

*PROGRAM DEMAND COST MODEL  
FOR  
ALASKAN SCHOOLS*

Introduction, Instructions and Tables



12th Edition  
(April 2010)



## **FORWARD**

The cost estimate for the Program Demand Cost Model for Alaskan schools was originally developed for the State of Alaska, Department of Education in 1981; and has been used over the years with considerable success. It has been updated from time to time through this being the 12th Edition.

This 12th Edition Program Demand Cost Model has been developed by HMS Inc., 4103 Minnesota Drive, Anchorage, Alaska 99503, is a complete demand cost model for both new construction (or major additions) and renovation.

The intent of the Program Demand Cost Model is to establish a complete budget for each facility, useful for legislative requests or bond issues, or other forms of appropriation to be placed before the electorate. Also, it can be used merely as a feasibility analysis without going to the expense of producing architectural drawings or engineering reports, but simply with the developed educational specifications and this Program Demand Cost Model. The secondary use for the cost estimate Program Demand Cost Model is to establish the present replacement value for insurance purposes.

Prices and unit rates are based on early 2010 costs for materials, equipment and freight, and labor rates. It should be noted that this is a method to develop a budget only and actual costs will vary. The Program Demand Cost Model will not be applicable for specific projects with developed design beyond concept level.

Escalation is factored in. Refer to HMS Inc.'s Alaskan Construction Escalation Index, Table No. 3, of this report.

Program Demand Cost Models: 1st Edition - May 1981; 2nd Edition - November 1983 (computerized in December 1984); 3rd Edition - August 1986; 4th Edition - August 1988; 5th Edition - June 1991; 6th Edition - July 1997; 7th Edition - November 1997, 8th Edition (7th Revised) - March 2000; 9th Edition - April 2001; 10th Edition - March 2005; 11th Edition - April 2007, 11th Edition Update - March 2008, and 11th Edition Revised - April 2009.



## **INSTRUCTIONS ON HOW TO USE THE DEMAND COST MODEL**

The Demand Cost Model is created in Microsoft Excel 2003.

To start, open the template and save a copy on your hard drive.

Starting with the Project Summary sheet, fill in the necessary information in the **RED** cells only (school district, project, location and date) and all other sheets will format accordingly. For a renovation project, the square foot quantity must be placed in appropriate cell, the new construction square foot quantity is calculated using the quantities placed within the model.

Next, go to Tab 1.0 for New Construction, or Tab 11.00 for Renovation Work. Place quantities in applicable **RED** cells. Please note, the red cells are the only cell that can be edited. HINT: If you use the tab key, you will move from cell-to-cell on those requiring input.

Proceed through the other tabbed sheets. All subtotal calculations and summary sheets will be calculated automatically.

After completing the variable information make sure to save your work. You can print the entire workbook by selecting File, Print, Entire Workbook.



## **BIBLIOGRAPHY**

Guide for School Facility Appraisal - Alaska Edition (Adapted for the State Alaska - Department of Education): The Council of Education Facility Planners, International - May 1994.

Cost Estimate Program Demand Model - State of Alaska, Department of Education.

HMS Inc. 1st Edition - May 1981; 2nd Edition - November 1983 (computerized in December 1984); 3rd Edition - August 1986; 4th Edition - August 1988; 5th Edition - June 1991; 6th Edition - July 1997; 7th Edition - November 1997, 8th Edition (7th Revised) - March 2000; 9th Edition - April 2001; 10th Edition - March 2005; 11th Edition - April 2007, 11th Edition Update - March 2008; and 11th Edition Revised - April 2009.

Cost Data Files and Records. HMS Inc., 1980 through early 2010.

Title 36, Public Contracts: Laborers' and Mechanics' Minimum Rates of Pay, State of Alaska, Department of Labor, dated April 2009.

Department of Education, Appendix F: Type of Space Added or Improved by the Bond Reimbursement & Grant Review Committee, April 18, 1997.

Site Adjustment Factor

Based on a formula developed for the Department of Defense USA federal government projects.



