation work done at JBER, dismantling and moving the modules to a barge location, barging to Mertarvik, off-loading on the established barge landing, and transport and setting at the new housing pad locations.

This report is a continuation to our Phase 1 report, with further refinement and input by the Village Council of Newtok, Randy Romenesko of DOWL Engineers, and Don Antrobus of the Denali Commission.

The goals established in our Phase 1 report, were aimed at improving the long term livability of the previous dorm units, correcting code deficiencies, and reconfiguring the units with individual heat and limited plumbing equipment to conform to location specific utilities. Generally the tasks are listed below:

+ Reconfigure 2 bedroom units to prove an adequate kitchen, dining, and living area. The three bedroom would probably become two bedroom units.
+ Add an entry vestibule, with new stairs and entry decks to conform to new height and foundation type.
+ Create an entrance vestibule for unheated storage and to protect the entrance from wind.
+ Improve thermal envelope with new exterior skin of rigid insulation/furring and new siding. Target R-30 minimum walls/floor.
+ Add insulation to the roof with a target of R-40.
+ Build new insulated underfloor soffits to protect underfloor utilities.
+ Replace windows with higher efficiency egress sized windows with new screens.
+ Enlarge attic access hatches for fire access.
+ Replace flooring in 10% of each unit.
+ Replace lighting to LED type fixtures.
+ Convert 3-phase electrical panel equipment to 1-phase electrical.
+ Capping water and waste piping since services are not available.
+ Removing the sprinkler system equipment.

Our reconfiguration designs generally followed this list; however, the methods varied slightly based on additional engineering input and the results of our costing effort.

Methods

We were expected to travel to Newtok to meet with the Village Council, but two trips were cancelled due to weather. Instead, we conducted a teleconference in early August, where we discussed some draft renovation plans created by BNAP. The points made by the Village Council are as follows:

+ Both 2 bedroom and 4 bedroom units are desired, (final quantities following the CCHRC housing needs study conducted previously).
+ Romy sent a few marked up plans with ideas how they might connect the 2 bedroom units together. The design team incorporated elements that they deemed feasible.
+ Room for multiple chest freezers must be included, preferably in a non-heated part of the structure. We targeted an entry vestibule, or “cunnychuk” for this purpose.
+ The Council liked the idea of using the laundry units for storage buildings. We did not detail out how or where these might be located. It is questionable whether they could fit on the same housing pad as the main dwelling due to the size of the pad.

Housing Types

As we started to discuss the 2 and 4 bedroom types, it became critical that we understand the different family needs in the community. To derive this data, we reviewed the housing study conducted by CCHRC in July 2016, titled “Newtok Housing Needs Survey Draft”. The report states the total dwellings needed in Mertarvik currently is 86. It also indicated that 11 more may be needed, due to the incomplete survey scope. It also listed 8 families that might like to move back to Mertarvik if housing existed. So the total housing needs range from 86 to 105 dwellings.

The study also listed the current makeup of house types as (27) 1-2 bedroom, and (58) 3-4 bedroom, and (1) 5 bedroom. With a total of 86.

There are currently 152 housing modules available, which are configured into (152) 3-bedroom dormitory dwelling units. Our current design uses all 152 modules and reconfigures them into (40) 2-bedroom dwellings, and (56) 4-bedroom dwellings, resulting in a total of 96 dwellings. The number of 4 bedroom could be increased with the number of 2 bedroom decreased if that better matches the community desires. However, the overall dwelling count would decrease. Example: (32) 2-bed and (60) 4-bed, (92) total dwellings. I have attached our analysis to this report in the appendix.

Functional Organization

The current organization of the units includes (3) bedrooms, each with a closet, a very small kitchen with two-burner cooktop, microwave oven/fan unit, a single stainless steel sink; and a bathroom with a small vanity, toilet, and shower unit. A closet in the bathroom contains the gas fired water heater. Although the new town-site these would be used as family homes, the existing modules are setup as hotel type occupancies. We have attached the drawings to this report.

Reconfigured Two Bedroom Units: The tasks to reconfigure into 2 bedroom duplexes include: repurposing one bedroom opposite the kitchen to a living room; expanding the kitchen by creating a new location for the refrigerator, creating a space for a new 4 burner electric range, new cabinets with more storage opportunities, replacing the single sink with a double sink to facilitate food and dish washing; altering the bathroom by removing the water heater in the closet, removing the shower which allows the counter to be lengthened to 5 feet, removing the toilet and installing a honey bucket bench with outdoor vent. We also added an unheated entry vestibule capable of storing two chest freezers (L65" X W27" X H34"). New stairs and landing will be required to accommodate the new foundation height. We also added an emergency exit platform to each unit opposite the new Toyostove heater as requested by the Council. This provides each unit two separate ways to exit the building in a fire emergency.

Reconfigured Four Bedroom Units: The tasks to reconfigure two of the 3 bedroom dormitory units into a single 4 bedroom includes: repurposing two adjacent bedrooms into one living room by removing the center joining wall; removing one of the two bathrooms and creating a new expanded kitchen capable of supporting larger family meals; the new kitchen would be fitted with a refrigerator, new 4 burner electric range, new cabinets with more storage opportunities, and replacing the single sink with a double sink to facilitate food and dish washing; altering the remaining bathroom by removing the water heater in the closet, removing the shower which allows the counter to be lengthened to 5 feet, removing the toilet and installing a honey bucket bench with outdoor vent. The remaining existing kitchen would be converted to a storage room where bulk foods, equipment or possibly a chest freezer could be located. We also added an unheated entry vestibule capable of storing two chest freezers (L65" X W27" X H34"). New stairs and landing will be required to accommodate the new foundation height. We also added two emergency exit platforms to this unit opposite the new Toyostove heaters as requested by the Council. This provides each unit two separate ways to exit the building in a fire emergency. In this unit, provisions for two Toyostove heaters are provided for more heat capability.

Interior Finishes

The interior finishes of each unit are in good condition. The walls are finished with vinyl covered gypsum board which has held up very well over time. New interior walls will be wood studs with standard painted gypsum board to save costs. Where walls have been removed, and where currently damaged, the VCT flooring will be patched with like materials. Interior doors will be adjusted as required. New plastic laminate casework will be provided with new plastic laminate counter tops in the bathrooms and kitchens.

Exterior Improvements

The exterior windows will be replaced with new high efficiency vinyl casement units with new screens. The casement windows will meet current code requirements for emergency egress. (Clear opening of 20 inches wide by 24 inches high. (5.0 SF)) We have also considered upgrading the exterior walls with a layer of foam insulation to improve the thermal efficiency and heating costs. The current exterior walls are R-19 (less than Code requires for Anchorage) and the improved walls would be approximately R-30. We have provided a separate cost for this option so it can be evaluated by the Council.

New Roof System

The existing roof is covered with metal roofing at a 2:12 pitch in a gable configuration. Although our observation of the attic showed a dry weather tight condition, there are numerous roof penetrations for attic vents, flues, and plumbing vents, much of which will be removed or capped. The attic is also limited size so adding additional insulation is not feasible. As a result of our study, we have adopted an approach for a new roof assembly for the modules.

This new roof would consist of new trusses with an energy heal providing space for 20” of batt insulation (Aproximately R-60). The trusses would include a new roof overhang of 12” minimum to get rain runoff away from the exterior walls. This would be significant improvement over the existing. New sheathing would be applied to the top of the trusses with underlayment and new through-fastened metal roofing. To install the new roof system, the top of the existing trusses would be removed, leaving in place the bottom chords of the trusses, gypsum board ceilings, and electrical wiring serving the light fixtures. The new trusses would be secured to the top wall plates next to each existing truss location. Attic venting would be accommodated in the new design. The slope of the new roof would be 3:12 to improve snow shedding, and new Code required attic access would be provided. The new roof would remain a cold ventilated attic system.

The process to be followed for this work would be: provide temporary walls to support ceiling system, cut top of trusses off at JBER site, shrink wrap the modules providing temporary weather protection, ship the modules with the new truss package (the reduced shipping height is a significant advantage), set module on new site pads, install the new roof system on the modules.

Mechanical Systems

The existing heating systems, natural gas fired furnaces with ductwork, will be removed in the demolition work. New heating systems will be installed in each unit, consisiting of diesel fired Toyo-stove direct fired units with a small fuel tank located on the exterior. A minimum distance of 3 feet will be maintained between the fuel tank and the exterior wall.

The domestic hot and cold water will be disconnected and capped off for future use. The natural gas direct water heater in the bathrooms will be demolished. Options for fresh water have been discussed, including: a 20-30 gallon water storage tank with a spigot that can be refilled with water jugs, a “PASS” system where a tank and small water pump would feed the two sinks in each unit, or individual 5 gallon water jugs supplied by the residents and located as they need in each unit. The final option will need to be discussed if we proceed forward with the relocation.

Waste water systems will be capped at each fixture and maintained for future reconnection. The toilet will be replaced with a honey bucket enclosure in each bathroom. The enclosure should be vented to the exterior to improve indoor air quality. The shower will be removed and space made available for other uses. IE A usable countertop. The sinks will be fitted with 5 gallon buckets in the sink cabinet and will be emptied by the residents. Resident bathing and clothes washing will be provided in the community use wash/shower facility.

Existing bathroom fans will be retained and could be set up with timers so they run periodically during each day to provide some air change in the dwellings. New operable windows will provide the residents’ means to regulate fresh air as needed.

Module Transport Logistics

The steel I-beams that make up the undercarriage of the building add 12” to the height of the mods. The current modules with the roofs attached are 13’-4” from bottom of beams to ridge. The modules can be stacked on a barge, but supporting the upper tier takes up deck space on the bottom tier, thereby reducing the number of mods that can be transported on one voyage. Of the two barge companies consulted, both think they can move 21 modules at a time using stanchions or shipping containers to support the 2nd tier. The same barge could move 28 or 30 modules if they could stack one on top of another. So we think stacking is the best method.

The height of the existing modules also presents a problem with road transport. Anything above an overall height of 15’-6” high becomes problematic for road travel. At an overall height of 16’-6” the movement requires moving power lines, which is significantly expensive. Carlisle indicates that 4’ is the lowest trailer deck they have to move 64’ units. The units were initially transported on their own axles (3 per unit) which were subsequently removed and are no longer readily available. On their own axles, they were probably just under 15’-6” high. Axles could be found and installed on each mod, perhaps someone could find 4 or 6 sets and re-use them over;

however, this would slow down the process of moving them. This would also involve re-welding all the tongues on as well, and then cutting them off in Mertarvik, and potentially shipping them out. If we removed the existing roof assemblies on the units and shipped them to Mertarvik with new truss packages, it would result in less cost, and a better final product. We have described this process in the above narrative.

Removing existing roof assemblies obviously reduces overall height of units for road transport and barging. Modules could conceivably be stacked on a barge without stanchions. Barging costs could be significantly reduced, by possibly 40%. Modules could be transported to a barge on flat deck trailers given that their height would only be 10'-4" +/- (14'-4" overall with trailer), there would be no need to install axles on every mod for transport from the site. The modules could be shrink wrapped for transport. Demolition of the existing roofing material could be done in Anchorage where disposal is less costly/problematic.

The opposing roof over entrance areas (as required to shed snow) could be framed right into the new roof assembly.

We anticipate the process of moving the modified units would include: trailer transport to the Alaska Railroad in Anchorage, rail travel to Seward, loading onto private barge, and barging to the new community. For private barge services, the community of Seward is a much easier and less costly port to load the modules.

Logistics

A project work schedule would start with the first phase work at JBER during the winter 2017 with roughly 86 mods being delivered to Mertarvik during the summer 2018. This would equate to approximately 30-40 dwellings. The first barge of 2018 would hold 26 mods and the crane, to be followed by a double barge with the remaining 60 mods.

The remaining 66 mods would be renovated and stored on site at JBER, then delivered to Mertarvik the summer of 2019. This would complete the total of 86 dwellings in the fall of 2019.

Cost Considerations

We believe the existing modules can be reconfigured at JBER as described above, with some final work done in Mertarvik to provide 2 and 4 bedrooms dwellings. We have considered the freight efforts and cost of moving the modules and think we have identified the best and least costly alternative. The modifications we have suggested will greatly extend the life and reduce the long term cost of ownership for the residents of Mertarvik.

For the 2 bedroom units we think the cost of renovation and relocation is approximately $180,000 per unit, or $360,000 for a duplex. The 4 bedroom dwellings are approximately $333,000. The cost of relocating the laundries modules is approximately $20,000 per unit. The cost of renovating and moving the 19 laundry units for unheated storage is $20,000 each.

Based on our unit type breakdown, the 2 bedroom dwelling total is $181,821 x 40 EA = $7,224,832, and the total cost of the 4 bedroom units is $333,365 x 56 EA = $18,780,440. The total for both types is approximately $26,053,272 and an average cost of $269,576 per dwelling. This breaks down to an approximate cost of $175/SF.

These costs do not include the cost of the building pads, or the cost of "post and pad" or Triodedic foundation systems. It also assume that electrical power is available at each building site. The cost estimate includes a contingency of 10%.

The projected cost of the building pad obtained from the Denali Commission is approximately $30,000 per building pad. Based on our dwelling type matrix, a total of 76 pads will be needed for the entire project. It is anticipated that 40 pads will be needed the summer of 2018, with the remainder in 2019. This would result in an expenditure of $1.2M in 2018 and $1.08M in 2019.

We will also need post and pad foundations for those 76 buildings, and we estimate these to be approximately $20,000 each. Again, during the first summer, 40 would be required at a cost of $800,000, and 36 required the following summer at a cost of $720,000.

The total cost for all the pads is $2.28M and the cost for the foundations is $1.52M. With these costs added to the construction costs, the total construction cost is approximately $29.8M.

An important note on the costs presented is the economies of scale of this project. There are savings in accomplishing this project as one larger project over a two year period. If only a portion of the modules are renovated, say only half, it is likely the cost per unit could increase 15%-20% because the overhead and management costs are amortized over a smaller number of units.

We have attached an itemized breakdown in the appendix.

