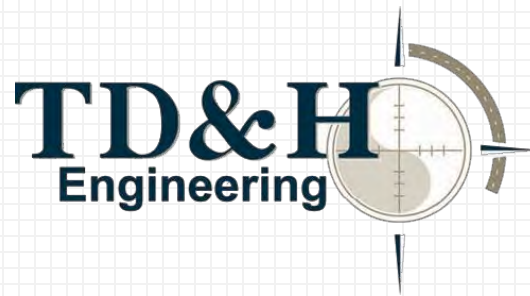


MONTANA ASSOCIATION OF SCHOOL BUSINESS OFFICIALS

FACILITIES PLANNING AND FINANCING WORKSHOP

TD&H Engineering | 1800 River Drive North Great Falls, Montana 59401 | 406.761.3010



September 15, 2016

**DIAGNOSING FACILITY
AND INFRASTRUCTURE
CONCERNS AND
FINDING SOLUTIONS**

INTRODUCTION



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TD&H Engineering Great Falls, MT

Licensed Structural Engineer PE

Experience

- School Projects - *expansion, renovation, reroofs*
- Industrial
- Commercial
- Government and Military
- Retail
- Municipal
- Bridges
- Medical
- Structural investigations

INTRODUCTION (CONT.)



What are some facility concerns or problems you are experiencing in your school district (ie. older buildings, ventilation, technology, not enough room, etc.)?

INTRODUCTION (CONT.)



- I. RECOGNITION OR DETERMINATION OF NEED**
1 week to months or years.
- II. STUDY PROBLEM & DETERMINE POTENTIAL SOLUTIONS**
1 month to years.
- III. DEVELOP A FUNDING PLAN & SECURE FUNDS**
6 months to 2 years.
- IV. DESIGN A SOLUTION TO THE FIX**
1 month to 1 year – depending on the size of the project.
- V. BID THE PROJECT**
1 month.
- VI. CONSTRUCTION**
2 months to 2 years or longer.

Total Project Timeline = 1 to 6 years for Outside-Funded Projects

HAVRE HIGH SCHOOL



HAVRE HIGH SCHOOL



HAVRE HIGH SCHOOL



HAVRE HIGH SCHOOL



I. RECOGNITION OR DETERMINATION OF NEED

1 week to months or years.

II. STUDY PROBLEM & DETERMINE POTENTIAL SOLUTIONS

1 month to years.

III. DEVELOP A FUNDING PLAN & SECURE FUNDS

6 months to 2 years.

IV. DESIGN A SOLUTION TO THE FIX

1 month to 1 year - depending on the size of the project.

V. BID THE PROJECT

1 month.

VI. CONSTRUCTION

2 months to 2 years or longer.

Total Project Timeline = 1 to 6 years for Outside-Funded Projects

I. RECOGNITION OR DETERMINATION OF NEED



1 week to months or years.

Some needs are obvious

- Roof leaks
- Foundation movement
- Lighting or mechanical issues
- Class size
- Cracks in walls
- Etc.



Malta Public Schools

Must meet health, safety concerns & educational functionality needs

Local, state and federal health requirements

- Mechanical
- Electrical
- Structural
- Functional Needs
- Air Quality



Infrastructure Examples:

- *Roofing concerns - leaks*
- *Structural deficiencies – cracking foundations, heaving slabs, etc.*
- *Not enough space or improper egress*
- *Improper ventilation*
- *Asbestos or lead-based paint*

Mt. Olivet

Must meet current local, state or federal codes & requirements

- New Buildings must meet 2012 IBC, plumbing & electrical codes
- Look at MT website for applicable codes listing <http://bsd.dli.mt.gov/building-codes-permits/current-codes>
- Many existing buildings can be grandfathered in & don't have to meet all parts of new code unless there is a safety or health risk