## TABLES

- No. 1 - Geographic Area Cost Factor
- No. 2 - Size Adjustment Factor
- No. 3 - Alaskan Construction Escalation Index
- No. 4 - DOE Instruction CIP Application, Appendix F
- No. 5 - Abbreviations
- No. 6 - Statement of Specifications



**TABLE NO. 1**  
**GEOGRAPHIC AREA COST FACTOR**  
**APRIL 2010**

	INDEX	PERCENTAGE
Alaska Gateway	125.20	25.20%
Aleutian Region	154.50	54.50%
Aleutians East	128.70	28.70%
Anchorage (Base)	100.00	0.00%
Annette Island	124.40	24.40%
Bering Strait	181.20	81.20%
Bristol Bay Borough Schools	128.70	28.70%
Chatham	124.40	24.40%
Chugach	108.50	8.50%
Copper River	113.90	13.90%
Cordova	108.50	8.50%
Craig City Schools	112.40	12.40%
Delta/Greely	119.63	19.63%
Denali Borough	119.63	19.63%
Dillingham City Schools	133.54	33.54%
Fairbanks	105.00	5.00%
Galena	139.30	39.30%
Haines	112.40	12.40%
Hoonah City Schools	124.40	24.40%
Hydaburg City Schools	124.40	24.40%



**TABLE NO. 1**  
**GEOGRAPHIC AREA COST FACTOR**  
**APRIL 2010**

	INDEX	PERCENTAGE
Iditarod Area Schools		
Yukon River Village	143.05	43.05%
Kuskokwim River Village	154.50	54.50%
Landlocked Village	160.90	60.90%
Juneau City/Borough Schools	103.60	3.60%
Kake City Schools	122.90	22.90%
Kashunamuit	152.36	52.36%
Kenai Peninsula		
Kenai/Soldotna	98.60	-1.40%
Homer Area	105.50	5.50%
Ketchikan	110.80	10.80%
Klawock City Schools	124.40	24.40%
Kodiak Island		
Kodiak	112.40	12.40%
Village	124.40	24.40%
Kuspuk Schools	154.00	54.00%
Lake & Peninsula		
Gulf of Alaska Village	124.40	24.40%
Bristol Bay Village	136.04	36.04%
Landlocked Village	160.73	60.73%
Lower Kuskokwim		
Bethel	156.10	56.10%
Villages	167.10	67.10%
Lower Yukon	167.10	67.10%
Mat-Su Borough Schools		
Palmer - Wasilla	99.00	-1.00%
Other Areas	105.50	5.50%
Nenana City Schools	116.50	16.50%



**TABLE NO. 1**  
**GEOGRAPHIC AREA COST FACTOR**  
**APRIL 2010**

	INDEX	PERCENTAGE
Nome City Schools	156.10	56.10%
North Slope Borough		
Barrow	171.80	71.80%
Villages	182.20	82.20%
Atqasuk/Pt. Lay	199.90	99.90%
Northwest Arctic Schools		
Kotzebue	150.18	50.18%
Villages	181.50	81.50%
Pelican City Schools	124.40	24.40%
Petersburg City Schools	110.80	10.80%
Pribilof Island Schools	164.70	64.70%
Sitka City Borough	110.80	10.80%
Skagway City Schools	110.80	10.80%
Southeast Island Schools	123.19	23.19%
Southwest Region Schools	140.91	40.91%
St. Mary's School District	159.75	59.75%
Tanana City Schools	134.65	34.65%
Unalaska City Schools	140.00	40.00%
Valdez City Schools	109.30	9.30%
Wrangell City Schools	110.80	10.80%
Yakutat City Schools	115.40	15.40%
Yukon Flats		
Village on Road System	122.95	22.95%
Village on River	141.80	41.80%
Landlocked Village	159.73	59.73%



**TABLE NO. 1**  
**GEOGRAPHIC AREA COST FACTOR**  
**APRIL 2010**

	INDEX	PERCENTAGE
Yukon-Koyukuk		
Village on Road System	122.95	22.95%
Village on Yukon River	141.80	41.80%
Village on Koyukuk River	154.50	54.50%
Yupiit Schools	152.36	52.36%

**NOTES:**

This is an estimate of geographic area cost factors based on averages for materials, freight, equipment costs, and current Title 36 labor rates. The cost factors are based on an institutional building in Alaska using a standard AIA contract or similar contract. This is merely a guide, actual costs will vary.

This is only a guide and not necessarily correct for any specific need. It represents only a collection of costs normally found on some construction projects, rather than the custom requirements of a particular project.

This is not an index. This is a geographic area cost factor which includes not merely cost changes and logistical consideration, but also design criteria and how it is applied in different locations. Such design considerations would normally include standard concrete footings used mostly in Southcentral and Southeastern Alaska, to piling requirements in arctic and sub-Arctic, however, as this is a line item in the cost model, it has **not** been included in these calculations.