Summary and Recommendations

The reconfiguration tasks recommended in this report would create high quality permanent housing stock for the residents of the new village for the next 30-40 years. The upgrades and refresh would represent the same quality of new housing that might be obtained by other means. Even though the modular housing on JBER is now 10 years old, we expect this housing to last another 30-40 years and is a good candidate for renovation and transport to Mertarvik. The modules have been professionally maintained in their present use, adding to the higher quality of the buildings.

With the upgrades outlined in the report, the structures should be very similar in quality to new buildings of similar function; modular or stick construct, or SIP panels. With the reconfigurations of the floor plans, the new units will support the varying family unit sizes adequately, and support the local practices of storing bulk food for long periods, the use of Toyo-stove type heaters, and space for extended family and community gatherings.

If the project can gain funding, based on our finding and analysis, we recommend this renovation work be done and the new housing moved and installed in Mertarvik.

APPENDIX Module Quantity Matrix

Mertarvik Housing Barracks Renovation
Housing Type Analysis
Updated August 23, 2017

Existing Unit Types	Number of buildings	Modules per building	Dwelling units	Bedrms per Dwelling	Qty modules	Module Size
6 bed dorm (2 units of 3)	19	4	76	3	76	27x64
6 bed dorm attached to laundry	19	4	76	3	76	27x64
Housing Sub-Totals (152 total modules)	**38**		**152**	**456 bedrooms**	**152**	
Laundry Unit	19	1			19	27x12
Total Existing Modules (All types)	57				171	

New Unit Types	New detached bldgs	Modules per building	Dwelling Units	Bedroom type	Qty Mods	Qty Dwellings	Type
Convert to 2mod-2 bedrooms	20	2	2	2	40	40	2 bedrooms
Convert to 2 mod-4 bedrooms	56	2	1	4	112	56	4 bedrooms
Housing Sub-Totals	**76**				**152**	**96**	**304 Bedrooms**
Unheated storage units (old laundrys)	19	1			19		
Totals	95						

Cost Matrix

Mertarvik Housing Barrack Renovation
Itemized Construction Cost Breakdown.
Updated 10/3/2017

	Base work	General Conditions	OH &P	Contingency and Bond	Totals/Unit	# units	Total cost
2 Bedroom Dwellings							
2 bdrm work on JBER (labor and material)	$ 62,237	$ 12,379	$ 9,188	$ 9,010	$ 92,814	40	$ 3,712,568
2 bdrm transportation costs	$ 16,700	$ 3,322	$ 2,466	$ 2,418	$ 24,905	40	$ 996,190
2 bdrm work in Mertarvik (labor and material)	$ 42,984	$ 8,550	$ 6,346	$ 6,223	$ 64,102	40	$ 2,564,086
4 Bedroom Dwellings							
4 bdrm work on JBER (labor and material)	$ 108,065	$ 24,274	$ 18,018	$ 17,492	$ 167,849	56	$ 9,399,570
4 bdrm transportation costs	$ 38,900	$ 8,738	$ 6,486	$ 6,297	$ 60,421	56	$ 3,383,550
4 bdrm work in Mertarvik (labor and material)	$ 68,950	$ 15,488	$ 11,496	$ 11,161	$ 107,095	56	$ 5,997,320
Total Construction Cost Subtotal							$ 26,053,284
Site Development for Housing Pads	Estimate based on data from Denali Commission				$ 30,000	76	$ 2,280,000
Foundation for Housing Modules - Post and Pad	Estimate based on previous projects				$ 20,000	76	$ 1,520,000
Total Construction Cost							**$ 29,853,284**
Cost per Dwelling						**96**	**$ 310,972**

Itemized Summary of Costs Above							
Work on JBER (labor and material) - Housing							$ 13,112,138
Work on JBER (labor and material) - Storage							$ 90,739
Transportation Costs - Housing				$ 28,814	per module		$ 4,379,740
Transportation Costs - Storage				$ 11,342	per module		$ 215,506
Work in Mertarvik (labor and material) - Housing							$ 8,561,406
Work in Mertarvik (labor and material) - Storage							$ 68,055
Cost of Housing ext wall thermal upgrades - R19-R30							$ 1,714,000
4 bdrm exterior walls thermal upgrade (labor and material)					$ 22,500	56	$ 1,260,000
2 bdrm exterior wall thermal upgrade (labor and material)					$ 11,350	40	$ 454,000
Additional Elements Not Included Above							
Storage Buildings							
Storage bldg work on JBER (labor and material)	$ 4,000	$ -	$ 485	$ 291	$ 4,776	19	$ 90,739
Storage bldg transportation costs	$ 9,500	$ -	$ 1,152	$ 691	$ 11,342	19	$ 215,506
Storage bldg work in Mertarvik (labor and material)	$ 3,000	$ -	$ 364	$ 218	$ 3,582	19	$ 68,055

Modular Housing
Mertarvik, Alaska
Probable Construction/Relocation Cost of Modules

				# units	Totals
	2 BR unit		**$180,620.80**	40	$7,224,832.00
	4 BR unit		**$333,115.00**	56	$18,654,440.00
	Laundry/Storage mod		**$19,700.00**	19	$374,300.00
					$26,253,572.00

Assumptions

Demo can be completed on units before transport off base
Interior renovations can be completed on base prior to shipment of mods
Rail head is will be available for transload on base
Demoed siding from units can be used to complete siding on laundry mods
No site restoration will be required on base.
No provisions for sitework have been included in this cost estimate
No foundation material or foundation installation have been included in this cost estimate
Barging of foundation material is included
Fondation installation will be completed on a schedule which supports installation of modular units.
All 152 modules plus 19 storage modules, 40 ea 2 bedroom units and 56 ea 4 bedroom units will be solicited under one contract.
Mods would be delivered over 3 voyages (aprox 100 modules in 2017 and the balance in 2019.) Work would start in Mar of 2018 and be completed in Sept of 2019
No provisions for fuel in heating fuel tanks is included in this cost estimate.
Existing flooring will be repaired with similar material where walls are removed and prior damage exists

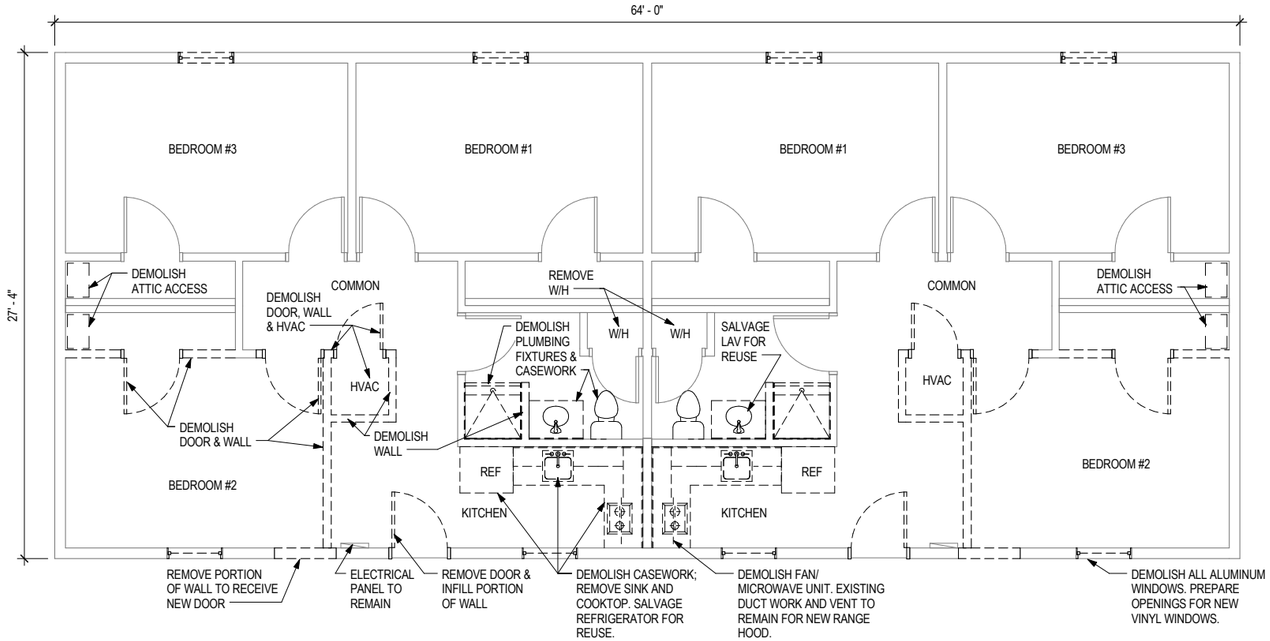
	qty	unit	material description or comments	cost / unit mat/equip	extended mat cost	man hours	labor rate	labor total	total	sub totals
2 BR unit										freight
Demo interior	0	ea		$ -	$ -	20	$75.00	$ 1,500.00	$ 1,500.00	
Demo skirting and siding	0	ea		$ -	$ -	40	$75.00	$ 3,000.00	$ 3,000.00	
Demo windows	0	ea		$ -	$ -	6	$75.00	$ 450.00	$ 450.00	
Roll off	1	ea	40 CY dumpster	$ 1,000.00	$ 1,000.00	0	$75.00	$ -	$ 1,000.00	
Frame new interior walls	1	ea	misc framing	$ 500.00	$ 500.00	25	$75.00	$ 1,875.00	$ 2,375.00	
Electrical	1	ea	Sub estimate	$ 13,500.00	$ 13,500.00	0	$75.00	$ -	$ 13,500.00	
Hang/tape/texture new walls	1	ea		$ 750.00	$ 750.00	40	$75.00	$ 3,000.00	$ 3,750.00	
Patch old flooring after wall demo	1	ea		$ 400.00	$ 400.00	8	$75.00	$ 600.00	$ 1,000.00	
Install new kitchen	1	ea	Rough estimate	$ 1,500.00	$ 1,500.00	12	$75.00	$ 900.00	$ 2,400.00	
Install new interior accessories	1	ea	Rough estimate	$ 500.00	$ 500.00	12	$75.00	$ 900.00	$ 1,400.00	
New windows installed	5	ea		$ 350.00	$ 1,750.00	20	$75.00	$ 1,500.00	$ 3,250.00	
Install new exterior door(s)	2	ea	door & hardware	$ 400.00	$ 800.00	6	$75.00	$ 450.00	$ 1,250.00	
Interior trim windows/doors	1	ea		$ 300.00	$ 300.00	12	$75.00	$ 900.00	$ 1,200.00	
Install new insulation and siding	1104	sf		$ 4.20	$ 4,636.80	100	$75.00	$ 7,500.00	$ 12,136.80	
Install temp walls for shipping	1	lot	re-use wall framing for truss bracing	$ 500.00	$ 500.00	10	$75.00	$ 750.00	$ 1,250.00	
Separate modules by 3'	0	ea		$ -	$ -	25	$75.00	$ 1,875.00	$ 1,875.00	
Remove existing roofing	0	ea		$ -	$ -	20	$75.00	$ 1,500.00	$ 1,500.00	
Remove roof framing	0	ea		$ -	$ -	40	$75.00	$ 3,000.00	$ 3,000.00	
Install temp sheathing	1	ea		$ 500.00	$ 500.00	12	$75.00	$ 900.00	$ 1,400.00	
Shrink wrap module	1	ea		$ 1,750.00	$ 1,750.00	0	$75.00	$ -	$ 1,750.00	
Load module and transport to dock	1	ea		$ 2,500.00	$ 2,500.00	10	$75.00	$ 750.00	$ 3,250.00	
Move mods to Seward via rail	1	ea		$ 2,200.00	$ 2,200.00	0	$75.00	$ -	$ 2,200.00	
Barge modules to Metarvik	1	ea		$ 14,000.00	$ 14,000.00	0	$75.00	$ -	$ 14,000.00	
Install foundations in Metarvik	1	ea	barging only	$ 500.00	$ 500.00	0	$75.00	$ -	$ 500.00	
Set modules on foundations	1	ea		$ 2,500.00	$ 2,500.00	50	$75.00	$ 3,750.00	$ 6,250.00	
Install bearing plates on modules	1	ea		$ 500.00	$ 500.00	30	$75.00	$ 2,250.00	$ 2,750.00	
Install trusses and sheathing	1	lot	mtl	$ 3,200.00	$ 3,200.00	40	$75.00	$ 3,000.00	$ 6,200.00	
Construct vestibules and stairs	1	ea		$ 2,500.00	$ 2,500.00	40	$75.00	$ 3,000.00	$ 5,500.00	
Complete siding	1	ea		$ 500.00	$ 500.00	30	$75.00	$ 2,250.00	$ 2,750.00	
Install metal roofing	1024	sf		$ 3.50	$ 3,584.00	40	$75.00	$ 3,000.00	$ 6,584.00	
Install Toyo stoves	1	ea		$ 1,500.00	$ 1,500.00	6	$75.00	$ 450.00	$ 1,950.00	
Install earth anchors and hdwr	3	ea		$ 200.00	$ 600.00	12	$75.00	$ 900.00	$ 1,500.00	
Install fuel tanks for toyos	1	ea		$ 1,500.00	$ 1,500.00	8	$75.00	$ 600.00	$ 2,100.00	
Install batt insulation	1000	sf		$ 0.80	$ 800.00	12	$75.00	$ 900.00	$ 1,700.00	
Install rigid and OSB under floor	1000	sf		$ 2.25	$ 2,250.00	30	$75.00	$ 2,250.00	$ 4,500.00	
										120720.80
	0	ea		$ -	$ -	0	$75.00	$ -	$ -	
GCs inc flights, housing, equip, etc	1	ea		$ 22,000.00	$ 22,000.00	30	$75.00	$ 2,250.00	$ 24,250.00	
	0	ea		$ -	$ -	0	$75.00	$ -	$ -	
OH	1	ea		$ 9,000.00	$ 9,000.00	0	$75.00	$ -	$ 9,000.00	
	0	ea		$ -	$ -	0	$75.00	$ -	$ -	
P	1	ea		$ 9,000.00	$ 9,000.00	0	$75.00	$ -	$ 9,000.00	
	0	ea		$ -	$ -	0	$75.00	$ -	$ -	
Contingency	1	ea	variation from current assumptions	$ 15,000.00	$ 15,000.00	0	$75.00	$ -	$ 15,000.00	
Bond	1	ea		$ 2,650.00	$ 2,650.00	0	$75.00	$ -	$ 2,650.00	
	0	ea		$ -	$ -	0	$75.00	$ -	$ -	
	0	ea		$ -	$ -	0	$75.00	$ -	$ -	
	0	ea		$ -	$ -	0	$75.00	$ -	$ -	
	0	ea		$ -	$ -	0	$75.00	$ -	$ -	
	0	ea		$ -	$ -	0	$75.00	$ -	$ -	
TOTALS						746			**$180,620.80**	