Brady High School

Design professionals can help you understand and meet code requirements

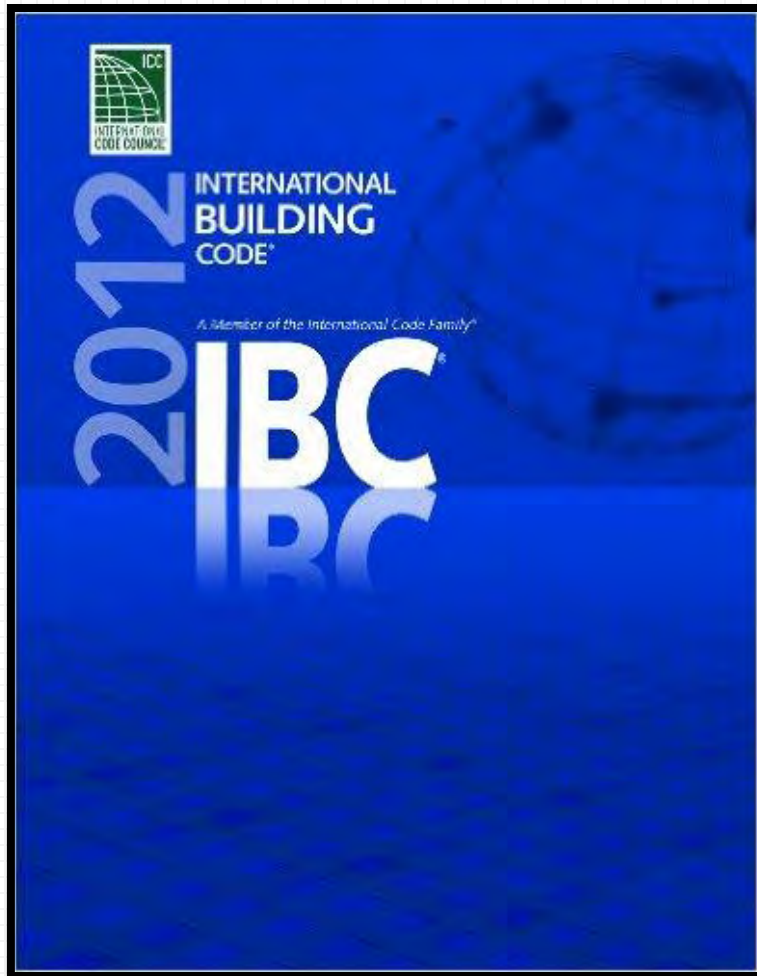
- International Building Code, 2012 Edition
- International Residential Code, 2012 Edition
- International Existing Building Code, 2012 Edition
- Uniform Plumbing Code, 2012 Edition
- International Mechanical Code, 2012 Edition
- International Fuel Gas Code, 2012 Edition
- NFPA 99c, Standard on Gas and Vacuum Systems (med gas), 2012 Edition
- National Electrical Code, 2014 Edition
- International Energy Conservation Code, 2012 Edition
- American Society of Mechanical Engineers, Boiler and Pressure Vessel Code, 2004 Edition
- American Society of Mechanical Engineers, publication CSD-1, Controls and Safety Devices for Automatically Fired Boilers, 2002 Edition
- National Board of Boiler and Pressure Vessel Inspectors, National Board Inspection Code, 2004 Edition
- Safety Code for Elevators and Escalators, ASME A17.1, 2004 Edition, A17.1a 2005 Addenda, and ASME A17.1S, 2005 Supplement
- Safety Code for Existing Elevators and Escalators, ASME A17.3, 2002 Edition
- Safety Standard for Platform Lifts and Stairway Chairlifts, ASME A18.1, 2003 Edition
- ASME A17.1, 2004 Edition, Appendix N, Table N1, Recommended Inspection and Test Intervals in Months.
- International Swimming Pool and Spa Code, 2015 Edition
- Wildland Urban Interface Code, 2012 Edition

NOTE: All of the codes listed above are amended by [Administrative Rules of Montana \(ARM\) Title 24, Chapter 301](#)

I. RECOGNITION OR DETERMINATION OF NEED



IBC & IEBC



Note: Owner's representatives and Design Professionals trained to understand code. Owner understanding not required.

TABLE OF CONTENTS	
CHAPTER 1 SCOPE AND ADMINISTRATION 1	
PART 1—SCOPE AND APPLICATION 1	
Section	
101 General 1	
102 Applicability 1	
PART 2—ADMINISTRATION AND ENFORCEMENT 2	
103 Department of Building Safety 2	
104 Duties and Powers of Building Official 2	
105 Permits 4	
106 Floor and Roof Design Loads 6	
107 Submittal Documents 6	
108 Temporary Structures and Uses 7	
109 Fees 7	
110 Inspections 8	
111 Certificate of Occupancy 9	
112 Service Utilities 9	
113 Board of Appeals 9	
114 Violations 10	
115 Stop Work Order 10	
116 Unsafe Structures and Equipment 10	
CHAPTER 2 DEFINITIONS 11	
Section	
201 General 11	
202 Definitions 11	
CHAPTER 3 USE AND OCCUPANCY CLASSIFICATION 41	
Section	
301 General 41	
302 Classification 41	
303 Assembly Group A 41	
304 Business Group B 42	
305 Educational Group E 42	
306 Factory Group F 42	
307 High-hazard Group H 43	
308 Institutional Group I 48	
309 Mercantile Group M 49	
310 Residential Group R 49	
311 Storage Group S 50	
312 Utility and Miscellaneous Group U 51	
CHAPTER 4 SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY 53	
Section	
401 Scope 53	
402 Covered Mall and Open Mall Buildings 53	
405 High-rise Buildings 57	
404 Atriums 60	
405 Underground Buildings 61	
406 Motor-vehicle-related Occupancies 62	
407 Group I-2 66	
408 Group I-3 69	
409 Motion Picture Projection Rooms 71	
410 Stages, Platforms and Technical Production Areas 72	
411 Special Amusement Buildings 74	
412 Aircraft-related Occupancies 74	
413 Combustible Storage 77	
414 Hazardous Materials 78	
415 Groups II-1, II-2, II-3, II-4 and II-5 81	
416 Application of Flammable Finishes 91	
417 Drying Rooms 91	
418 Organic Coatings 91	
419 Live/work Units 91	
420 Groups I-1, R-1, R-2, R-3 and R-4 92	
421 Hydrogen Fuel Gas Rooms 93	
422 Ambulatory Care Facilities 93	
423 Storm Shelters 94	
424 Children's Play Structures 94	
425 Hyperbaric Facilities 95	
426 Combustible Dusts, Grain Processing and Storage 95	
CHAPTER 5 GENERAL BUILDING HEIGHTS AND AREAS 97	
Section	
501 General 97	
502 Definitions 97	
503 General Building Height and Area Limitations 97	
2015 INTERNATIONAL BUILDING CODE®	xxi

