

# Imagine a Space for Healing

Kim Sweet, Lower Kuskokwim School District  
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Steven Paget, Sazan Group

April 22, 2023



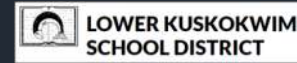
**LOWER KUSKOKWIM  
SCHOOL DISTRICT**



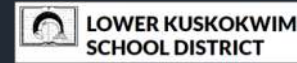
SÄZÄN  
GROUP

Lower Kuskokwim School District // [www.lksd.org/](http://www.lksd.org/) // BDS Architects // [www.bdsak.com](http://www.bdsak.com) // Sazan Group // [www.sazan.com](http://www.sazan.com)

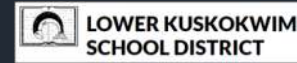
# Newtok, Alaska



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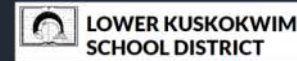
# Newtok Ayaprun K-12 School



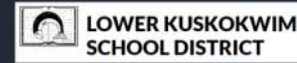
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## Trauma of Leaving Ancestral Home



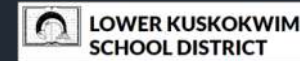
"For Newtok people, who have been there for time immemorial, they are being forced to leave the land they have known for generations and move to land they have not established the same connection with."

- Warren Nicolai, LKSD Project Manager





## Trauma of Leaving Ancestral Home

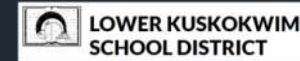


“With climate change, people are being involuntarily displaced from the place called home (for as long as anyone can remember). The effects are devastating to an entire culture.”

- David Sparck, LKSD Bethel Facilities Manager



## Brief History of Newtok Relocation to Mertarvik



- 1983: Erosion was Documented from Historical Aerial Photos
- 1994: Newtok Traditional Council Identified 6 possible New Town Sites.
- 2000: Arctic Slope Consulting Group (ASC prepared reports for early planning efforts for relocation.
- 2006: Mertarvik Development Begins
- 2008: First Homes Completed in Mertarvik
- 2019: Mertarvik Evacuation Center Completed