	qty	unit	material description or comments	cost / unit mat/equip	extended mat cost	man hours	labor rate	labor total	total	sub totals
4 BR unit										
Demo interior	0	ea		$ -	$ -	30	$ 75.00	$ 2,250.00	$ 2,250.00	
Demo skirting and siding	0	ea		$ -	$ -	60	$ 75.00	$ 4,500.00	$ 4,500.00	
Demo windows	0	ea		$ -	$ -	12	$ 75.00	$ 900.00	$ 900.00	
Roll off	2	ea	40 CY dumpster	$ 1,000.00	$ 2,000.00	0	$ 75.00	$ -	$ 2,000.00	
Frame new interior walls	1	ea	misc framing	$ 1,000.00	$ 1,000.00	35	$ 75.00	$ 2,625.00	$ 3,625.00	
Electrical	1	ea	Sub estimate	$ 27,450.00	$ 27,450.00	0	$ 75.00	$ -	$ 27,450.00	
Hang/tape/texture new walls	1	ea		$ 1,500.00	$ 1,500.00	80	$ 75.00	$ 6,000.00	$ 7,500.00	
Patch old flooring after wall demo	1	ea		$ 500.00	$ 500.00	10	$ 75.00	$ 750.00	$ 1,250.00	
Install new kitchen	1	ea	Rough estimate	$ 2,200.00	$ 2,200.00	16	$ 75.00	$ 1,200.00	$ 3,400.00	
Install new interior accessories	1	ea	Rough estimate	$ 800.00	$ 800.00	18	$ 75.00	$ 1,350.00	$ 2,150.00	
New windows installed	9	ea		$ 300.00	$ 2,700.00	20	$ 75.00	$ 1,500.00	$ 4,200.00	
Install new exterior door	2	ea	door & hardware	$ 400.00	$ 800.00	6	$ 75.00	$ 450.00	$ 1,250.00	
Interior trim windows/doors	1	ea		$ 600.00	$ 600.00	20	$ 75.00	$ 1,500.00	$ 2,100.00	
Install new insulation and siding	2200	sf		$ 4.20	$ 9,240.00	200	$ 75.00	$ 15,000.00	$ 24,240.00	
Install temp walls for shipping	1	lot	re-use wall framing for truss bracing	$ 1,000.00	$ 1,000.00	20	$ 75.00	$ 1,500.00	$ 2,500.00	
Separate modules by 3'	0	ea		$ -	$ -	50	$ 75.00	$ 3,750.00	$ 3,750.00	
Remove existing roofing	0	ea		$ -	$ -	40	$ 75.00	$ 3,000.00	$ 3,000.00	
Remove roof framing	0	ea		$ -	$ -	80	$ 75.00	$ 6,000.00	$ 6,000.00	
Install temp sheathing	1	ea		$ 1,000.00	$ 1,000.00	20	$ 75.00	$ 1,500.00	$ 2,500.00	
Shrink wrap module	2	ea		$ 1,750.00	$ 3,500.00	0	$ 75.00	$ -	$ 3,500.00	
Load module and transport to dock	2	ea		$ 2,500.00	$ 5,000.00	20	$ 75.00	$ 1,500.00	$ 6,500.00	
Move mods to Seward via rail	2	ea		$ 2,200.00	$ 4,400.00	0	$ 75.00	$ -	$ 4,400.00	
Barge modules to Metarvik	2	ea		$ 14,000.00	$ 28,000.00	0	$ 75.00	$ -	$ 28,000.00	
Install foundations in Metarvik	1	lot	barging only	$ 1,000.00	$ 1,000.00	0	$ 75.00	$ -	$ 1,000.00	
Set modules on foundations	2	ea		$ 1,000.00	$ 2,000.00	75	$ 75.00	$ 5,625.00	$ 7,625.00	
Install bearing plates on modules	2	ea		$ 500.00	$ 1,000.00	50	$ 75.00	$ 3,750.00	$ 4,750.00	
Install trusses and sheathing	1	ea	mtl	$ 6,000.00	$ 6,000.00	80	$ 75.00	$ 6,000.00	$ 12,000.00	
Construct vestibules and stairs	1	ea		$ 2,500.00	$ 2,500.00	40	$ 75.00	$ 3,000.00	$ 5,500.00	
Complete siding	1	ea		$ 1,000.00	$ 1,000.00	50	$ 75.00	$ 3,750.00	$ 4,750.00	
Install metal roofing	2	ea		$ 2,400.00	$ 4,800.00	70	$ 75.00	$ 5,250.00	$ 10,050.00	
Install Toyo stoves	2	ea		$ 1,500.00	$ 3,000.00	12	$ 75.00	$ 900.00	$ 3,900.00	
Install fuel tanks for toyos	1	ea		$ 1,500.00	$ 1,500.00	8	$ 75.00	$ 600.00	$ 2,100.00	
Install earth anchors and hdwr	6	ea		$ 200.00	$ 1,200.00	24	$ 75.00	$ 1,800.00	$ 3,000.00	
Install batt insulation	2000	sf		$ 0.80	$ 1,600.00	24	$ 75.00	$ 1,800.00	$ 3,400.00	
Install rigid and OSB under floor	2000	sf		$ 2.25	$ 4,500.00	55	$ 75.00	$ 4,125.00	$ 8,625.00	
	0	ea		$ -	$ -	0	$ 75.00	$ -	$ -	
GCs inc flights, housing, equip, etc	1	ea		$ 44,000.00	$ 44,000.00	60	$ 75.00	$ 4,500.00	$ 48,500.00	
	0	ea		$ -	$ -	0	$ 75.00	$ -	$ -	
OH	1	ea		$ 18,000.00	$ 18,000.00	0	$ 75.00	$ -	$ 18,000.00	
	0	ea		$ -	$ -	0	$ 75.00	$ -	$ -	
P	1	ea		$ 18,000.00	$ 18,000.00	0	$ 75.00	$ -	$ 18,000.00	
	0	ea		$ -	$ -	0	$ 75.00	$ -	$ -	
Contingency	1	ea	variation from current assumptions	$ 30,000.00	$ 30,000.00	0	$ 75.00	$ -	$ 30,000.00	
Bond	1	ea		$ 4,950.00	$ 4,950.00	0	$ 75.00	$ -	$ 4,950.00	
	0	ea		$ -	$ -	0	$ 75.00	$ -	$ -	
	0	ea		$ -	$ -	0	$ 75.00	$ -	$ -	
	0	ea		$ -	$ -	0	$ 75.00	$ -	$ -	
	0	ea		$ -	$ -	0	$ 75.00	$ -	$ -	
	0	ea		$ -	$ -	0	$ 75.00	$ -	$ -	
TOTALS						1285			**$333,115.00**	

Storage modules	qty	unit	material description or comments	cost / unit mat/equip	extended mat cost	man hours	labor rate	labor total	total	sub totals
disconnect and separate module	0	ea			0.00	20	$ 75.00	$1,500.00	$1,500.00	
Use siding from demo to patch module	1	ea	mis flashings	200.00	200.00	20	$ 75.00	$1,500.00	$1,700.00	
Demo interior of module	0	ea			0.00	8	$ 75.00	$600.00	$600.00	
waste disposal	1	ea		200.00	200.00	0	$ 75.00	$0.00	$200.00	
load/transport module to rail	1	ea		750.00	750.00	0	$ 75.00	$0.00	$750.00	
transport module to Seward	1	ea		750.00	750.00	0	$ 75.00	$0.00	$750.00	
barge module to Mertarvik	1	ea		8000.00	8000.00	0	$ 75.00	$0.00	$8,000.00	
Offload and set module on foundation	1	ea		750.00	750.00	30	$ 75.00	$2,250.00	$3,000.00	
	0	lot			0.00	0	$ 75.00	$0.00	$0.00	
	0	ea			0.00	0	$ 75.00	$0.00	$0.00	
OH	1	ea		1000.00	1000.00	0	$ 75.00	$0.00	$1,000.00	
P	1	ea		1000.00	1000.00	0	$ 75.00	$0.00	$1,000.00	
Contingency	1	ea		1000.00	1000.00	0	$ 75.00	$0.00	$1,000.00	
bond	1	ea		200.00	200.00	0	$ 75.00	$0.00	$200.00	
	0	ea			0.00	0	$ 75.00	$0.00	$0.00	
	0	ea			0.00	0	$ 75.00	$0.00	$0.00	
	0	ea			0.00	0	$ 75.00	$0.00	$0.00	
TOTALS					0.00	78		$2,250.00	**$19,700.00**	

IF THIS DIMENSION DOES NOT MEASURE ONE INCH (1") EXACTLY, THIS DRAWING HAS BEEN ENLARGED OR REDUCED, AFFECTING ALL LABELED SCALES

1" ACTUAL



1 AD111 FLOOR PLAN - DEMOLITION - 2 BEDROOM OPTION
1/4" = 1'-0"

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BETTISWORTH NORTH
ARCHITECTURE PLANNING LANDSCAPE INTERIORS

CORPORATE NO. AECC219 WWW. BETTISWORTHNORTH.COM

VILLAGE OF MERTARVIK
HOUSING REPLACEMENT
MERTARVIK, ALASKA

CONSULTANT:

PROJECT NO:	17-159
DATE:	2017-08-23
DRAWN BY:	Author
CHECKED BY:	Checker

SYMBOL	DESCRIPTION	DATE

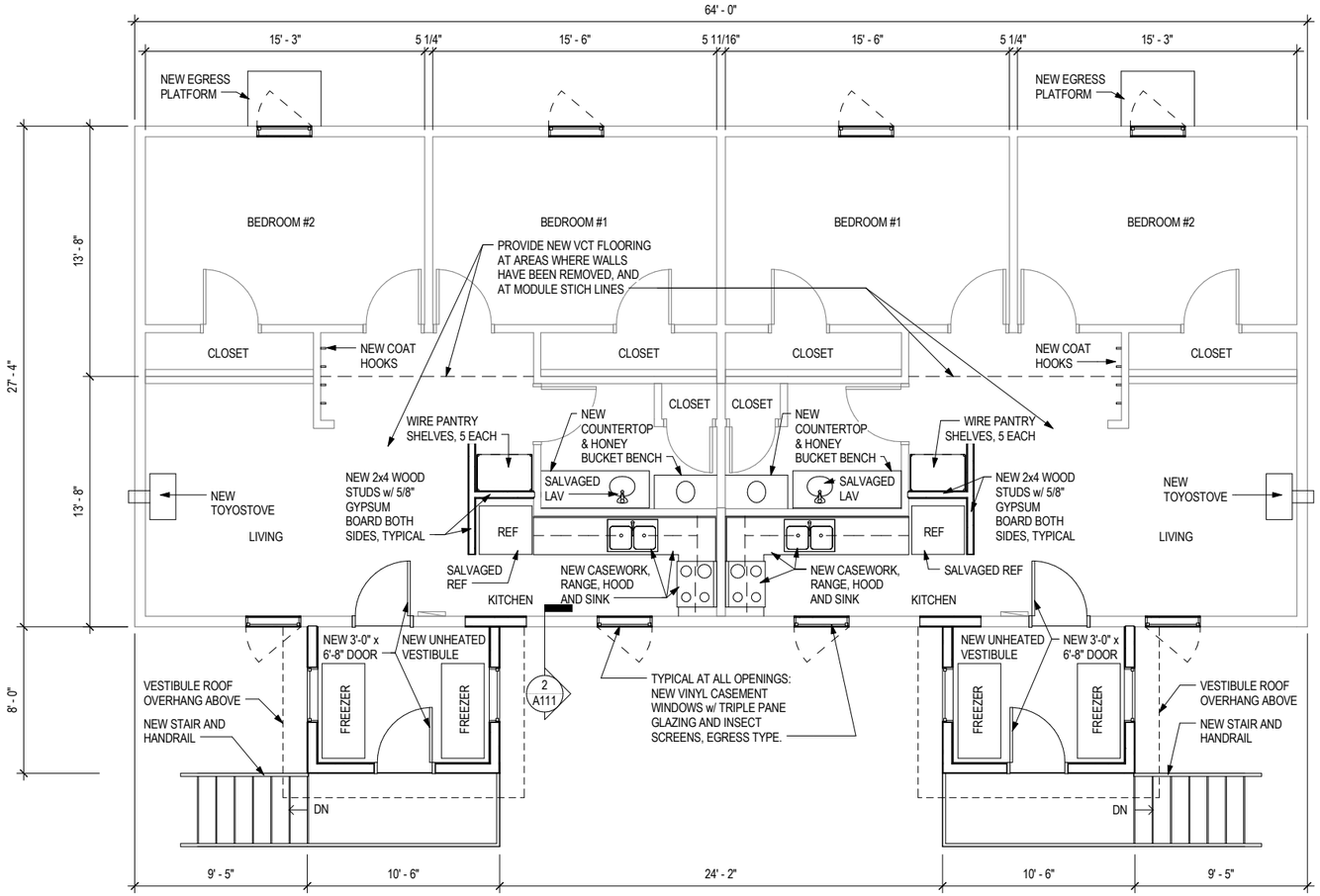
NOT FOR CONSTRUCTION

FLOOR PLAN - DEMOLITION - 2 BDRM OPTION

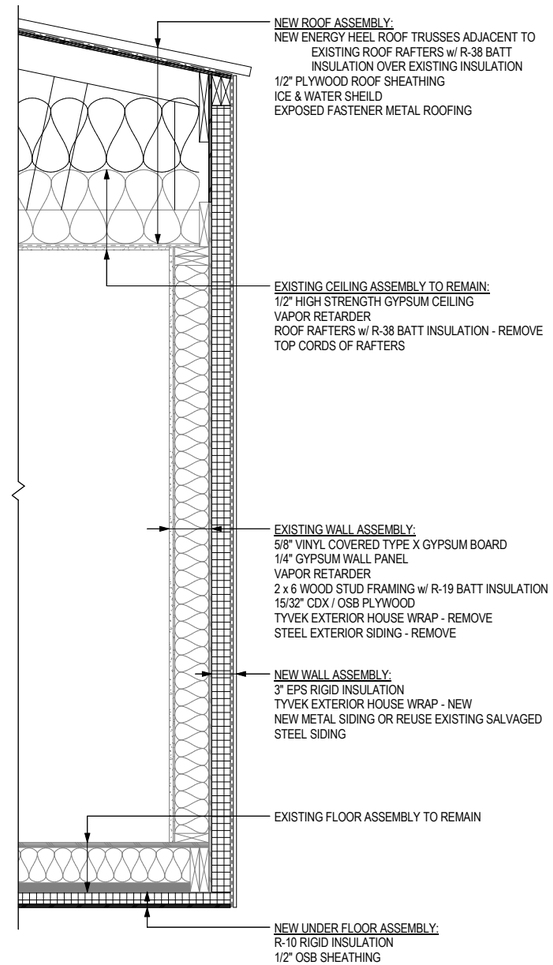
AD111

IF THIS DIMENSION DOES NOT MEASURE ONE INCH (1") EXACTLY, THIS DRAWING HAS BEEN ENLARGED OR REDUCED, AFFECTING ALL LABELED SCALES