I. RECOGNITION OR DETERMINATION OF NEED



IBC & IEBC

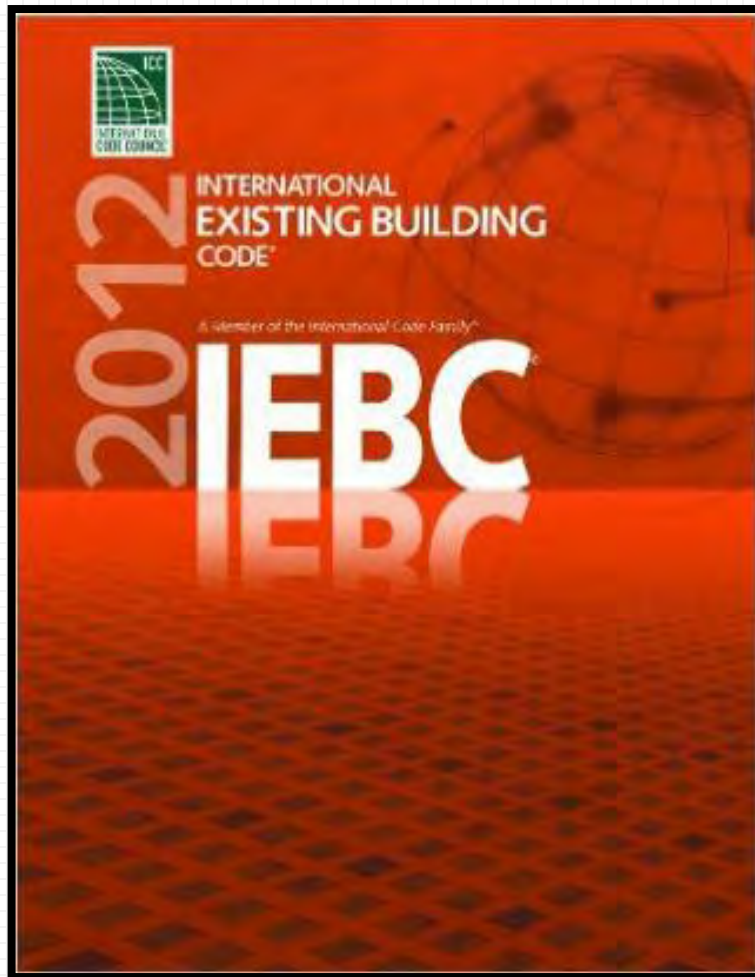


TABLE OF CONTENTS

CHAPTER 1 SCOPE AND ADMINISTRATION..... 1	405	Fire Escapes	18
PART 1—SCOPE AND APPLICATION..... 1	406	Glass Replacement.....	18
Section	407	Change of Occupancy	18
101 General	408	Historic Buildings	19
102 Applicability.....	409	Moved Structures	19
	410	Accessibility for Existing Buildings	19
PART 2—ADMINISTRATION AND ENFORCEMENT	1	CHAPTER 5 CLASSIFICATION OF WORK	23
103 Department of Building Safety.....	1	Section	
104 Duties and Powers of Code Official.....	2	501 General	23
105 Permits	3	502 Repairs	23
106 Construction Documents	5	503 Alteration—Level 1.....	23
107 Temporary Structures and Uses	6	504 Alteration—Level 2.....	23
108 Fees.....	6	505 Alteration—Level 3.....	23
109 Inspections	7	506 Change of Occupancy	23
110 Certificate of Occupancy	7	507 Additions	23
111 Service Utilities	8	508 Historic Buildings	23
112 Board of Appeals	8	509 Relocated Buildings.....	23
113 Violations	8	CHAPTER 6 REPAIRS.....	25
114 Stop Work Order	9	Section	
115 Unsafe Buildings and Equipment.....	9	601 General	25
116 Emergency Measures	9	602 Building Elements and Materials.....	25
117 Demolition	10	603 Fire Protection	25
CHAPTER 2 DEFINITIONS.....	11	604 Means of Egress.....	25
Section		605 Accessibility.....	25
201 General	11	606 Structural	25
202 General Definitions	11	607 Electrical	26
CHAPTER 3 COMPLIANCE METHODS	13	608 Mechanical.....	26
Section		609 Plumbing	27
301 Compliance Methods	13	CHAPTER 7 ALTERATIONS—LEVEL 1.....	29
CHAPTER 4 PRESCRIPTIVE COMPLIANCE METHOD.....	15	Section	
Section		701 General.....	29
401 General	15	702 Building Elements and Materials.....	29
402 Additions	15	703 Fire Protection	29
403 Alterations	16	704 Means of Egress.....	29
404 Repairs	17	705 Accessibility.....	29
		706 Structural	30
		707 Energy Conservation	31

Accreditation Standards

- School Districts must meet accreditation standards outlined in the MT Annotated Code.

<http://leg.mt.gov/bills/mca/20/7/20-7-101.htm>



Browning High School

I. RECOGNITION OR DETERMINATION OF NEED



Montana Code Annotated 2015

[Previous Section](#) [MCA Contents](#) [Part Contents](#) [Search](#) [Help](#) [Next Section](#)