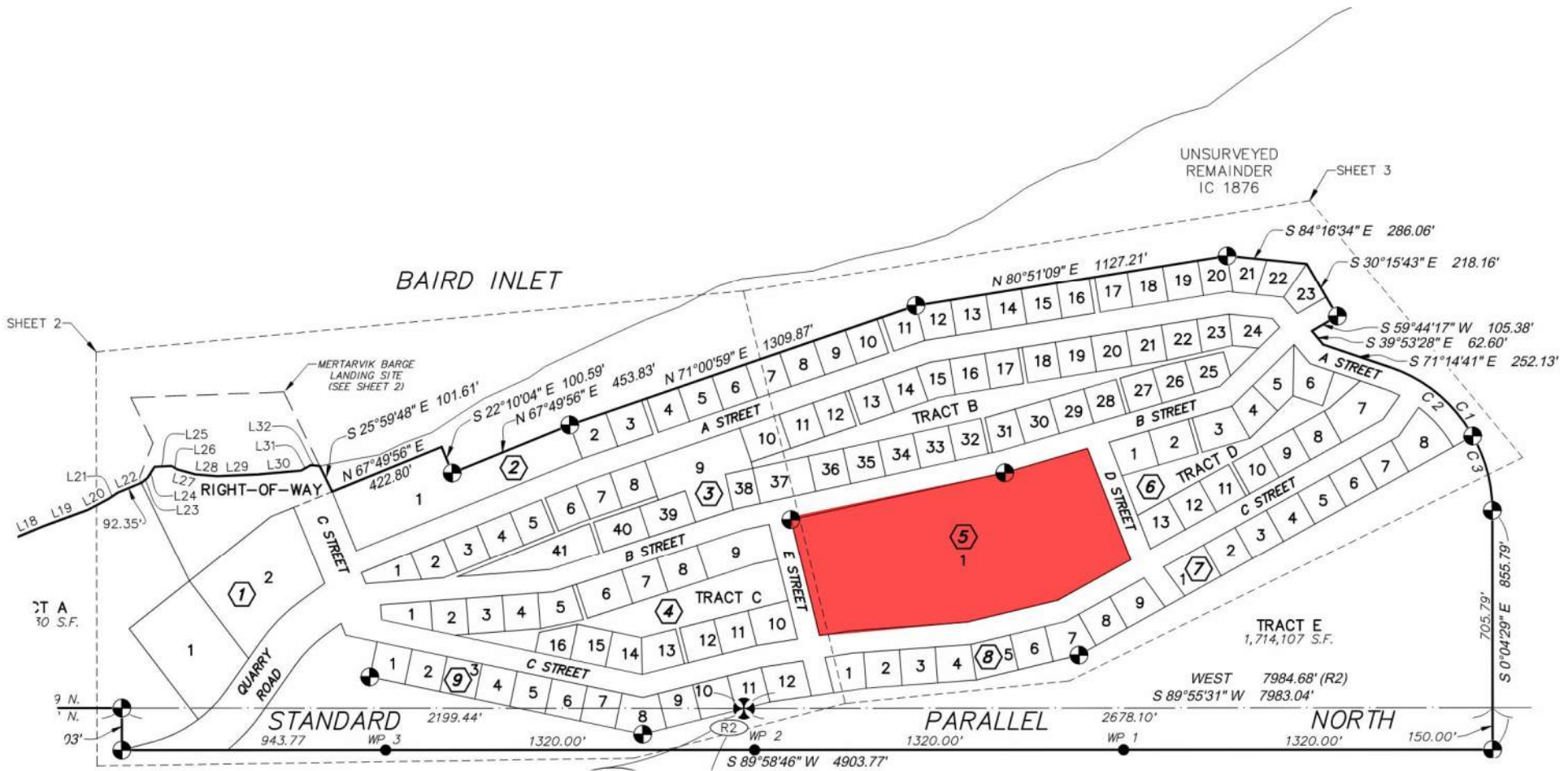
# Mertarvik, Alaska



# Mertarvik, Alaska



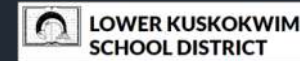
# Mertarvik, Alaska



## Importance of School Building in Rural Alaskan Villages



## State of Alaska Educational Grant Funding Process



- State of Alaska Department of Education and Early Development (DEED) Provides Formulated Average Daily Membership (ADM) For Each School based on Population.



## Independent Value Analysis

### Projected Student Population

- Average Daily Membership (**ADM**) determines Allowable Gross Square Footage (**GSF**)

Allowable Gross Square Footage

X \$ per Square Foot

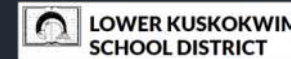
X % State Match

= \$ **State Match funded**





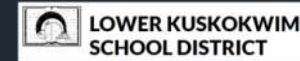
## State of Alaska Educational Grant Funding Process



- State of Alaska Department of Education and Early Development (DEED) Provides Formulated Average Daily Membership (ADM) For Each School based on Population.
- Districts hire A/E Teams to Complete Condition Surveys, Concept, and/or Schematic Design Reports
- Districts Submit State Grant Application
- State of Alaska Objectively Ranks Grant Applications Annually
- If Funds are Available, Highest Ranked Project(s) is Funded.



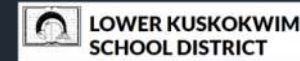
## Brief History BDS Architects Involvement



- Summer 2021: BDS Architect completes Schematic Design Report for DEED Grant Application
- Fall 2021: Grant Application submitted and project was Ranked #1.
- 2022: LKSD hired BDS Architects to start design prior to receiving grant funding from the State of Alaska due to state of the riverbank.
- Designed Square footage was under sized 3,168 SF from ADM Data Available.
- Phase 1 Awarded, Phase 2 Design Complete Early 2024



## Project Challenges



- Dispersed Newtok Population
- Keeping Newtok School Operational and Safe
- Lack of Housing in Mertarvik
- \$16 Million Gap in Project Funding and 3,168 SF



## Independent Value Analysis

**Objective of the Mertarvik Independent Value Analysis (IVA):**

**Reach a Consensus Recommendation  
on  
Project Scope, Delivery Approach, and Budget**

Preparatory to DEED including the project in the FY2024 Capital Improvement Projects list  
submitted to the Governor and Legislature

## Independent Value Analysis Process

# INNOVATION

### So, what is Value Analysis?

- Systematic process to **IMPROVE** the **VALUE** of a project
- **VALUE** is needs or **FUNCTIONS** delivered relative to cost  
**VALUE = FUNCTIONS/COST**
- **FUNCTIONS** often measured by **PERFORMANCE**
  - Quality, Quantity or Size, Aesthetics, Durability, Maintainability, Sustainability, or other factors
- Value Analysis employs **Creative** and **Analytical Techniques** to identify **ALTERNATIVE** means to deliver required functions while improving performance and reducing cost