1" ACTUAL



1 A111 FLOOR PLAN - NEW CONSTRUCTION - 2 BEDROOM OPTION
1/4" = 1'-0"



2 A111 TYPICAL EXTERIOR WALL SECTION
1" = 1'-0"

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ARCHITECTURE PLANNING LANDSCAPE INTERIORS

CORPORATE NO. AECC219 WWW. BETTISWORTHNORTH.COM

VILLAGE OF MERTARVIK
HOUSING REPLACEMENT
MERTARVIK, ALASKA

CONSULTANT:

PROJECT NO:	17-159
DATE:	2017-08-23
DRAWN BY:	Author
CHECKED BY:	Checker

SYMBOL	DESCRIPTION	DATE

NOT FOR CONSTRUCTION

FLOOR PLAN - NEW CONSTRUCTION - 2 BDRM OPTION

A111

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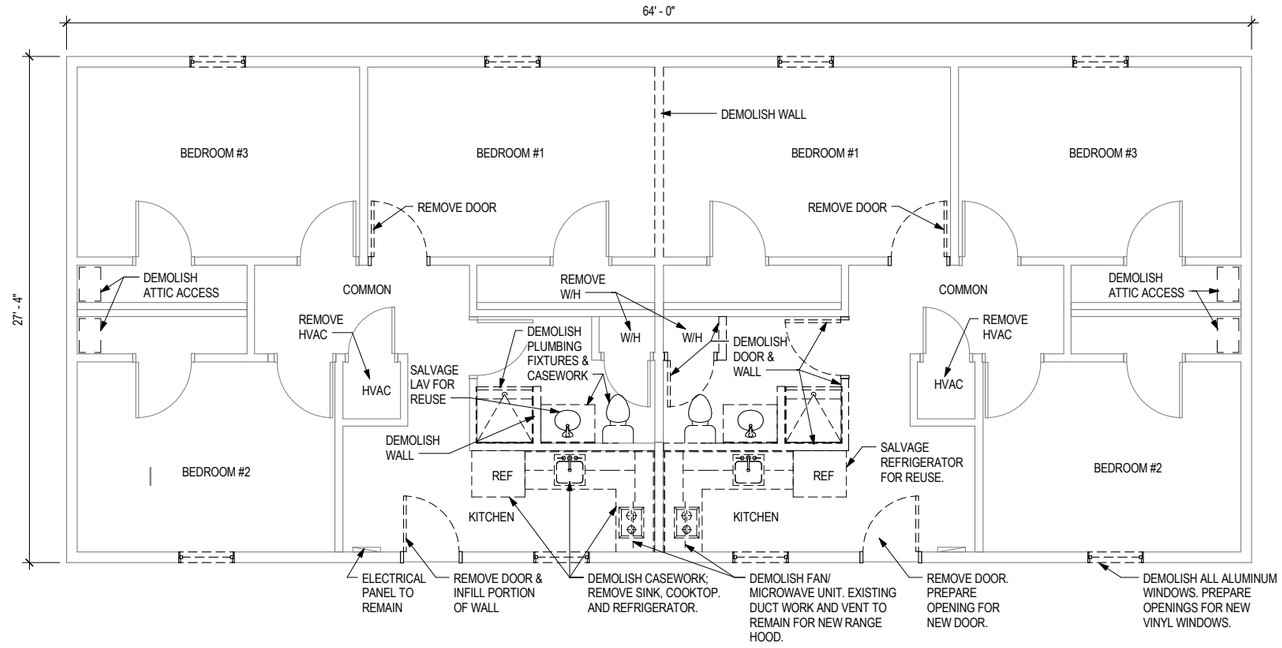
1" ACTUAL



1 AD112 FLOOR PLAN - DEMOLITION - 4 BEDROOM OPTION
1/4" = 1'-0"

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ARCHITECTURE PLANNING LANDSCAPE INTERIORS
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VILLAGE OF MERTARVIK
HOUSING REPLACEMENT
MERTARVIK, ALASKA

CONSULTANT:

PROJECT NO:	17-159
DATE:	2017-08-23
DRAWN BY:	Author
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SYMBOL	DESCRIPTION	DATE

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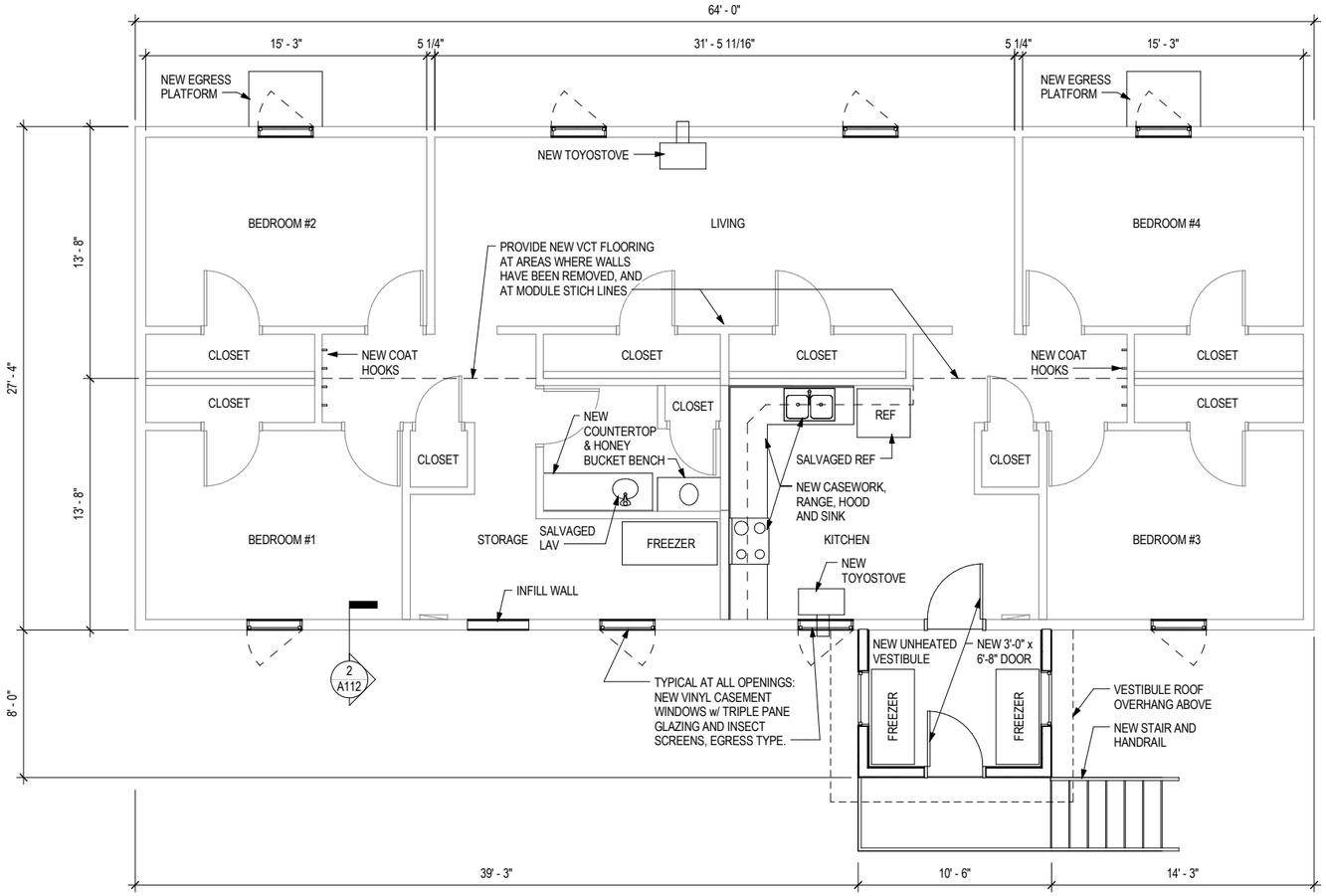
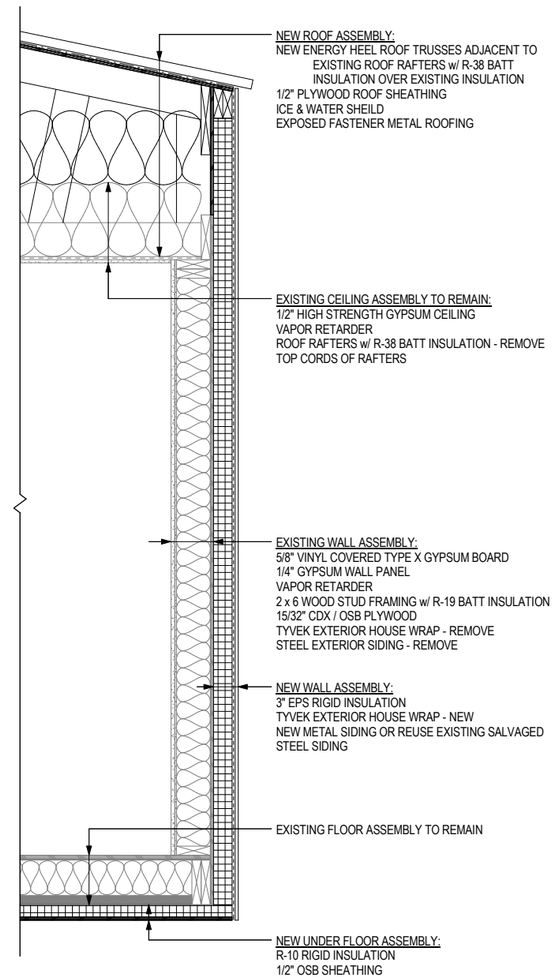
FLOOR PLAN - DEMOLITION - 4 BDRM OPTION

AD112



1 A112 FLOOR PLAN - NEW CONSTRUCTION - 4 BEDROOM OPTION
1/4" = 1'-0"



2 A112 TYPICAL EXTERIOR WALL SECTION
1" = 1'-0"

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ARCHITECTURE PLANNING LANDSCAPE INTERIORS
CORPORATE NO. AECC219 WWW. BETTISWORTHNORTH.COM

VILLAGE OF MERTARVIK
HOUSING REPLACEMENT
MERTARVIK, ALASKA

CONSULTANT:

PROJECT NO:	17-159
DATE:	2017-08-23
DRAWN BY:	Author
CHECKED BY:	Checker

SYMBOL	DESCRIPTION	DATE

NOT FOR CONSTRUCTION

FLOOR PLAN - NEW CONSTRUCTION - 4 BDRM OPTION

A112

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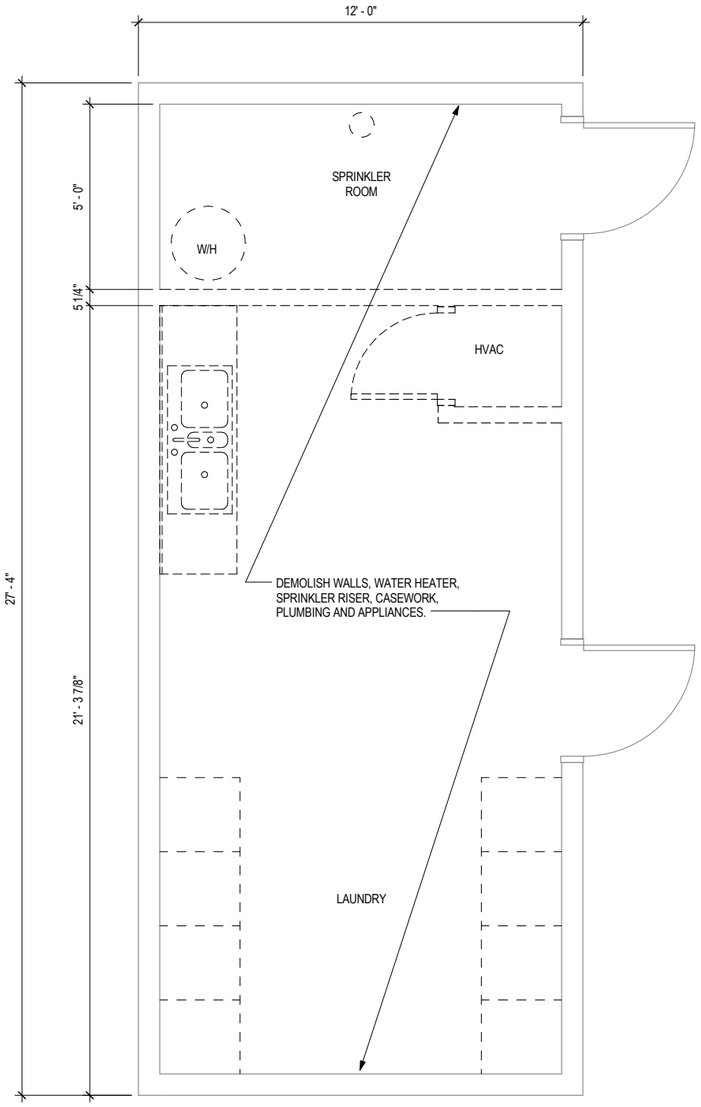
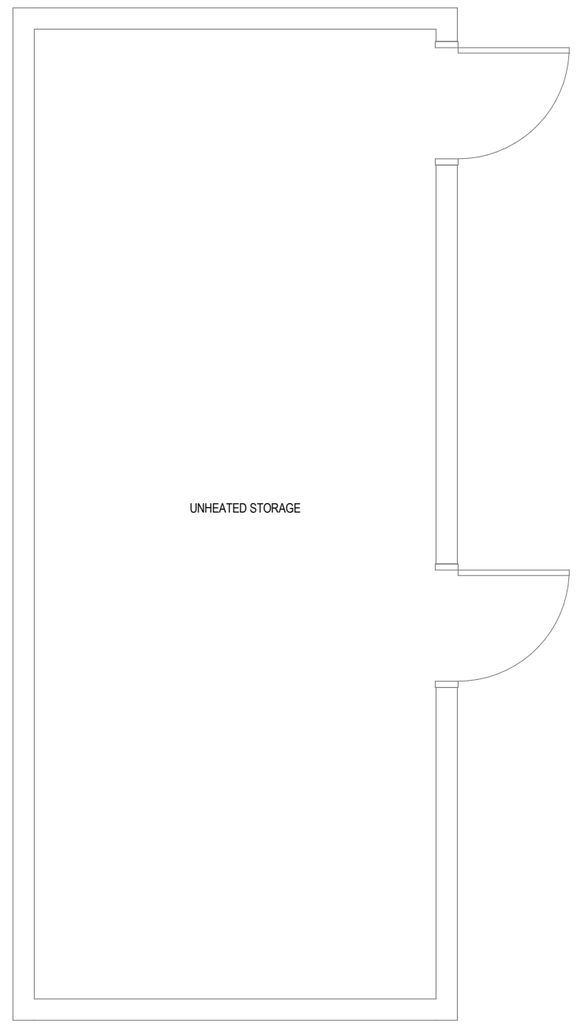
1" ACTUAL