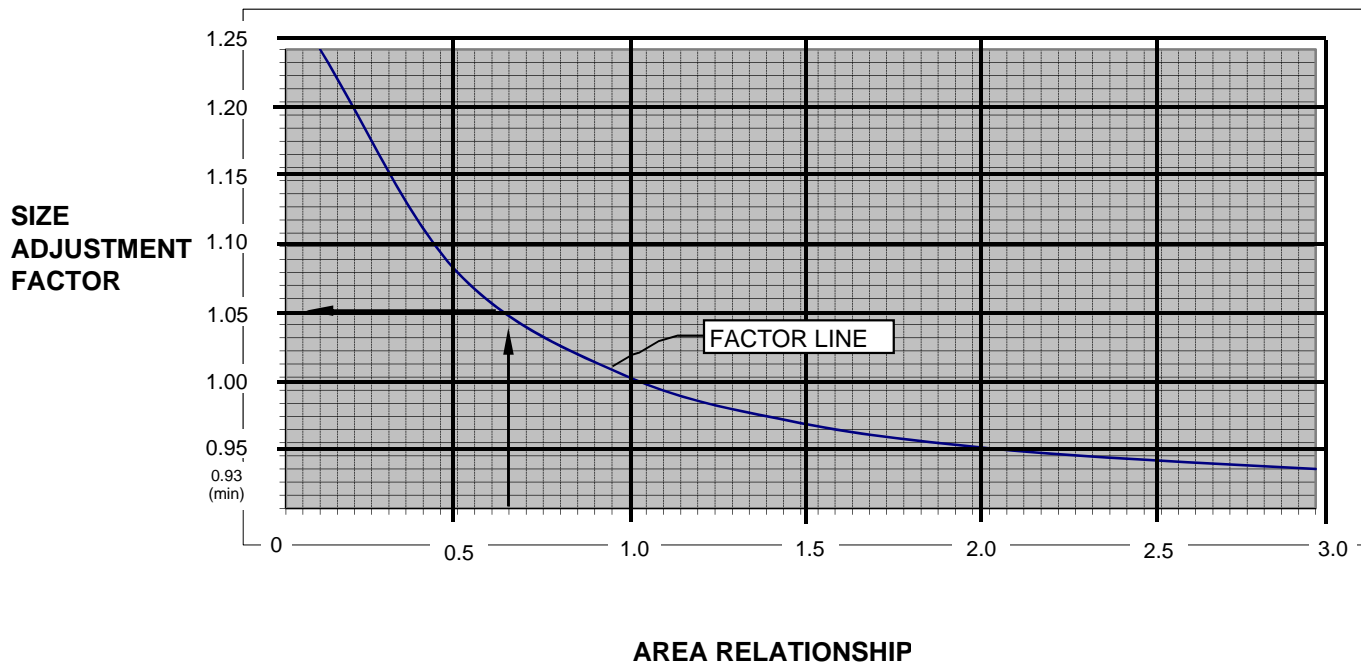
The calculation used in developing these cost factors are based on reasonable assumptions. For example, barge freight is mostly included rather than air freight for all materials and equipment. It is also assumed that local labor can be used to the fullest general availability, rather than all imported workers.

Village-to-village costs will vary plus or minus 5%. When using this geographic cost factor, consider how the location for which the estimate is being prepared is different from other surrounding places.

Regional cost factors are based on general and approximate calculations for anticipated conditions generally found in the area and logistic considerations. The more specific area factors are more subjective and based on opinion rather than any detailed analysis.