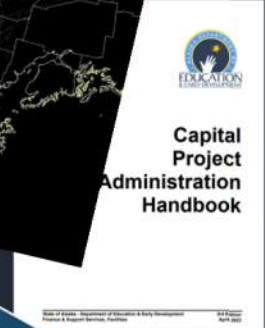
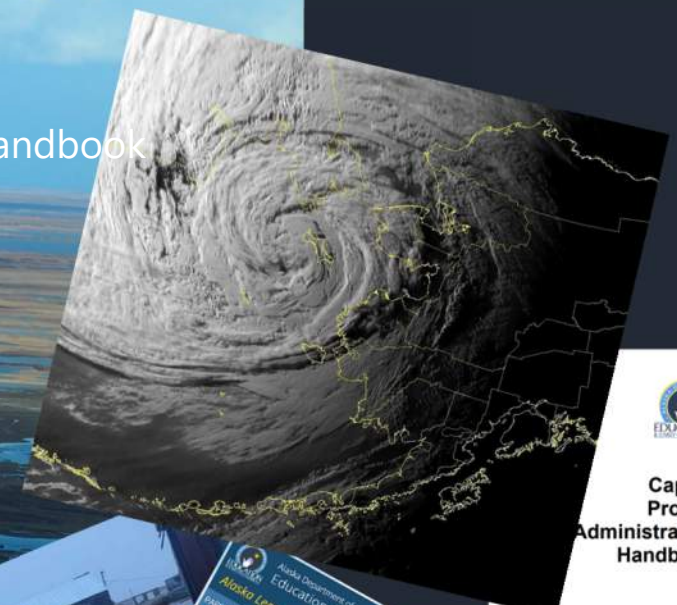


Workshop setting by a collaborative interdisciplinary team led by a qualified Value Analysis facilitator

# Independent Value Analysis

## Context of the Mertarvik Independent Value Analysis (IVA):

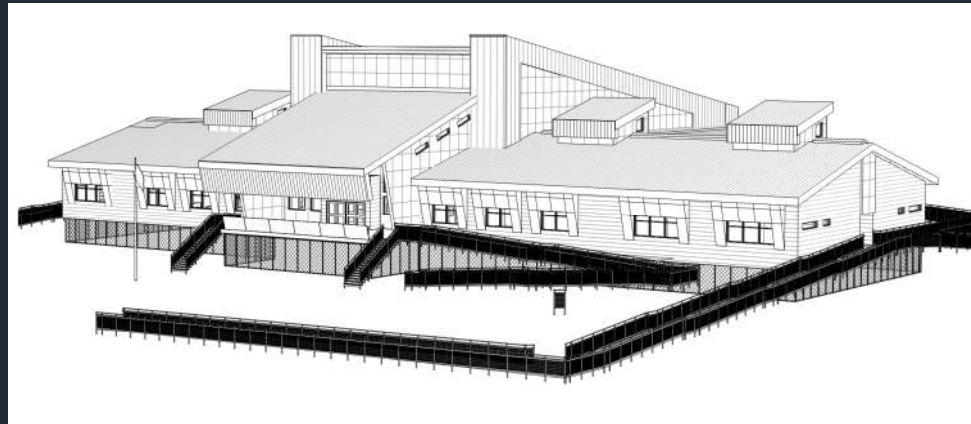
- Level 3 IVA in accordance with DEED Capital Project Administration Handbook
- Meetings between LKSD, BDS and Sazän to scope study objectives
- Site visit by Sazän and HMS, accompanied by LKSD and BDS
- 3-day virtual workshop with a mixed team:
  - Lower Kuskokwim School District
  - Sazän
  - BDS Architects
  - DEED
  - VA team Subject Matter Experts – HMS, Design 2Last, Coffman Engineers, and CCHRC/NREL



## Independent Value Analysis

### IVA Study Focus:

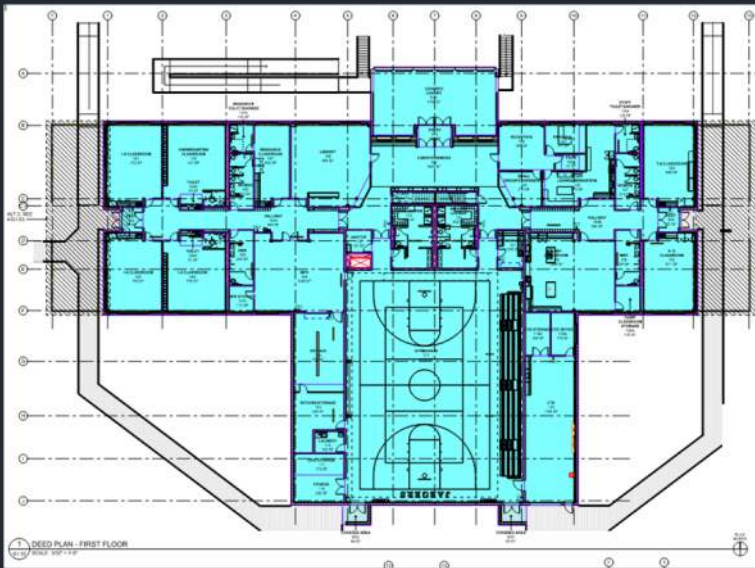
- Validate the design program GSF area
- Identify strategies to improve value of the new facility design
- Identify an alternative methodology for projecting student population which accounts for displaced students
- Facilitate decommissioning and demolition of the existing school facilities at Newtok
- Reduce the gap between the DEED Capital Improvement Plan (CIP) budget and LKSD estimated cost