1 AD113 FLOOR PLAN - DEMOLITION - LAUNDRY MODULE OPTION
1/2" = 1'-0"



2 AD113 FLOOR PLAN - UNHEATED STORAGE OPTION
1/2" = 1'-0"

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BETTISWORTH NORTH
ARCHITECTURE PLANNING LANDSCAPE INTERIORS

CORPORATE NO. AECC219 WWW. BETTISWORTHNORTH.COM

VILLAGE OF MERTARVIK
HOUSING REPLACEMENT
MERTARVIK, ALASKA

CONSULTANT:

PROJECT NO:	17-159
DATE:	2017-08-23
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SYMBOL	DESCRIPTION	DATE

NOT FOR CONSTRUCTION

LAUNDRY MODULE OPTION

AD113

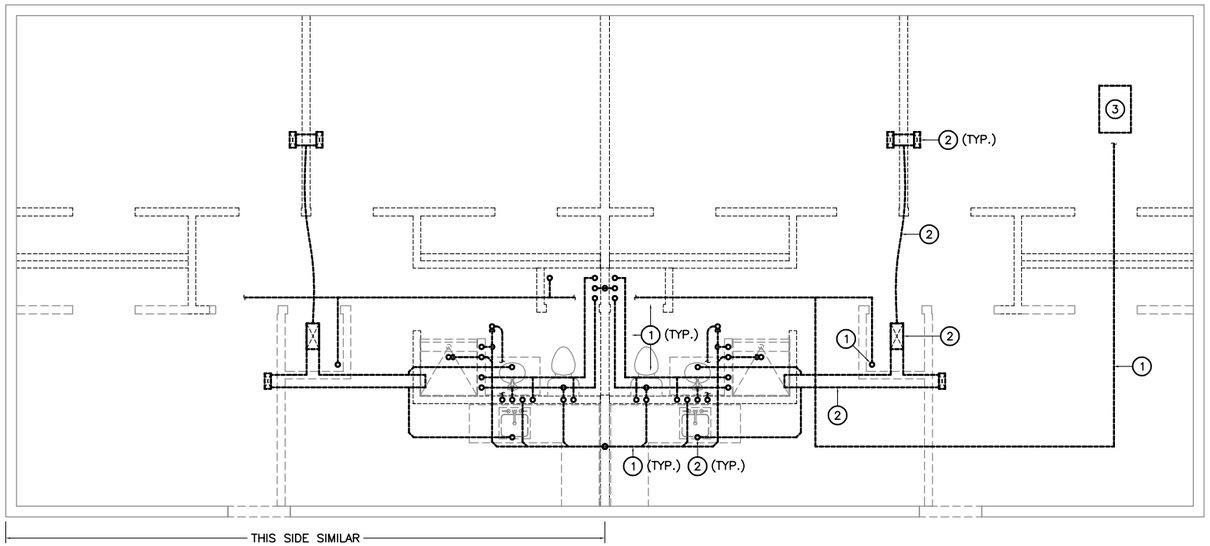
IF THIS DIMENSION DOES NOT MEASURE ONE INCH (1") EXACTLY, THIS DRAWING HAS BEEN ENLARGED OR REDUCED, AFFECTING ALL LABELED SCALES — 1" ACTUAL

MECHANICAL LEGEND

- DENOTES DEMOLITION
- WASTE
- VENT PIPING
- COLD WATER
- HOT WATER
- XXX — SEE ABBREVIATIONS FOR MEDIA
- PIPE UP
- PIPE DOWN
- TEE UP
- TEE DOWN
- CAP
- UNION
- BALL VALVE
- CHECK VALVE
- FLEXIBLE PIPING CONNECTOR
- HOSE BIBB
- PUMP
- FLOOR DRAIN
- POINT OF CONNECTION
- SUPPLY AIR UP & DOWN (SQUARE) / SUPPLY AIR DIFFUSER / GRILLE
- RETURN AIR UP & DOWN (SQUARE) / RETURN AIR GRILLE
- EXHAUST AIR UP & DOWN (SQUARE) / EXHAUST AIR GRILLE
- ROUND DUCT UP & DOWN
- THERMOSTAT OR SENSOR
- 1 / M1 — DETAIL NUMBER / SHEET LOCATED ON
- 1 — SHEET NOTES

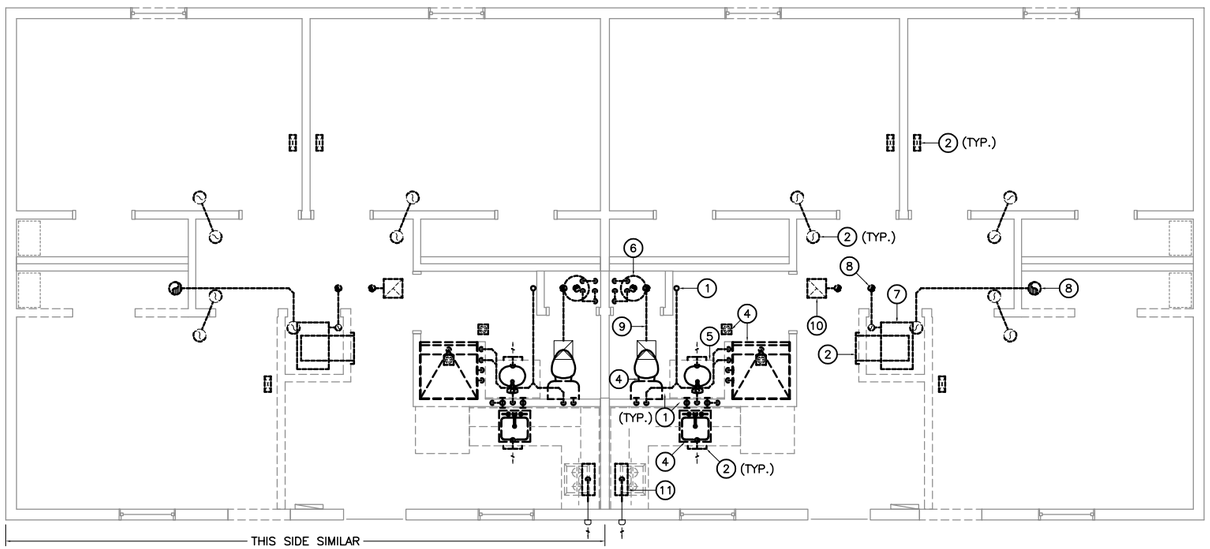
ABBREVIATIONS

AAV	AUTOMATIC AIR VENT
AFF	ABOVE FINISHED FLOOR
AMPS	AMPERES
ARCH	ARCHITECTURAL
BDD	BACKDRAFT DAMPER
BTUH	BRITISH THERMAL UNIT / HOUR
C/A	COMBUSTION AIR
CFM	CUBIC FEET PER MINUTE
CW	COLD WATER
ø	DIAMETER
dB	DECIBELS
DEG	DEGREE
DN	DOWN
E/A	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EF	EXHAUST FAN
EXIST	EXISTING
FT	FEET
F	FAHRENHEIT
G	NATURAL GAS
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
HW	HOT WATER
HWC	HOT WATER CIRCULATED
ID	INSIDE DIAMETER
IN	INCHES
LAT	LEAVING AIR TEMPERATURE
MAX	MAXIMUM
MBH	THOUSAND BTU PER HOUR
MFGR	MANUFACTURER
MIN	MINIMUM
NC	NOISE CRITERIA
NTS	NOT TO SCALE
O/A	OUTSIDE AIR
PH	PHASE
PSI	POUNDS PER INCH
R/A	RETURN AIR
S/A	SUPPLY AIR
SP	STATIC PRESSURE
T/A	TRANSFER AIR
TEMP	TEMPERATURE
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TYP	TYPICAL
V	VENT
VTR	VENT THRU ROOF
W	WASTE
W/	WITH
W/O	WITHOUT



1 / M001 — 2-BEDROOM UNDERFLOOR MECHANICAL DEMOLITION PLAN

SCALE: 1/4" = 1'-0"



2 / M001 — 2-BEDROOM FIRST FLOOR MECHANICAL DEMOLITION PLAN

SCALE: 1/4" = 1'-0"

SHEET NOTES

1. REMOVE EXISTING SPRINKLER SYSTEM IN ITS ENTIRETY.
2. REMOVE ALL MECHANICAL ROOF PENETRATIONS.
3. REMOVE INDICATED EQUIPMENT, PIPING, DUCTWORK, AND ANCILLARY DEVICES. PATCH AND REPAIR FORMER ROOF, CEILING, WALL, AND FLOOR PENETRATIONS TO MATCH EXISTING.

KEY NOTES

1. REMOVE NATURAL GAS, COLD WATER, HOT WATER, WASTE, AND VENT PIPING LOCATED UNDERFLOOR AND IN THE ATTIC IN THEIR ENTIRETY. PIPING LOCATED IN REMAINING WALLS SHALL BE ABANDONED AND CAPPED IN A CONCEALED LOCATION.
2. REMOVE EXISTING DUCTWORK, GRILLES, REGISTERS, AND DIFFUSERS.
3. REMOVE EXISTING UNDERFLOOR FURNACE, DUCTWORK, AND ANCILLARY DEVICES IN THEIR ENTIRETY.
4. REMOVE EXISTING PLUMBING FIXTURE AND ASSOCIATED PIPING.
5. REMOVE AND RETAIN LAVATORY FOR REUSE.
6. REMOVE EXISTING WATER HEATER AND ANCILLARY DEVICES IN THEIR ENTIRETY.
7. REMOVE EXISTING FURNACE AND ANCILLARY DEVICES IN THEIR ENTIRETY.
8. REMOVE EXISTING FURNACE VENT, COMBUSTION AIR PIPING, AND ROOF TERMINATIONS IN THEIR ENTIRETY.
9. REMOVE EXISTING EXHAUST DUCTWORK AND ROOF TERMINATION TO EXTENT REQUIRED FOR NEW CONFIGURATION.
10. REMOVE EXHAUST FAN, DUCTWORK, ROOF TERMINATION, AND ANCILLARY DEVICES IN THEIR ENTIRETY.
11. REMOVE EXISTING RANGE HOOD AND DUCTWORK TO EXTENT REQUIRED FOR NEW CONFIGURATION.