20-7-101. Standards of accreditation. (1) Standards of accreditation for all schools must be adopted by the board of public education upon the recommendations of the superintendent of public instruction. The superintendent shall develop recommendations in accordance with subsection (2). The recommendations presented to the board must include an economic impact statement, as described in [2-4-405](#), prepared in consultation with the negotiated rulemaking committee under subsection (2).

(2) The accreditation standards recommended by the superintendent of public instruction must be developed through the negotiated rulemaking process under Title 2, chapter 5, part 1. The superintendent may form a negotiated rulemaking committee for accreditation standards to consider multiple proposals. The negotiated rulemaking committee may not exist for longer than 2 years. The committee must represent the diverse circumstances of schools of all sizes across the state and must include representatives from the following groups:

- (a) school district trustees;
- (b) school administrators;
- (c) teachers;
- (d) school business officials;
- (e) parents; and
- (f) taxpayers.

(3) Prior to adoption or amendment of any accreditation standard, the board shall submit each proposal, including the economic impact statement required under subsection (1), to the education and local government interim committee for review at least 1 month in advance of a scheduled committee meeting.

(4) Unless the expenditures by school districts required under the proposal are determined by the education and local government interim committee to be insubstantial expenditures that can be readily absorbed into the budgets of existing district programs, the board may not implement the standard until July 1 following the next regular legislative session and shall request that the same legislature fund implementation of the proposed standard.

(5) Standards for the retention of school records must be as provided in [20-1-212](#).

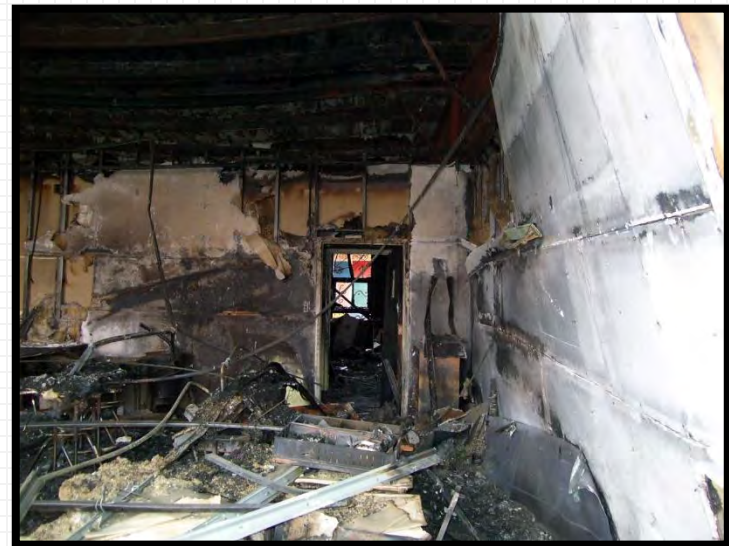
History: En. 75-7501 by Sec. 372, Ch. 5, L. 1971; R.C.M. 1947, 75-7501; amd. Sec. 2, Ch. 543, L. 1983; amd. Sec. 4, Ch. 208, L. 2005; amd. Sec. 2, Ch. 379, L. 2015.