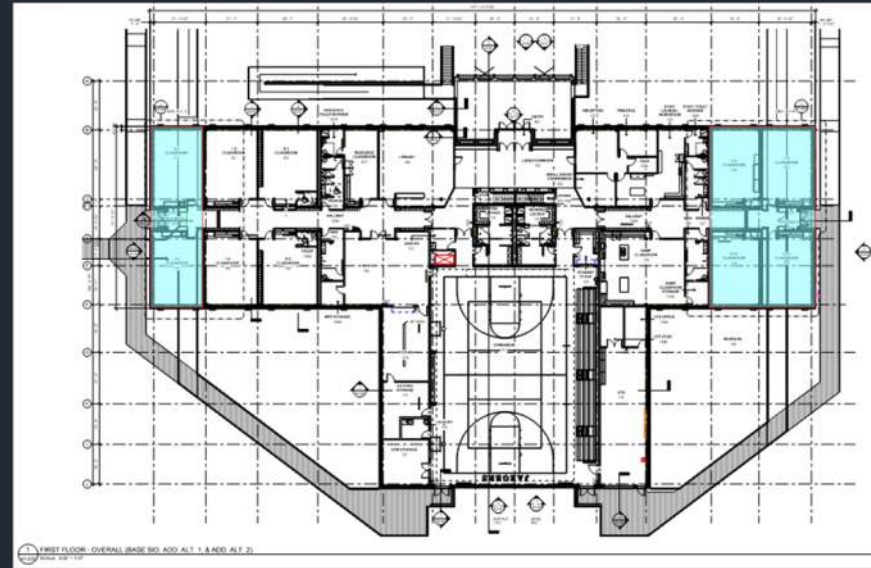
# Independent Value Analysis

## Gross Square Foot Analysis

**Allowable GSF 10% below  
Program GSF**



Floorplate based on DEED Allowable GSF



Floorplate based on Base Bid + Alts 1 & 2



## Innovation: Accounting for a Population during a Climate-Change Induced Diaspora

### IVA Challenges

- Unprecedented dispersion and relocation of a people
- Decline driven by climate-change impacts and lack of new housing in Mertarvik
- Standard linear population projection did not account for dispersed families unable to relocate to Mertarvik



Newtok Ayaprun School and Community on October 17, 2020 at Low Tide

## Innovation: Accounting for a Population during a Climate-Change Induced Diaspora

### Establishing an Alternative Methodology for Forecasting Student Population

- DEED agreed to accept a proposed alternative methodology that was more predictive, would equitably account for the broader school population, and be defensible
- Qualitative Assessment
  - Family surveys
- Quantitative Assessment
  - Houses in Village
  - Average Child per House
  - Projected Housing Starts
    - the new factor



## Innovation: Accounting for a Population during a Climate-Change Induced Diaspora

### Qualitative Assessment

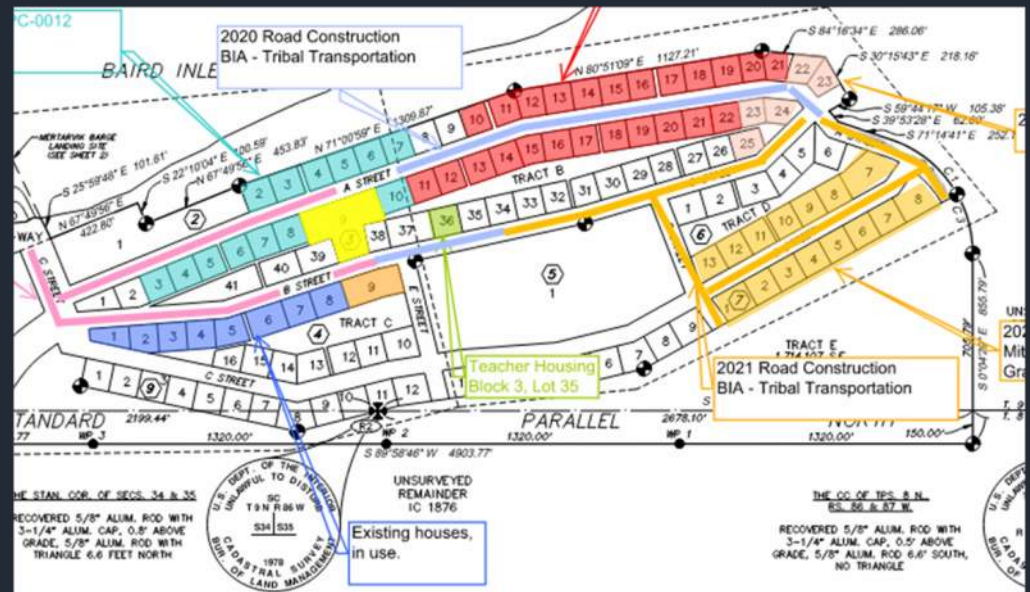
- Family surveys
  - Interviews with dispersed families who would move to Mertarvik when housing is available
  - Identified 61 displaced students whose families plan on returning
  - Lack of housing emerged as limiting factor