BETTISWORTH NORTH
ARCHITECTURE PLANNING LANDSCAPE INTERIORS

CORPORATE NO. AECC219 WWW. BETTISWORTHNORTH.COM

VILLAGE OF MERTARVIK
HOUSING REPLACEMENT
MERTARVIK, ALASKA

CHECK SET

CONSULTANT:

HZA
ENGINEERING SOLUTIONS
HZA Engineering, LLC
113 W. Northern Lights Blvd., Suite 240
Anchorage, Alaska 99503
Tel. (907) 562-1012 Fax (907) 562-1013
AK Corporation #: AECL881

PROJECT NO:	2017.045.0
DATE:	2017-08-23
DRAWN BY:	MS
CHECKED BY:	CCH

SYMBOL	DESCRIPTION	DATE

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LEGEND, SCHEDULES, AND 2-BEDROOM MECHANICAL DEMOLITION PLANS

M001

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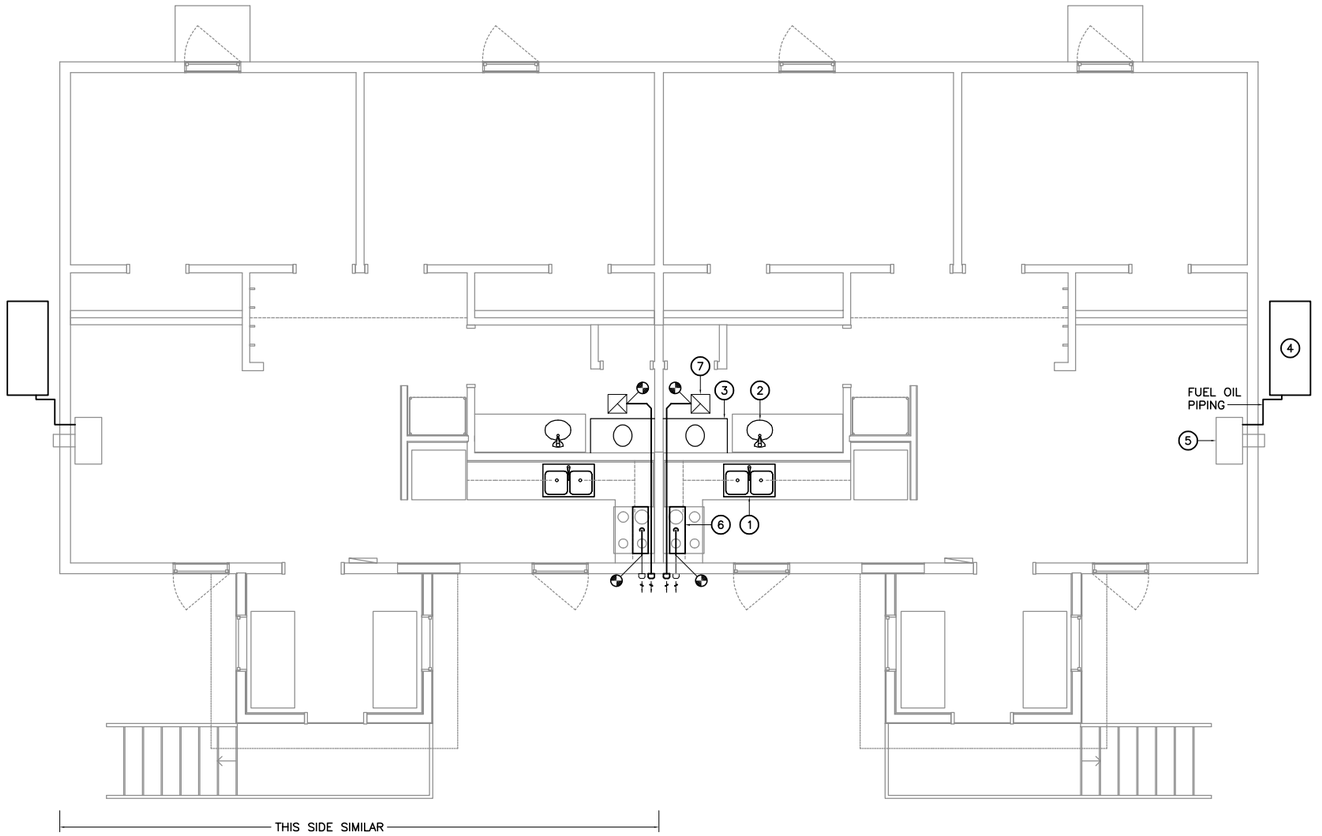

SHEET NOTES

1. PATCH AND REPAIR FORMER ROOF, CEILING, WALL, AND FLOOR PENETRATIONS TO MATCH EXISTING.

KEY NOTES

1. NEW 2–COMPARTMENT SINK, DRAIN TO BUCKET BELOW.
2. PREVIOUSLY REMOVED LAVATORY INSTALLED IN NEW CASEWORK, DRAIN TO BUCKET BELOW.
3. HONEYBUCKET BENCH, SEE ARCHITECTURAL.
4. 300 GALLON FUEL OIL TANK AND STAND.
5. TOYOTOMI L–73 FUEL OIL FIRED HEATER.
6. NEW RANGE HOOD, CONNECT TO EXISTING EXHAUST DUCTWORK AND WALL CAP.
7. EXISTING EXHAUST FAN, ROUTE NEW DUCTWORK TO EXTERIOR WALL AS INDICATED.

1 / M002 2-BEDROOM MECHANICAL RENOVATION PLAN

SCALE: 1/4" = 1'-0"

BETTISWORTH NORTH
ARCHITECTURE PLANNING LANDSCAPE INTERIORS

CORPORATE NO. AECC219 WWW. BETTISWORTHNORTH.COM

VILLAGE OF MERTARVIK
HOUSING REPLACEMENT
MERTARVIK, ALASKA

CHECK SET

CONSULTANT:

HZA
ENGINEERING SOLUTIONS
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113 W. Northern Lights Blvd., Suite 240
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AK Corporation #: AECL881

PROJECT NO:	2017.045.0
DATE:	2017-08-23
DRAWN BY:	MS
CHECKED BY:	CCH

SYMBOL	DESCRIPTION	DATE

NOT FOR CONSTRUCTION

2-BEDROOM MECHANICAL RENOVATION PLAN

M002

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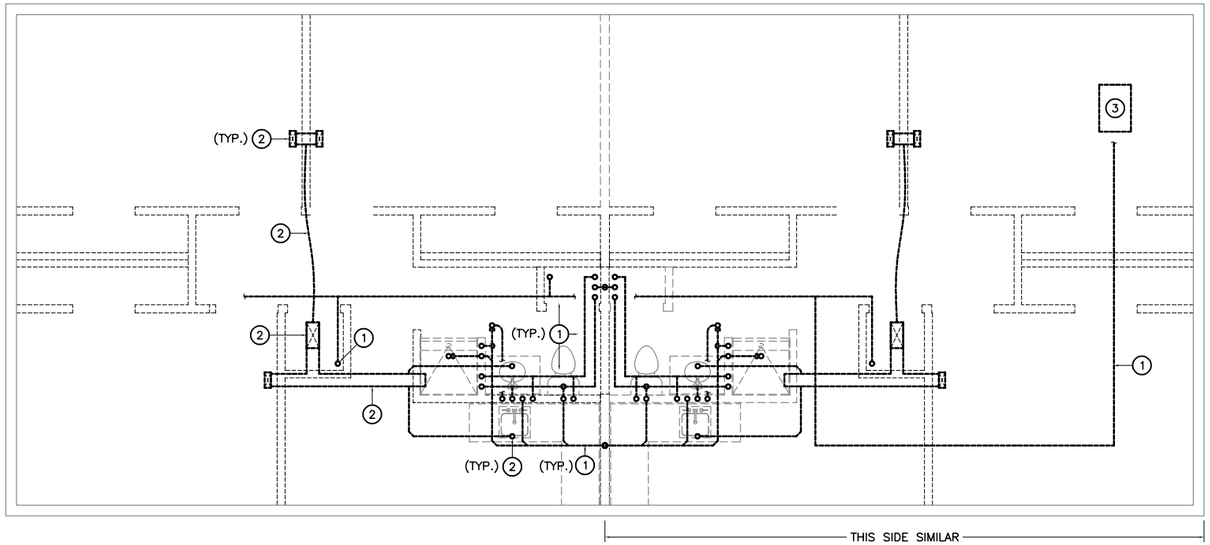
1" ACTUAL



1 M003 4-BEDROOM UNDERFLOOR MECHANICAL DEMOLITION PLAN

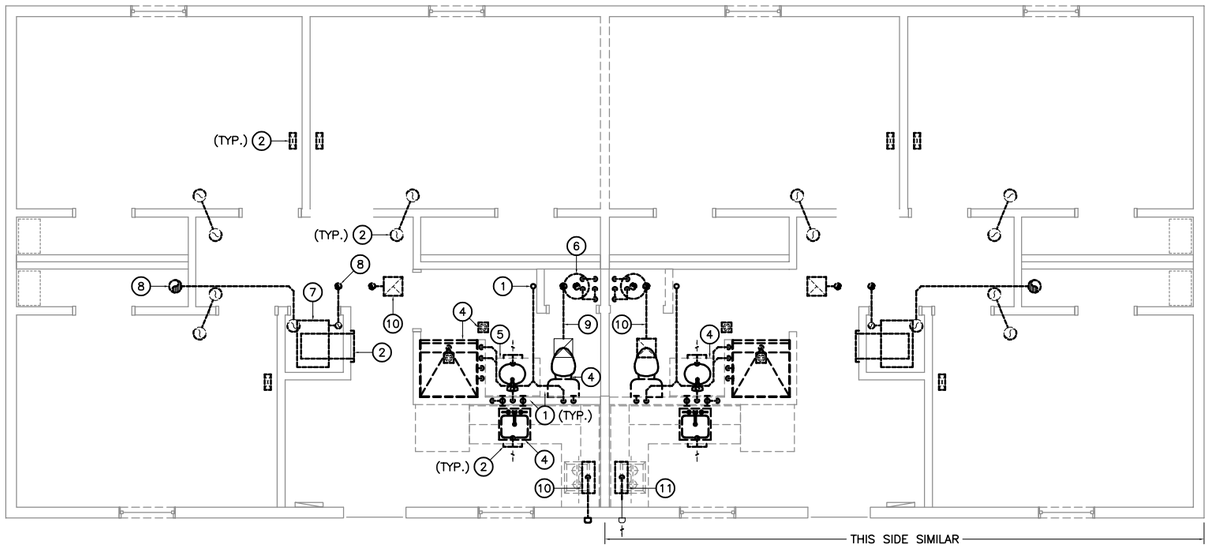
SCALE: 1/4" = 1'-0"

SHEET NOTES

1. REMOVE EXISTING SPRINKLER SYSTEM IN ITS ENTIRETY.
2. REMOVE ALL MECHANICAL ROOF PENETRATIONS.
3. REMOVE INDICATED EQUIPMENT, PIPING, DUCTWORK, AND ANCILLARY DEVICES. PATCH AND REPAIR FORMER ROOF, CEILING, WALL, AND FLOOR PENETRATIONS TO MATCH EXISTING.

KEY NOTES

1. REMOVE NATURAL GAS, COLD WATER, HOT WATER, WASTE, AND VENT PIPING LOCATED UNDERFLOOR AND IN THE ATTIC IN THEIR ENTIRETY. PIPING LOCATED IN REMAINING WALLS SHALL BE ABANDONED AND CAPPED IN A CONCEALED LOCATION.
2. REMOVE EXISTING DUCTWORK, GRILLES, REGISTERS, AND DIFFUSERS.
3. REMOVE EXISTING UNDERFLOOR FURNACE, DUCTWORK, AND ANCILLARY DEVICES IN THEIR ENTIRETY.
4. REMOVE EXISTING PLUMBING FIXTURE AND ASSOCIATED PIPING.
5. REMOVE AND RETAIN LAVATORY FOR REUSE.
6. REMOVE EXISTING WATER HEATER AND ANCILLARY DEVICES IN THEIR ENTIRETY.
7. REMOVE EXISTING FURNACE AND ANCILLARY DEVICES IN THEIR ENTIRETY.
8. REMOVE EXISTING FURNACE VENT, COMBUSTION AIR PIPING, AND ROOF TERMINATIONS IN THEIR ENTIRETY.
9. REMOVE EXISTING EXHAUST DUCTWORK AND ROOF TERMINATION TO EXTENT REQUIRED FOR NEW CONFIGURATION.
10. REMOVE EXHAUST FAN, DUCTWORK, EXTERIOR TERMINATION, AND ANCILLARY DEVICES IN THEIR ENTIRETY.
11. REMOVE EXISTING RANGE HOOD AND DUCTWORK TO EXTENT REQUIRED FOR NEW CONFIGURATION.



2 M003 4-BEDROOM FIRST FLOOR MECHANICAL DEMOLITION PLAN

SCALE: 1/4" = 1'-0"

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4-BEDROOM MECHANICAL DEMOLITION PLANS

M003

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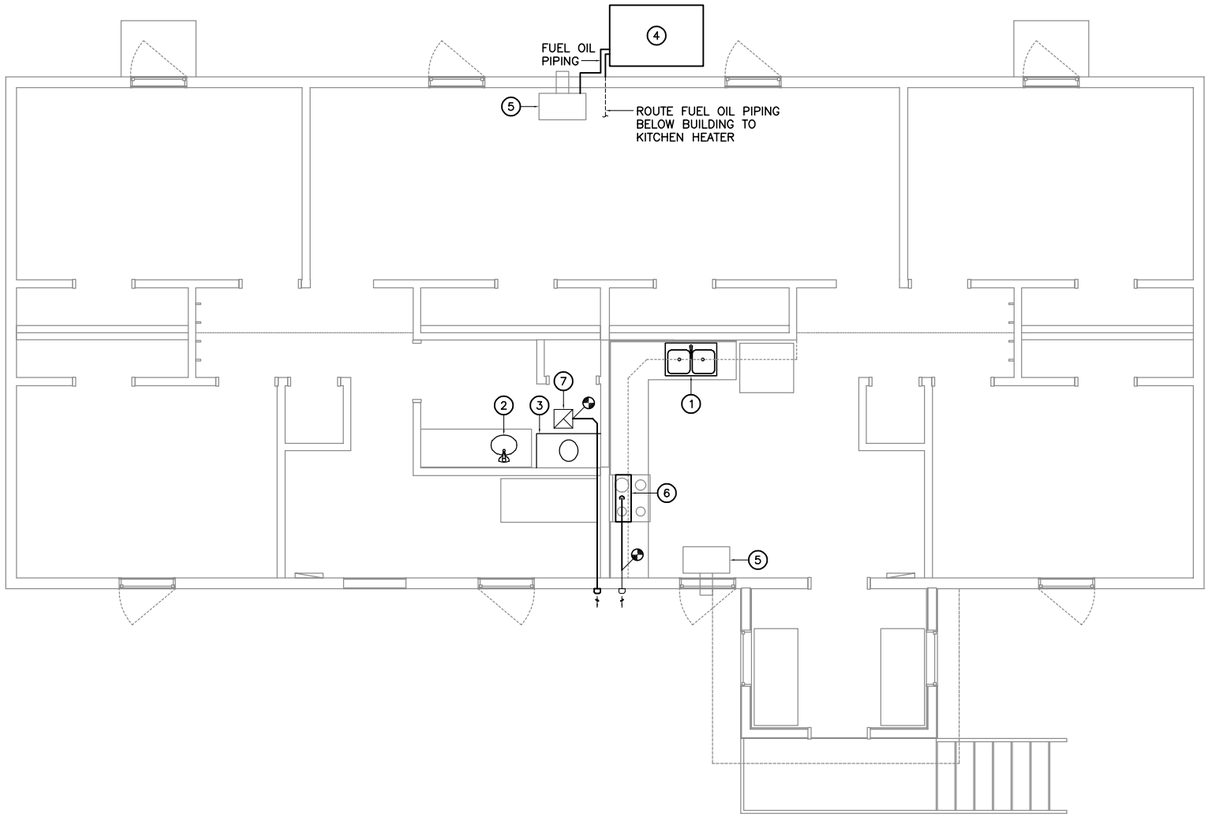

SHEET NOTES

1. PATCH AND REPAIR FORMER ROOF, CEILING, WALL, AND FLOOR PENETRATIONS TO MATCH EXISTING.

KEY NOTES

1. NEW 2–COMPARTMENT SINK, DRAIN TO BUCKET BELOW.
2. PREVIOUSLY REMOVED LAVATORY INSTALLED IN NEW CASEWORK, DRAIN TO BUCKET BELOW.
3. HONEYBUCKET BENCH, SEE ARCHITECTURAL.
4. 500 GALLON FUEL OIL TANK AND STAND.
5. TOYOTOMI L–73 FUEL OIL FIRED HEATER.
6. NEW RANGE HOOD, CONNECT TO EXISTING EXHAUST DUCTWORK AND WALL CAP.
7. EXISTING EXHAUST FAN, ROUTE NEW DUCTWORK TO EXTERIOR WALL AS INDICATED.