Energy Efficiency

- Electrical, Mechanical, Functionality
- Energy audits, energy models, analysis of utility costs



Hays School



Hays School

Technology

- Improvements to enhance education, technology needs

Examples:

- *Broadband Internet*
- *Computers*
- *ITV*
- *Etc.*



Glasgow High School

Educational Opportunities

- Improvements that can enhance educational opportunities

Examples:

- *Renovations*
- *Additions*
- *New construction*
- *Developing cooperatives or consolidation*



Belgrade School

When to select a Design Professional (DP)

I. RECOGNITION OR DETERMINATION OF NEED

DP can help determine needs. Some Districts can do this on their own.

II. STUDY PROBLEM & DETERMINE POTENTIAL SOLUTIONS

- DP can help with solutions to problems.
- DP has design experiences with similar projects from other Districts.

When to select a Design Professional (DP) (cont.)

III. DESIGN A SOLUTION TO THE FIX

DP can help write funding applications and look into funding sources.

IV. BID THE PROJECT

DP needs to be involved here

V. CONSTRUCTION

DP should be involved to provide Quality Assurance.

I. RECOGNITION OR DETERMINATION OF NEED



Contact Search Calendar Get Answers

Home Programs Educator Licensure Reports & Data Curriculum & Assessment Resources **Finance & Grants** Employment

Grants » Finance & Grants

SCHOOL FACILITIES CONDITION INVENTORY



During the December 2005 Special Session, the legislature appropriated funds to conduct a facilities condition inventory. This study is administered by Architecture and Engineering Division of the Department of Administration in two phases.

Phase 1 is a brief survey completed by each school district in 2006.& The survey asked for basic information on the school buildings in each district. This information has been compiled and will be used as baseline data for Phase 2.

Phase 2, beginning December 2007, is an on-site assessment of all K-12 school facilities and their associated support structures in Montana. These assessments will be conducted at each school site by the DLR Group in addition to various local architecture and engineering firms.

The final report of Phase II assessment results will be presented to the State Legislature by June 30, 2008, and copies will be available to all school districts.

Timeline

August 23, 2006	Survey became available online
October 12-13, 2006	Survey Summary provided to Interim Legislative Finance Committee
December, 2007	Phase 2 Begins

[Phase II Final Report \(7-1-08\)](#)
[Phase II Detailed Reports](#)
[Special Session Legislation](#)
[Scope of the Survey](#)
[Background School Data Information Survey](#)
[Status Report as of 9/13/06](#)
[K-12 Facility Condition Assessments, Phase II](#)
[Phase II Facility Appendix](#)

Click on "School Facility Inventory"

[Phase II Final Report \(7-1-08\)](#)
[Phase II Detailed Reports](#)
[Special Session Legislation](#)
[Scope of the Survey](#)
[Background School Data Information Survey](#)
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[K-12 Facility Condition Assessments, Phase II](#)
[Phase II Facility Appendix](#)

http://opi.mt.gov/Finance&Grants/Index.html?gpm=1_5

Foundations (1)

Footings/Foundation Walls (A)

PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Stem Walls	Stem or basement walls cracked, allowing moisture penetration. Route and seal cracks.	
			Foundation	Foundation system settling or pulling away. Provide steel pier "ram jack" supports & patch breaks/cracks	



Exterior Steps/Retaining Walls (B)

PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Finish	Exterior steps spalling. Prep, sack, and patch treads and risers	
			Railing	Exterior step railing broken or pulled out. Replace railing.	
			Steps / Structure	Exterior steps settling away from building. Remove and replace steps and railing.	
			Retaining Walls (attached)	Retaining walls (attached to bldg.) broken & settling or shifting out of vertical. Remove & replace wall.	

Envelope (2)

Exterior Walls (A)

PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Concrete Tilt Up	Cracks, spalls, and/or re-bar visible. Patch & paint	
			Masonry Mortar	Masonry grout joints show multiple voids & cracking, but the units themselves are in tact. Prep & re-point.	
			Masonry Unit / Glass Block	Units are cracked, spalled, and/or coming loose. Remove and replace units.	
			Wood/Plaster/Metal	Siding is delaminating, buckling, or otherwise physically failing. Remove, replace, and finish.	
			Paint/Sealer	Paint peeling / masonry/conc. shows efflorescence Siding is in tact. Clean, prep and re-apply finish.	
			Insulation	Insulation known to be not present in the wall cavity. Provide interior openings, blow-in insulation, patch.	

Exterior Windows (B)

PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Glass	Glass is cracked and/or glazing putty is failing. Remove and replace glass.	
			Single Pane	Window assembly is single pane. Remove & replace window assembly.	
			Hardware	Hardware operators are broken, limiting operation. Remove and replace hardware only.	
			Frame	Frame or sash is physically broken so as to be inoperable. Remove & replace window assembly.	