**TABLE NO. 2a**  
**SIZE ADJUSTMENT FACTOR**



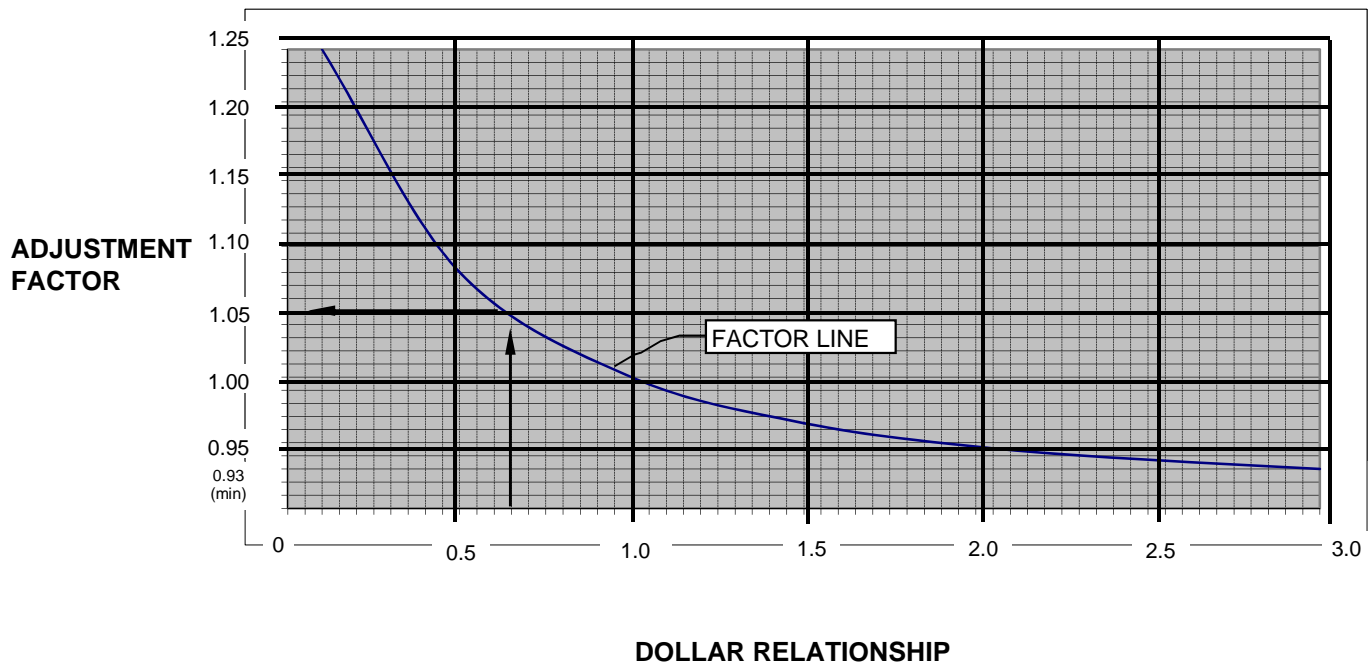
EXAMPLE: The Size Adjustment Factor is desired for a 16,000 SF Academic Facility.

AREA RELATIONSHIP: 
$$\frac{\text{PROPOSED FACILITY SIZE}}{\text{TYPICAL FACILITY SIZE}} = \frac{16,000 \text{ SF}}{25,000 \text{ SF}} = 0.64$$

Find .64 on the horizontal axis. Trace a vertical line to the factor curve and then trace a horizontal line to the vertical axis' Size Adjustment Factor which is 1.05.



**TABLE NO. 2b**  
**DOLLAR ADJUSTMENT FACTOR**



EXAMPLE: The Dollar Adjustment Factor is desired for a \$2,500,000 renovation project.

$$\text{DOLLAR RELATIONSHIP: } \frac{\text{PROPOSED FACILITY } \$2,500,000}{\text{TYPICAL FACILITY } \$4,000,000} = 0.625$$

Find .625 on the horizontal axis. Trace a vertical line to the factor curve and then trace a horizontal line to the vertical axis' Adjustment Factor which is 1.05.



**TABLE NO. 3**  
**ALASKAN CONSTRUCTION ESCALATION INDEX**  
**ANCHORAGE, ALASKA**

**APRIL 2010**

Base Year 1980	Index	Base Year 1980	Index	Percentage
1980	100.00	1997	146.70	
1981	104.40	1998	149.12	2.42%
1982	107.70	1999	150.96	1.84%
1983	115.60	2000	152.60	1.64%
1984	118.60	2001	154.53	1.93%
1985	117.70	2002	162.54	8.01%
1986	121.40	2003	166.34	3.80%
1987	123.00	2004	175.57	10.23%
1988	124.80	2005	187.55	11.98%
1989	126.40	2006	197.41	9.86%
1990	131.80	2007	204.73	7.32%
1991	134.30	2008	207.59	2.86%
1992	138.80	2009	209.27	1.68%
1993	143.30	2010	212.09	2.82%
1994	144.40	2011	(Guess)	3.25%
1995	143.40	2012	(Guess)	3.75%
1996	146.20			

**NOTES:**

Back-up data for this analysis is held at HMS Inc., 4103 Minnesota Drive, Anchorage, Alaska.

These cost estimates are an index based on average costs for materials, freight and equipment, also current Title 36 labor rates. The index is based on an institutional building in Anchorage using a standard AIA contract or similar contract.

Remember always that an index is only a useful guide and not necessarily correct for any specific need. It represents only a collection of costs normally found on some construction projects, rather than the custom requirements of a particular project.

Predictions for escalation, we do not envision major changes in the near future as it appears that the economy is somewhat static. For this reason, we are estimating escalation at a moderate level over the next two years.

From all the information gathered for this study of costs, we suggest a 3.25% escalation allowance to 2011, and for 2012 a suggestion of 3.75%.