# Innovation: Accounting for a Population during a Climate-Change Induced Diaspora

## Quantitative Assessment

- Houses in Village
  - Mertarvik housing development 2018 - 2022
    - 26 currently occupied houses
    - 6 single family houses under construction
    - 2 four-plexes under construction



# Innovation: Accounting for a Population during a Climate-Change Induced Diaspora

## Quantitative Assessment

- Average Child Per House
  - Assessment of 3 representative tundra villages
  - Using the data you have:
    - ✓ Impact Aid grant data
    - ✓ Annual OASIS student count
    - ✓ Mapping houses occupied by students
  - Average of 1.55 students/household
  - Comparison to Newtok/Mertarvik
    - Measuring displaced students

Table 5: Average Student per House in the Tundra Villages			
Village	Impact Aide Average Occupancy	Percentage of Impact Aide Houses	Average Student per House
Atmautluak	2.17	58%	1.26
Kasigluk-Akiuk	2.90	72%	2.09
Kasigluk-Akula	2.39	52%	1.24
Nunapitchuk	2.88	56%	1.61
		<b>Tundra Village Average</b>	1.55

Measuring Displaced Students Over the Past 3 Years				
	FY23	FY22	FY21	FY20
Combined Count Newtok/Mertarvik	88	94.8	107.25	107.65
Change over time	5.8	12.45	0.4	0
			<b>Total</b>	18.65

# Innovation: Accounting for a Population during a Climate-Change Induced Diaspora

## Quantitative Assessment

- Projected Housing Starts – the missing factor in the traditional population forecast
  - Projections from multiple sources
  - Variances in the historic data
  - Used more conservative average of 6.8/year

**Table 7: Historic Housing Builds:**

Year	Number of homes built Per NREL	Per PLM
2018	4	8
2019	13	13
2020	9	4
COVID 2021	2	5
2022	6	6
<b>Average</b>	<b>6.8</b>	<b>7.2</b>



**BUILDING 13 NEW CCHRC HOUSES**



# Innovation: Accounting for a Population during a Climate-Change Induced Diaspora

## Quantitative Assessment

- Forecasting Student Counts based on Projected Housing Starts
- 3 models developed
  - Pace #1 linear model of historic housing builds
  - Pace #2 incorporating a FEMA event
  - Pace #3 conservative builder projection of builds
- Results of 3 models averaged
  - **Forecast of 134 students**

**43% Difference Between District and DEED Forecasts**

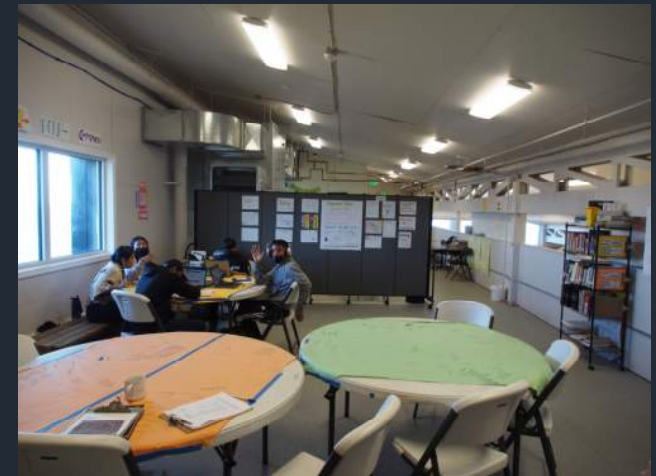


Table 11: Total Predicted Student Count:			
	Current Mertarvik Student Count	Predicted Count for FY30	Total Student Population
Pace #1	43	84.32	127.32
Pace #2	43	112.22	155.22
Pace #3	43	79.05	122.05
		<b>Average</b>	<b>134.86</b>

## Innovation: Accounting for a Population during a Climate-Change Induced Diaspora

### Quantitative Assessment

- Calculating GSF
- DEED provides Allowable Space Calculation Workbook
  - Ratio of GSF to ADM is not disclosed
  - Table provides stepped GSF for range of ADMs
- Calculation of GSF based on Newtok/Mertarvik Total ADM



**Table 14: At current Elementary to Secondary student ratio (43.05:51.75)**

GSF	Total ADM	Elem	Sec
24000	84.43	38.34	46.09
26000	93.43	42.43	51
28000	102.83	46.7	56.13
30000	112.64	51.15	61.49
32000	122.89	55.81	67.08
<b>34000</b>	<b>133.59</b>	<b>60.67</b>	<b>72.92</b>