Exterior Doors/Hatches (C)

PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Hardware	One or more components are dysfunctional, but the door is in tact. Remove and replace all hardware.	
			Door	The door is physically damaged, but frame in tact. Replace door only. Reinstall hardware	
			Frame	The frame is split or separating from wall. Replace frame only. Re-install (e) door & hardware	
			Overhead Door	Door binds to point of not operable. Replace.	
			Hatches	The roof hatch is allowing in moisture or is dysfunctional. Remove, replace, and re-flash curb.	



Interior Columns/Beams (D)

PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Wood	Settling, shifting, or separating is visible from cracked finishes. Shore, remove and replace the failing members, and repair finishes.	
			Concrete/Steel	Settling, shifting, or separating is visible from cracked finishes. Shore, remove and replace the failing members, and repair finishes.	

Floor System (3)

Floor Structure (A)

PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Slab	Concrete slab on grade has differential cracks but not effecting rest of structure. Remove, re-establish sub-grade, pour back & replace effected finishes	
			Raised Floor Wood	Floor sagging or showing other similar such failure. Shore back into level condition, replace / re-enforce structural members, and replace effected finishes	
			Raised Floor Concrete/Steel	Floor sagging or showing other similar such failure. Shore back into level condition, replace / re-enforce structural members, and replace effected finishes	

Stair Treads/Risers (B)

PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Stair Finishes	Interior tread and riser finishes separating from substrate (not just worn). Remove and replace the existing finishes throughout the entire stair flight.	
			Stair Rails	Interior stair railings physically broken or coming disassembled. Remove and replace with new.	
			Stair Structure	Stair flight is settling or the under-structure physically failing. Remove and replace flight, including rails.	

Roof System (4)



Structure (A)					
PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Wood	Dry rot observed from underside or clearly sagging. Replace supports and deck & repair roof covering.	
			Concrete/Steel	Steel/concrete beams and deck clearly deflecting. Replace supports and deck & repair roof covering.	

Covering (B)					
PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Flashing	Obvious lifting, seam separation, or corrosion. Remove and replace.	
			Roof drainage	Interior drains, gutters, or scuppers are not functional or corroded to point of failure. Replace	
			Skylights	Leaking or glazing seals failed. Remove and replace	
			Asphalt Shingle Tiles	History of leaks / exhibiting curling, lifting, or missing tiles. Replace roofing & associated flashing to match	
			Membrane/Metal	History of leaks / seams separating, punctured, or lifting at edges. Replace roofing, rigid insulation & associated flashing to match	
			Clay / Cement Tiles	History of leaks, exhibiting lifting, or missing tiles. Replace tiles & associated flashing to match	

Insulation (C)					
PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Batt	Insulation non-existent. Roof is pitched or membrane not being replaced. String batts to underside of deck	

Finishes (5)

Interior Walls (A)					
PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Framed - GWB	Framing obviously out of plumb, or large surface holes and breaks. Remove and replace assembly.	
			Framed - Plaster	Framing obviously out of plumb, or surface blisters, cracking, or spalling. Remove and replace assembly	
			Masonry	Grout joints have voids and & spalling out. Re-point.	

Ceilings (B)					
PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Plaster / GWB	Sagging, cracking, or spalling. Remove and replace.	
			Lay In	Fiber-based ceiling tiles are damaged or ceiling grid has deflected. Remove & replace ceiling system.	
			Wood/Specialty	Specialized ceiling system (wood slat, hidden spline, metal, etc.) has deflection or other physical damage beyond minor stains. Remove and replace in-kind.	

Interior Doors/Hardware/Windows (C)



PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Hardware	One or more components are dysfunctional, but the door is in tact. Remove and replace all hardware.	
			Door	The door is physically damaged, but frame in tact. Replace door only. Reinstall hardware	
			Frame	The frame is split or separating from wall. Replace frame only. Re-install (e) door & hardware	
			Relites / Interior Windows	Glass and/or stops are broken. Remove and replace glazing and stops. Frame to remain.	

Floor Finishes (D)

PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Resilient	Vinyl tile is popping up, or sheet vinyl has blisters or separating seams. Remove and replace.	
			Carpet	Rippled, seams separating, or face yarn unraveling. Remove and replace.	
			Ceramic/Stone/Terrazzo	Broken tiles. Remove, replace, and re-grout.	
			Wood	Boards are split or warped. Remove and replace	

Wall Finishes (E)

PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Paint	Paint is peeling or known to contain lead. Worn or dated alone is 'No Action'. Prep and re-paint.	
			Wall Covering / FRP	Wall covering is blistered, peeling off or separating at seams. Remove and replace.	
			Ceramic/Stone Tile	Broken tiles. Remove, replace, and re-grout.	