1 / M004 4-BEDROOM MECHANICAL RENOVATION PLAN

SCALE: 1/4" = 1'-0"

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4-BEDROOM MECHANICAL RENOVATION PLAN

M004

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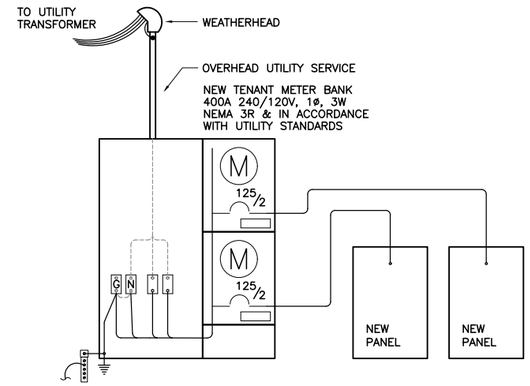
ELECTRICAL SYMBOLS LEGEND

	LIGHT FIXTURE – SURFACE WALL MOUNTED		PANEL
	LIGHT FIXTURE – SURFACE MOUNTED		DUPLEX RECEPTACLE
	LIGHT FIXTURE – 4' SURFACE/PENDANT MOUNTED		GROUND FAULT CURRENT INTERRUPTER RECEPTACLE
	LIGHT FIXTURE – WALL MOUNTED		QUADRAPLEX RECEPTACLE
	LIGHT STRIP FIXTURE – SURFACE MOUNTED		SPECIAL PURPOSE RECEPTACLE
	EXIT SIGN – CEILING MOUNTED		JUNCTION BOX
	EXIT SIGN/EMERGENCY LIGHT – WALL MOUNTED		DISCONNECT SWITCH
	SELF–CONTAINED EMERGENCY LIGHT		FUSED DISCONNECT SWITCH
X	FIXTURE IDENTIFICATION (LETTER INDICATES TYPE)		COMBINATION MOTOR STARTER DISCONNECT
S	SINGLE POLE SWITCH	S_F	FRACTIONAL HP MOTOR SWITCH
S_3 S_4	THREE WAY SWITCH AND FOUR WAY SWITCH		MOTOR
	CONDUIT, CONCEALED		TELECOMMUNICATION OUTLET
#10	NUMBER AND SIZE OF WIRES (NO SLASHES = 3#12)		FA SMOKE DETECTOR
A–2	HOMERUN TO PANEL (PANEL AND CIRCUIT No.)	CO	CARBON MONOXIDE DETECTOR
X	NOTE TAG (No. INDICATES NOTE)	135°F	FA HEAT DETECTOR (FIXED TEMP. NOTED)
P	PHOTOCELL		DUCT MOUNTED SMOKE DETECTOR
	DASHED SYMBOL = DEVICE TO BE REMOVED		FA HORN STROBE
	LIGHT SYMBOL = EXISTING DEVICE TO REMAIN		FA MANUAL PULL STATION
	DARK SYMBOL = NEW DEVICE		BELL
TV	TELEVISION OUTLET	GF	GROUND FAULT CIRCUIT INTERRUPTER SUPPLIED FROM 5mA GFCI CIRCUIT BREAKER
WR	WEATHER RESISTANT TYPE		
WP	WEATHERPROOF WHILE–IN–USE	AC	ABOVE COUNTER – COORDINATE MOUNTING HEIGHTS AND LOCATIONS OF OUTLETS DENOTED AS ABOVE COUNTER TO BE INSTALLED 6" ABOVE COUNTERS OR BACKSPLASHES, WHICHEVER IS HIGHER
E	EXISTING FIXTURE OR DEVICE TO REMAIN		
EF	EXHAUST FAN		

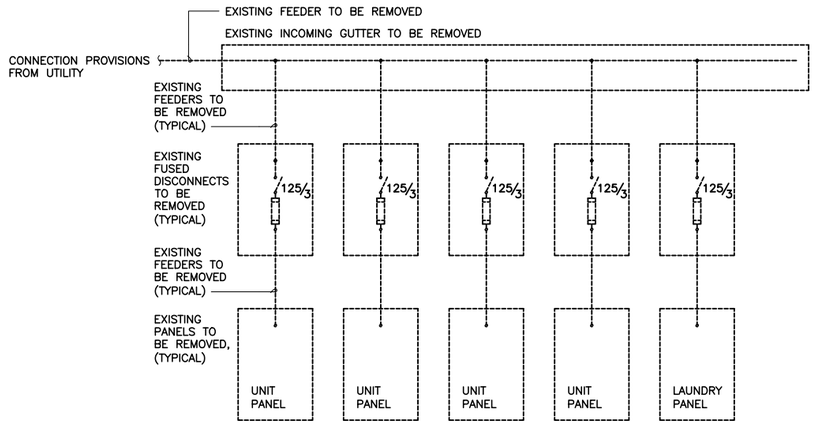
LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	LAMP		MOUNTING	
		TYPE	QUANTITY	TYPE	HEIGHT
A	RESIDENTIAL STYLE, INCANDESCENT SURFACE MOUNT FIXTURE WITH GLASS/ACRYLIC DIFFUSER/LENS AND DAMP LOCATION LISTING. PROVIDE WITH SCREW IN STYLE SELF BALLASTED LED REPLACEMENT LAMPS.	MEDIUM BASE LED (75W INC EQUIVALENT)	3	SURFACE	CEILING
B	RESIDENTIAL STYLE, SURFACE MOUNT, LINEAR LED FIXTURE WITH ACRYLIC DIFFUSER/LENS AND DAMP LOCATION LISTING.	LED		SURFACE	CEILING
C	RESIDENTIAL STYLE, INCANDESCENT SURFACE MOUNT FIXTURE WITH GLASS/ACRYLIC DIFFUSER/LENS AND DAMP LOCATION LISTING. PROVIDE WITH SCREW IN STYLE SELF BALLASTED LED REPLACEMENT LAMPS.	MEDIUM BASE LED (75W INC EQUIVALENT)	2	SURFACE	CEILING
D	RESIDENTIAL STYLE LED FIXTURE WITH COMPLETELY ENCLOSED LIGHT SOURCE. FIXTURE SHALL BE OF A TYPE COMPLIANT WITH NEC 410.16. FOR USE WITH IN A CLOSET SPACE.	LED		SURFACE	CEILING/ WALL
E	RESIDENTIAL STYLE, INCANDESCENT WALL MOUNT FIXTURE WITH GLASS/ACRYLIC DIFFUSER/LENS AND WET LOCATION LISTING. PROVIDE WITH SCREW IN STYLE SELF BALLASTED LED REPLACEMENT LAMPS.	MEDIUM BASE LED (75W INC EQUIVALENT)	2	WALL	ABOVE DOOR
F	RESIDENTIAL STYLE LED FIXTURE WITH COMPLETELY ENCLOSED LIGHT SOURCE. FIXTURE SHALL BE OF A TYPE COMPLIANT WITH NEC 410.16. FOR USE WITH IN A CLOSET SPACE.	LED		SURFACE	CEILING/ WALL



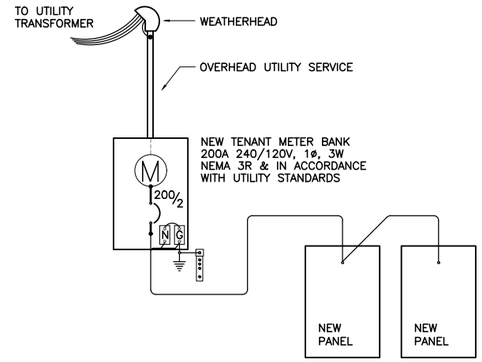
2 E001 ELECTRICAL DISTRIBUTION SYSTEM - REMODEL CONFIGURATION

SCALE: NOT TO SCALE — TYPICAL - 1 PER 2 BEDROOM UNIT



1 E001 ELECTRICAL DISTRIBUTION SYSTEM - DEMOLITION CONFIGURATION

SCALE: NOT TO SCALE — TYPICAL - 1 PER GROUP OF 4 MODULES



3 E001 ELECTRICAL DISTRIBUTION SYSTEM - REMODEL CONFIGURATION

SCALE: NOT TO SCALE — TYPICAL - 1 PER 4 BEDROOM UNIT

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ELECTRICAL
LEGEND, FIXTURE SCHEDULE,
AND DISTRIBUTION DIAGRAMS

E001

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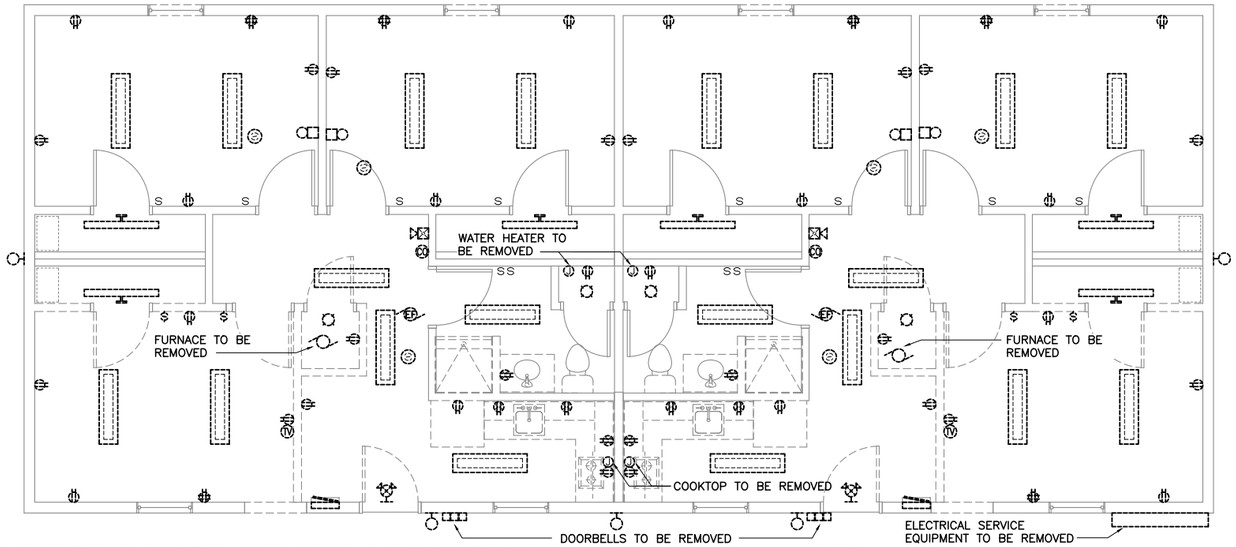
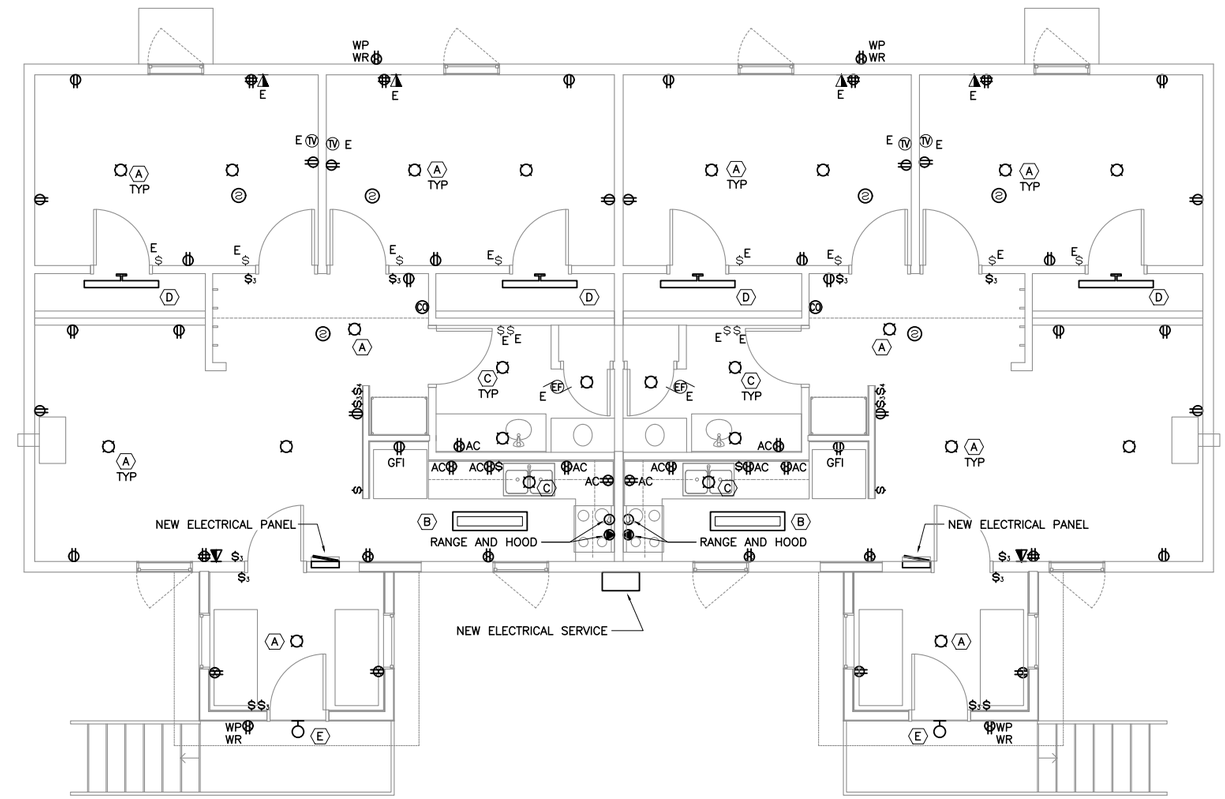