# Independent Value Analysis Results

## Alternative Methodology for Forecasting Student Population

- IVA Objective: Validate allowable GSF for the Mertarvik K-12 New School facilities
- DEED accepted alternative methodology as defensible
- Discounted District ADM results 10%

**13% increase over original  
Allowable GSF**



Combined Newtok-Mertarvik Schools / Attendance Areas				
Target GSF and required projected ADM for 2030-2031 school year (5-year post occupancy)				
At current Elementary to Secondary student ratio (43.05:51.75)				
Desired GSF	Total ADM	Elem	Sec	
24000	84.43	38.34	46.09	
26000	93.43	42.43	51.00	
28000	102.83	46.70	56.13	
29111	108.22	49.14	59.08	
29911	112.19	50.95	61.24	
30000	112.64	51.15	61.49	
31710	121.37	55.12	66.25	90% of VA forecast of 134.85
32000	122.89	55.81	67.08	
32043	123.11	55.91	67.20	
34000	133.59	60.67	72.92	

## Independent Value Analysis Results

### Approved Budget

- DEED adjusted GSF Budget

**19% Increase over Original Budget**

- Results:
  - 4 Additional Classrooms
  - Increase to All Classroom Square Footage



# Mertarvik K-12 School

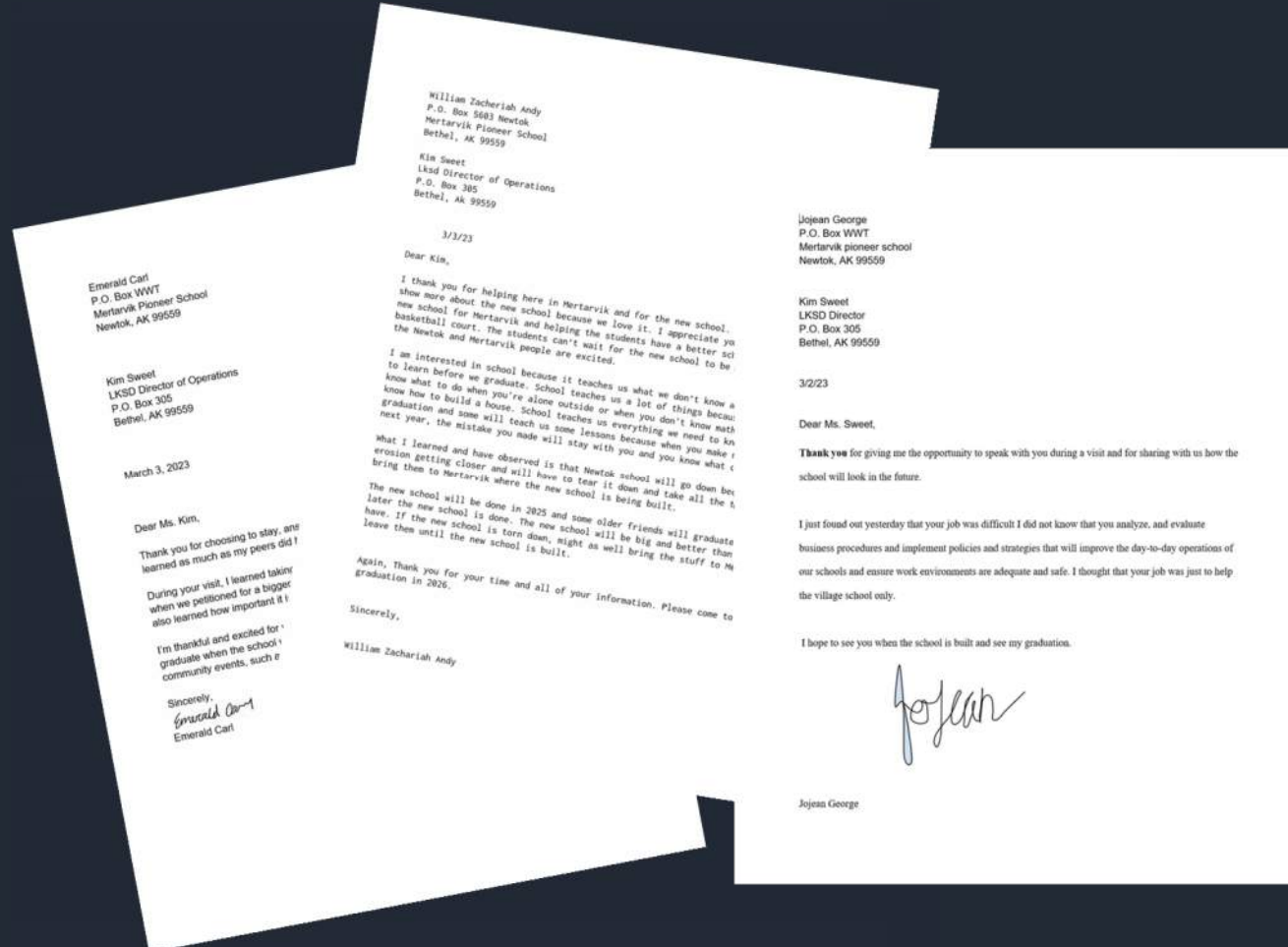




# Healing of A Community: Community Advocates



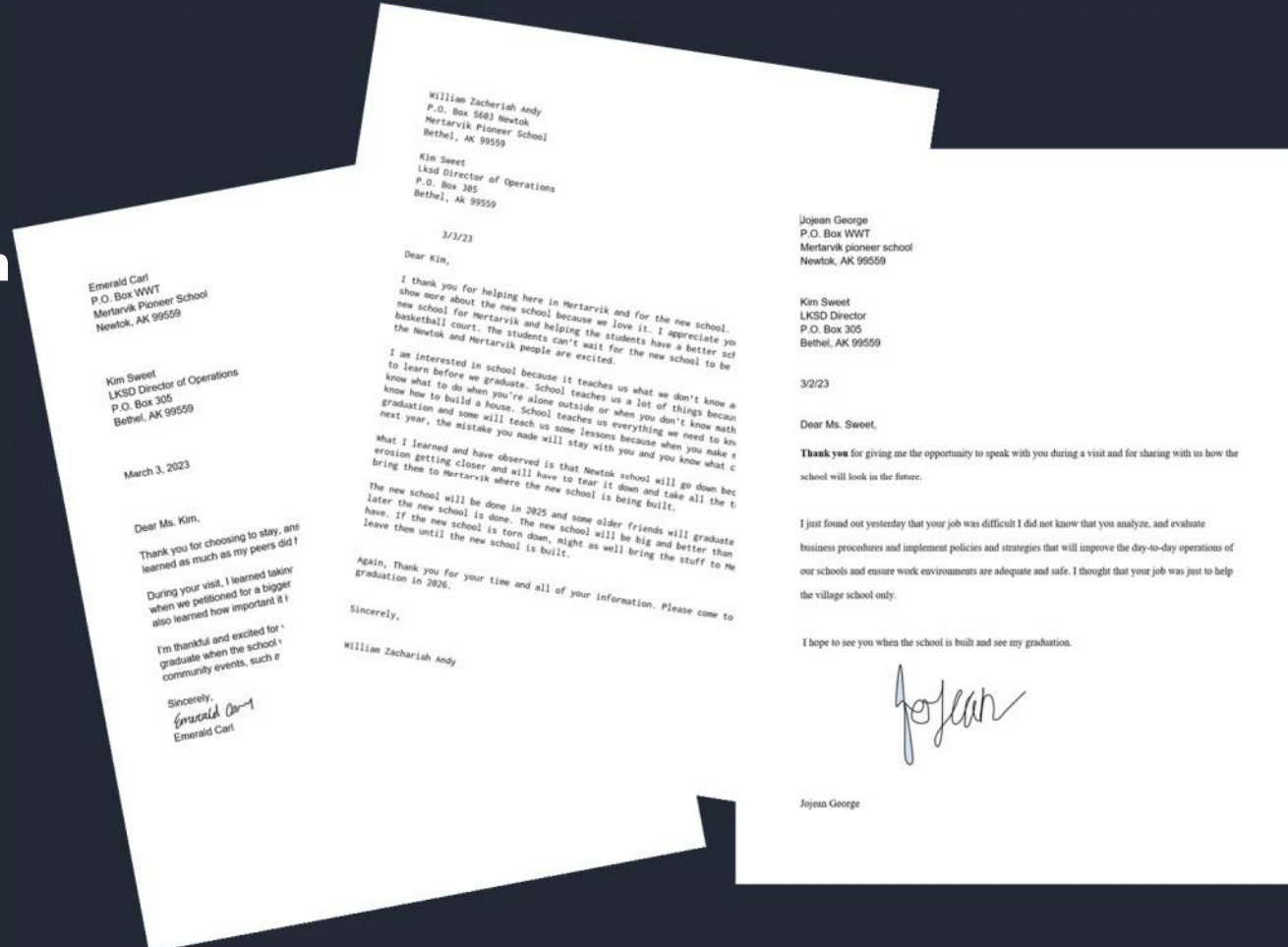
“During your visit, I learned taking action or speaking up makes an impact on decisions...I also learned how important it is to advocate for our community.”