**TABLE NO. 4**

**DEPT. OF EDUCATION INSTRUCTION CIP APPLICATION**

**APPENDIX F: TYPE OF SPACE ADDED OR IMPROVED  
ADOPTED BY THE BOND REINFORCEMENT & GRANT REVIEW COMMITTEE**

Category A - Instructional or Resource

Kindergarten  
 Elementary  
 General Use Classrooms  
 Secondary  
 Library/Media Center  
 Special Education  
 Bi-Cultural/Bilingual  
 Art  
 Science  
 Music/Drama  
 Journalism  
 Computer Lab/Technology Resource  
 Business Education  
 Home Economics  
 Gifted/Talented  
 Wood Shop  
 General Shop  
 Small Machine Repair Shop  
 Darkroom  
 Gym

Category B - Support Teaching

Counseling/Testing  
 Teacher Workroom  
 Teacher Offices  
 Educational Resource Storage  
 Time-out Room  
 Parent Resource Room

Category C - General Support

Student Commons/Lunch Room  
 Auditorium  
 Pool  
 Weight Room  
 Multipurpose Room  
 Boys Locker Room  
 Girls Locker Room  
 Administration  
 Nurse  
 Conference Rooms  
 Community Schools/PTA Administration  
 Kitchen/Food Service  
 Student Store

Category D - Supplementary

Corridors/Vestibules/Entryways  
 Stairs/Elevators  
 Mechanical/Electrical  
 Passageways/Chaseways  
 Supply Storage & Receiving Areas  
 Restrooms/Toilets  
 Custodial  
 Other Special Remote Location Factors  
 Other Building Support



## TABLE NO. 5

### ABBREVIATIONS

\$	=	Dollars
SF	=	Square Foot
LS	=	Lump Sum
EA	=	Each
GAL	=	Gallons
CY	=	Cubic Yards
CR	=	Classroom



## TABLE NO. 6

### STATEMENT OF SPECIFICATIONS

Consideration for pricing of unit costs in the Program Demand Cost Model for Alaskan Schools is based on superior level of specifications generally applied to new construction throughout the state. The reason being is that these schools are subject to hard usage, by day for educational use housing a significant number of students, faculty and support staff, at other times schools are also used by the communities for a variety of functions.

To place the standard of specifications used on Alaskan schools in every day words, it will be reasonable to say that the quality of materials, workmanship and equipment specified is well above residential facilities, above a standard office building, probably similar to an airport and a little lower than a medical center.

Since the early 1970s, Alaska has tried to consider future operations and maintenance cost impacts in the funding of new school programs in the hope that a better funded project would allow for a more economic facility in terms of Life Cycle Cost for the reason schools have designed to a superior level of specification.

In recent years some significance has been placed on ecological concerns that are both earth friendly and long term cost savings.

#### *CONCRETE:*

Strength of concrete often is specified to a minimum of 4,000 psi.

#### *MASONRY:*

Many areas in Alaska are Seismic Zone 4. Design of masonry work calls for significant reinforcing and support.

#### *METALS:*

Many areas in Alaska are Seismic Zone 4. Design of structural elements have enhanced strength connections and cross bracings.

#### *WOODS AND PLASTICS:*

Rough carpentry lumber at a minimum No. 2 grade, plywood (structural I) and finish work to a good quality with plastic laminate finish.

Wood framed buildings are also designed for Seismic Zone 4.



## TABLE NO. 6

### STATEMENT OF SPECIFICATIONS

#### *THERMAL AND MOISTURE PROTECTION:*

Thermal insulation in walls, R-19 and R-30, and roof R-50. Roofing material EPDM or Klip Rib metal, the building sealed with Tyvek and joint sealants.

#### *OPENINGS:*

Superior quality doors, frames and hardware. Windows Low E and insulated.

#### *FINISHES:*

Standard school finishes. Gypboard walls, acoustical tile ceilings, carpet and vinyl flooring with ceramic tile in bathroom toilets.

#### *SPECIALTIES:*

Higher quality toilet partitions and toilet accessories, painted metal lockers and comprehensive signage.

#### *EQUIPMENT:*

Superior quality kitchen equipment, stainless steel worktops, good quality sports equipment.

#### *FURNISHINGS:*

Plastic laminate finish to casework. Window coverings and entry mats.

#### *MECHANICAL:*

Copper water piping, insulated cast iron waste, American Standard fixtures.

Weil McLane boilers, hydronic heating, air handling with some cooling and exhaust system with digital controls.

Fully sprinklered fire suppression system throughout the school.

#### *ELECTRICAL:*

Good quality switchgear, panels and transformers, copper wiring all in conduit backed up with a standby generator. Lighting with energy saving lamps and good quality devices. Fire alarm system and all low voltage system currently used in modern Alaskan schools.