Specialties (6)

Toilet Partitions (A)

PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Metal/Other	Structurally failing in some manner or doors fallen from hinges. Remove and replace.	

Signage/Directories (B)

PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Directory	Structurally failed or vandalized to a point of not functional. Remove and replace in-kind.	
			Room & Directional Signs	Fallen off or physically broken. Replace to match.	

Fixed Seating/Risers (C)

PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Bleachers	Telescoping bleachers bind to a point of inoperable. Remove and replace each section in this condition.	
			Theater	Fabric is ripped or seats have failed structurally. Remove and replace entire seat w/back.	
			Classroom / Lecture	Desk top or seat broken off. Remove and replace.	
			Cafeteria	In-wall tables / benches bind to the point of not functioning. Remove and replace in-kind.	


Chalk/Tackboards/Cabinets (D)

PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Chalkboard/Markerboard	At least 25% of board surface does not retain ink/chalk. Remove and replace entire board.	
			Tackboard	Covering is ripped. Remove and replace board.	
			Cabinets	Doors or drawers are not functional, or counter has delaminated. Remove and replace.	

HVAC System (7)
Heating (A)

PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Controls	The sensors or valve actuators are dysfunctional. Replace those that are damaged w/programmable	
			BMS	No centralized, optimizing controls. Install.	
			Boiler/Furnace	Burner, combustion chamber, or fans are faulty beyond repair. Replace this central component.	
			Room Units	Baseboards or fin tubes not emitting heat. Remove & replace	
			Hydronic Piping	Piping damaged, leaking, or clogged beyond repair. Remove and replace piping, valves, and insulation	
			Alternative Fuel	Alternative fuel system inoperable. Replace.	

Ventilating (B)

PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Air Handler	The distribution fans and coils are dysfunctional. Remove and replace.	
			Ductwork	The duct work is physically damaged or designed in a manner restricting air flow. Remove and replace.	
			Specialized Exhaust	Area or equipment exhaust not functional or inadequate based on interview. Replace	
			Room Ventilators	The room ventilator no longer provides heat or air movement. Remove and replace it.	

Cooling (C)

PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Central AC	Compressor or fan coil are dysfunctional, & integrity of structure compromised. Remove and replace.	
			Room AC	No longer provides cooling. Remove and replace.	
			Hydronic Piping	Piping damaged, leaking, or clogged beyond repair. Remove and replace piping, valves, and insulation	

Plumbing System (8)



Fixtures (A)					
PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Sinks/Toilets>Showers	Fixture is broken or valve parts no longer available. Remove and replace fixture and valve.	
			Hot Water Generation	Multiple components (burners, peripherals, exchanger or combustion chamber) require overhaul. Water temp unreliable. Remove and replace.	
			Alternative Fuel	Alternative fuel system inoperable. Replace.	

Supply Piping (B)					
PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Piping	Leaks, clogged, or delivering discolored water. Remove and replace, including valves.	
			Pumps	Circulation pumps have fully failed or have history of repeated break downs. Remove and replace.	

Waste Piping (C)					
PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Piping	Pump, if there is one, is working properly, but sewer still backs up. Remove and replace piping.	
			Pump	Pump is observed to not function or breaks down repeatedly based on interview. Remove and replace.	

Electrical System (9)

Building Service (A)					
PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Transformer	If transformer is known to be owned by the school rather than the utility co - mark present, no action.	
			Meter Base	Overhead service mast is damaged. Replace	
			Generator	Generator known to be non-functional. Replace	
			Alternative Source	Power alt. (solar, wind, etc.) inoperable. Replace	

Lighting (B)					
PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Fixtures - PCB	Fixture ballasts are known to contain PCB's. Replace.	
			Fixtures - Energy	Lamps are T12 or incandescent. Replace.	
			Light Level Controls	Dual switching not functional. Replace.	
			Occupancy/Daylight Sensor	Sensors not present. Install as controls to (e) lights	
			Wiring	Wiring to fixtures is known to be failing. Replace.	

Distribution (C)					
PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Switchgear	Switchgear old - breakers / buckets are no longer available in those sizes AND there is no remaining capacity. Remove and replace switchgear.	
			Service Panels	Panels old - breakers / fuses no longer available AND no remaining capacity. Remove and replace.	
			Devices	Room outlets lack grounding prongs or GFI at wet locations. Replace.	
			Wiring	Wiring exhibits systemic failures or is known to not be in compliance with code. Remove and replace.	

Voice/Data (D)					
PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Intercom	The central portion of the system is inoperable. Remove and replace central portion and speakers.	
			Clock	The central portion of the system is inoperable. Remove and replace central portion and room clocks.	
			Telephone	The central portion of the system is inoperable. Remove and replace central portion & room handsets.	
			Data	Data access not provided in all instructional & admin areas. Provide at portions of building with no access.	