# Healing of A Community: Community Advocates



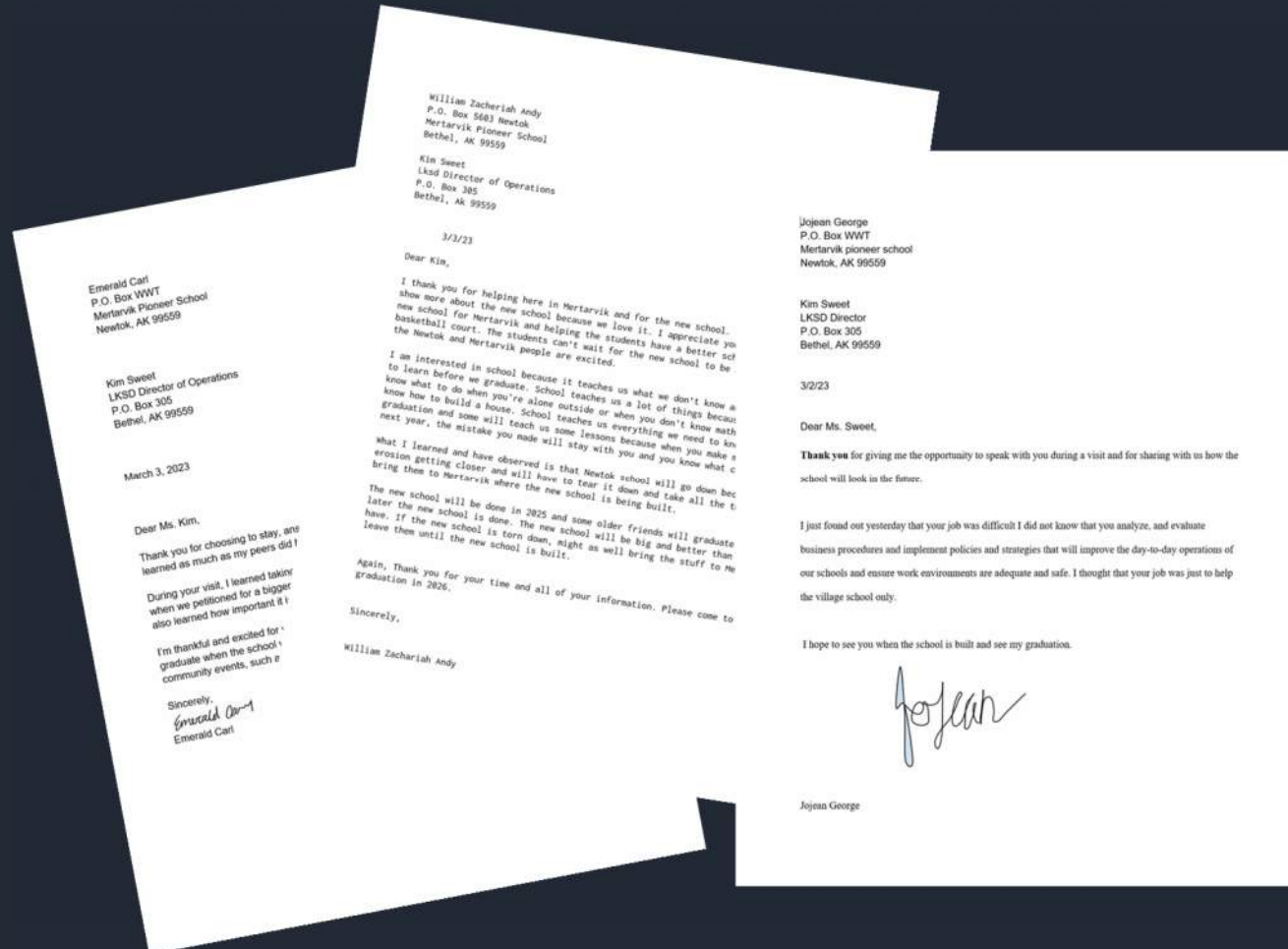
“I would like to be a coach in the new school so that I could be a part of education in our community.”



# Healing of A Community: Community Advocates



“Our school that’s going to be demolished this year has a lot of memories from when I was a kid, including when I was in kindergarten. It will be sad to see it go, but we also look forward to the future.”



## Planning For Climate Change



- Incorporate into your Thinking, Planning and Design, the Question: how will our project be responsive to a changing climate?
- Location, Location, Location: Know Your Area's Potential Natural Disasters
- Allow for Additional or Different Infrastructure, Envelope, and Services
- Think Out of the BOX for the Unexpected and Possible Solutions
- Advocate For Your Community
- Know Your Resources





## Closing Thoughts



LOWER KUSKOKWIM  
SCHOOL DISTRICT



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- Know Where Your Data Is
- Diaspora Report Availability
- Research what State and/or Federal Climate Change Adaptation and Hazard Mitigation Plans have been prepared for your Region by FEMA, NREL, DOE, EPA, others and potential implications for your project
- [Newtok, The Water is Rising](#) Patagonia Documentary Free on YouTube
- [Newtok/Mertarvik Relocation](#)
- [NEWTOK PLANNING GROUP](#)



# Thank you!

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Steven Paget, [spaget@sazan.com](mailto:spaget@sazan.com)

[Patagonia: "Newtok, The Water is Rising": Free on YouTube](#)



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