1 E101 LIGHTING, POWER, AND SIGNAL DEMOLITION PLAN - TWO BEDROOM UNIT

SCALE: 1/4" = 1'-0"



2 E101 LIGHTING, POWER, AND SIGNAL REMODEL PLAN - TWO BEDROOM UNIT

SCALE: 1/4" = 1'-0"

GENERAL NOTES

1. REMOVE EXISTING FIRE ALARM SYSTEM IN ITS ENTIRETY.
2. REMOVE ELECTRICAL ASSOCIATED WITH DEMOLITION OF MECHANICAL EQUIPMENT (FURNACES, WATER HEATERS, EXHAUST FANS, ETC). REFERENCE MECHANICAL DOCUMENTS.
3. REMOVE ELECTRICAL IN WALLS AND CEILINGS WHICH ARE TO BE REMOVED.
4. REMOVE EMERGENCY LIGHTS, EXIT SIGNS, AND ASSOCIATED ELECTRICAL.
5. REMOVE EXISTING ELECTRICAL DISCONNECTS, BOXES, CONDUITS AND CONDUCTORS ASSOCIATED WITH INCOMING POWER FEED ON THE EXTERIOR OF THE BUILDING. REPLACE NEW ELECTRICAL SERVICE EQUIPMENT, COMPATIBLE WITH THE SERVING UTILITY STANDARDS.
6. REPLACE EXISTING 120/208 VOLT, 3 PHASE PANELS WITH NEW 120/240 VOLT, SINGLE PHASE PANELS. RECONNECT TO EXISTING BRANCH CIRCUITRY. PROVIDE QUANTITY AND RATING OF CIRCUIT BREAKERS AS REQUIRED. ALL CIRCUIT BREAKERS ARE TO BE RATED FOR THE AVAILABLE FAULT CURRENT.
7. CIRCUIT BREAKERS ARE TO BE COMBINATION ARC FAULT TYPE WHERE REQUIRED BY THE NEC (210.12).
8. REMOVE AND REPLACE ALL EXISTING RECEPTACLES WITH NEW TAMPER RESISTANT TYPE RECEPTACLES. PROVIDE IN EXISTING LOCATIONS AND NEW LOCATIONS AS INDICATED.
9. PROVIDE WEATHER RESISTANT TYPE RECEPTACLES WITH WEATHER PROOF WHILE-IN-USE COVERS WHERE RECEPTACLES ARE LOCATED OUTDOORS OR IN WET LOCATIONS.
10. PROVIDE GFCI PROTECTED RECEPTACLES IN THE BATHROOMS, KITCHENS, OUTDOORS, AND WHERE LOCATED IN WET AND DAMP LOCATIONS. WHERE GFCI TYPE RECEPTACLES ARE LOCATED WHERE THEY ARE NOT READILY ACCESSIBLE, RECEPTACLES SHALL BE CONNECTED TO GFCI TYPE CIRCUIT BREAKERS.
11. EXISTING TELECOMMUNICATION AND TV OUTLETS ARE TO REMAIN WHERE SHOWN. DISCONNECT AND COIL UP EXISTING CABLING FOR FUTURE CONNECTION AND USE.
12. EXISTING SMOKE AND CARBON MONOXIDE ALARMS ARE TO BE REMOVED AND REPLACED WITH NEW SMOKE AND CARBON MONOXIDE ALARMS. ALARMS SHALL BE 120 VOLT HARDWIRED WITH BATTERY BACKUP AND INTERCONNECTED SO THAT DETECTION OF ANY ONE ALARM IN A UNIT WILL SOUND ALL ALARMS IN THAT PARTICULAR DWELLING UNIT.
13. ALL EXISTING LIGHT FIXTURES ARE TO BE REMOVED AND TO BE REPLACED WITH NEW LIGHTS AS SHOWN AND INDICATED IN THE FIXTURE SCHEDULE.
14. REUSE EXISTING WIRING AS APPROPRIATE. PROVIDE NEW WIRING AS NECESSARY. WIRING IS TO BE APPROPRIATE FOR THE USE, LOCATION, AND COMPLY WITH THE NEC AND OTHER GOVERNING CODES.
15. PROVIDE NEW WIRING FOR 50 AMP 120/240 VOLT KITCHEN RANGE.
16. REMOVE ALL ELECTRICAL IN LAUNDRY MODULES. LAUNDRY MODULES SHALL BE USED AS UNHEATED STORAGE ROOMS WITH NO ELECTRICAL.

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ELECTRICAL
2-BEDROOM DEMOLITION AND REMODEL PLANS
E101

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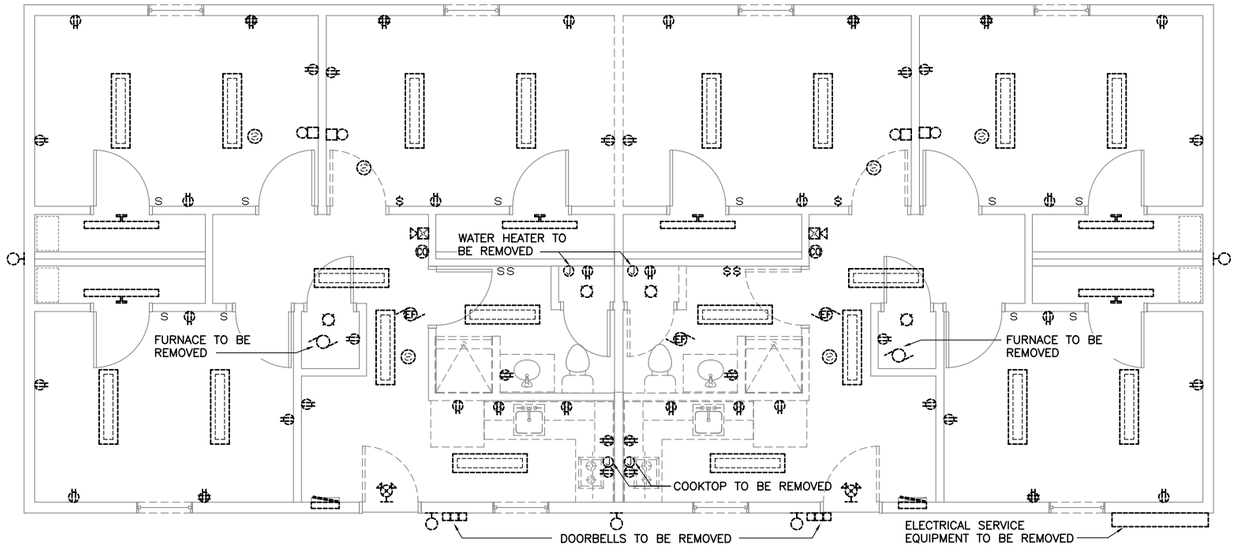
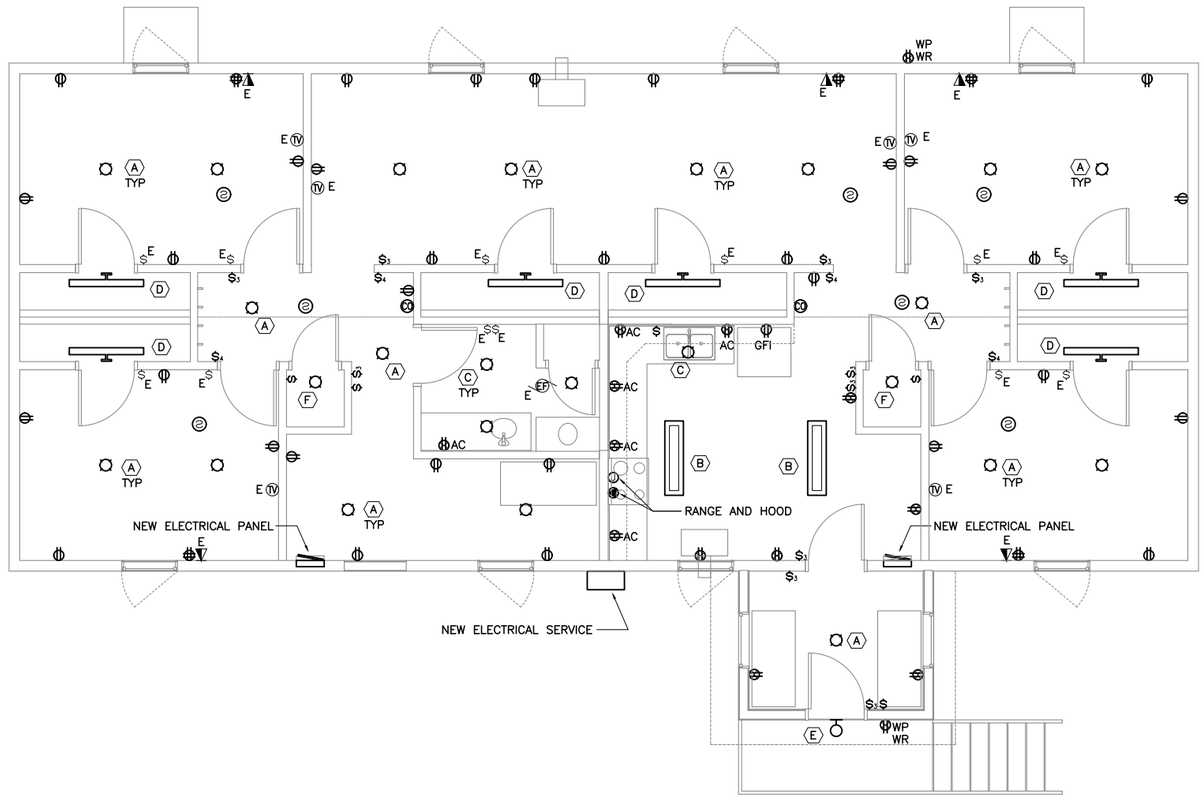


1 E201 LIGHTING, POWER, AND SIGNAL DEMOLITION PLAN - FOUR BEDROOM UNIT

SCALE: 1/4" = 1'-0"



2 E201 LIGHTING, POWER, AND SIGNAL REMODEL PLAN - FOUR BEDROOM UNIT

SCALE: 1/4" = 1'-0"

GENERAL NOTES

1. REMOVE EXISTING FIRE ALARM SYSTEM IN ITS ENTIRETY.
2. REMOVE ELECTRICAL ASSOCIATED WITH DEMOLITION OF MECHANICAL EQUIPMENT (FURNACES, WATER HEATERS, EXHAUST FANS, ETC). REFERENCE MECHANICAL DOCUMENTS.
3. REMOVE ELECTRICAL IN WALLS AND CEILINGS WHICH ARE TO BE REMOVED.
4. REMOVE EMERGENCY LIGHTS, EXIT SIGNS, AND ASSOCIATED ELECTRICAL.
5. REMOVE EXISTING ELECTRICAL DISCONNECTS, BOXES, CONDUITS AND CONDUCTORS ASSOCIATED WITH INCOMING POWER FEED ON THE EXTERIOR OF THE BUILDING. REPLACE NEW ELECTRICAL SERVICE EQUIPMENT, COMPATIBLE WITH THE SERVING UTILITY STANDARDS.
6. REPLACE EXISTING 120/208 VOLT, 3 PHASE PANELS WITH NEW 120/240 VOLT, SINGLE PHASE PANELS. RECONNECT TO EXISTING BRANCH CIRCUITRY. PROVIDE QUANTITY AND RATING OF CIRCUIT BREAKERS AS REQUIRED. ALL CIRCUIT BREAKERS ARE TO BE RATED FOR THE AVAILABLE FAULT CURRENT.
7. CIRCUIT BREAKERS ARE TO BE COMBINATION ARC FAULT TYPE WHERE REQUIRED BY THE NEC (210.12).
8. REMOVE AND REPLACE ALL EXISTING RECEPTACLES WITH NEW TAMPER RESISTANT TYPE RECEPTACLES. PROVIDE IN EXISTING LOCATIONS AND NEW LOCATIONS AS INDICATED.
9. PROVIDE WEATHER RESISTANT TYPE RECEPTACLES WITH WEATHER PROOF WHILE-IN-USE COVERS WHERE RECEPTACLES ARE LOCATED OUTDOORS OR IN WET LOCATIONS.
10. PROVIDE GFCI PROTECTED RECEPTACLES IN THE BATHROOMS, KITCHENS, OUTDOORS, AND WHERE LOCATED IN WET AND DAMP LOCATIONS. WHERE GFCI TYPE RECEPTACLES ARE LOCATED WHERE THEY ARE NOT READILY ACCESSIBLE, RECEPTACLES SHALL BE CONNECTED TO GFCI TYPE CIRCUIT BREAKERS.
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12. EXISTING SMOKE AND CARBON MONOXIDE ALARMS ARE TO BE REMOVED AND REPLACED WITH NEW SMOKE AND CARBON MONOXIDE ALARMS. ALARMS SHALL BE 120 VOLT HARDWIRED WITH BATTERY BACKUP AND INTERCONNECTED SO THAT DETECTION OF ANY ONE ALARM IN A UNIT WILL SOUND ALL ALARMS IN THAT PARTICULAR DWELLING UNIT.
13. ALL EXISTING LIGHT FIXTURES ARE TO BE REMOVED AND TO BE REPLACED WITH NEW LIGHTS AS SHOWN AND INDICATED IN THE FIXTURE SCHEDULE.
14. REUSE EXISTING WIRING AS APPROPRIATE. PROVIDE NEW WIRING AS NECESSARY. WIRING IS TO BE APPROPRIATE FOR THE USE, LOCATION, AND COMPLY WITH THE NEC AND OTHER GOVERNING CODES.
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ELECTRICAL
4-BEDROOM DEMOLITION AND REMODEL PLANS

E201