Conveying (10)

Elevator/Lift (A)					
PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Controls	The elevator controls from the hall or cab work intermittently or not at all. Remove and replace.	
			Communication	Emergency phone not operational. Replace.	
			Hoist Way	The hoist way mechanism within the shaft or elevator mechanical room has failed to a degree that the elevator has been shut down. Remove and replace associated equipment.	
			Lift	The stair or platform lift is inoperable. Minor damage is considered "No Action". Remove and replace lift.	

Safety System (11)

Egress (A)					
PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Exit Systems	Fire escape or slide has structurally failed or counterweight does not allow egress to ground. Remove & replace.	

Extinguishing System (B)					
PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Sprinkler	Sprinklers either non-existent or system not functional. Provide or replace as applicable.	
			Cabinet Systems	Fire hoses have rotted. Remove and replace. If hoses have been removed due to local Fire Marshall instruction - "No Action" required.	

Exit/Emergency Lighting/Alarms (C)

PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Exit Lights	The fixture above the exit doors are either no illuminated or non-existent. Provide or replace.	
			Emergency Lighting	The lighting along the path of egress is either not illuminated or non-existent. Install emergency lighting where otherwise not provided for.	
			Smoke/Heat Detection	Detection is either non-existent or inoperable. Provide and/or replace.	
			Fire Alarm System	Alarms are either non-existent, not per current code (ADA), or annunciator not present. Provide alarms in areas without and replace in non-ADA locations. If annunciator is non-existent or requires replacement - assume 100% system replacement.	

Asbestos/Hazardous Material (D)

PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Flooring	Vinyl tile, or glue, is known to be asbestos-positive. Regardless of condition, remove and replace with vinyl composite tile.	
			Other Asbestos Containing Material (ACM)	Asbestos material is known to be present. Regardless of condition, remove and replace with like material - record percentage of building impacted.	

ADA Accessibility (E)

PIC	P/A	% of Whole Bldg	Sub-Component	Condition Observed and Action to Fix	Location & Note
			Upgrade with Elevator	One level is off adjacent grade enough such that a ramp is not practical. Provide a single 2-stop elevator cab and hoist way.	
			Restrooms	Existing rooms are not configured to accommodate ADA requirements, but adequate square footage exists to re-configure without reducing fixture count. Re-configure to meet ADA.	
			Ramps	Differential with adjacent floor or grade is no greater than 60". Provide a concrete ramp with metal railing.	
			Stair & Ramp Rails	Handrails do not extend past last tread and/or return to wall. Modify railing.	
			Door Hardware	Existing hardware is not code compliant or auto opener is not functional. Remove & replace locksets, closers, & thresholds or replace auto opener	

- I. RECOGNITION OR DETERMINATION OF NEED**
1 week to months or years.
- II. STUDY PROBLEM & DETERMINE POTENTIAL SOLUTIONS**
1 month to years.
- III. DEVELOP A FUNDING PLAN & SECURE FUNDS**
6 months to 2 years.
- IV. DESIGN A SOLUTION TO THE FIX**
1 month to 1 year – depending on the size of the project.
- V. BID THE PROJECT**
1 month.
- VI. CONSTRUCTION**
2 months to 2 years or longer.

Total Project Timeline = 1 to 6 years for Outside-Funded Projects

II. STUDY PROBLEM & DETERMINE POTENTIAL SOLUTIONS



1 month to years.

Master Plan for 1, 5, 10 years and Beyond

(Typically Needed for Larger Districts)

- Master Plan (MP) process can help determine a lot of those items listed in Step I
- Some districts try to create MP themselves. Others hire an outside consultant
- MP usually performed to determine budget requirements
- Design & Construction Contingencies (5-10% of total project budget, more for remodels)
 - For Change Orders and Additional Services

II. STUDY PROBLEM & DETERMINE POTENTIAL SOLUTIONS (CONT.)



Havre Middle School (before)



Havre Middle School (during construction)

II. STUDY PROBLEM & DETERMINE POTENTIAL SOLUTIONS (CONT.)

Master Plan (cont.)



Havre Highland Park South Drilling

- What is the projected growth of the school or concern, using projected population trends
- May need to do preliminary investigations to determine if a site is adequate for a new building
 - Asbestos survey (already required by DEQ)
 - Geotechnical Study (expansive soils, etc.)
 - Lead based paint
 - Mold
- Is the cost for maintaining the existing facility less expensive than replacing it over a certain period of time (5 years, 10 years, etc.)
 - Perform Life- Cycle Cost Analysis (LCCA)

II. STUDY PROBLEM & DETERMINE POTENTIAL SOLUTIONS (CONT.)

Master Plan (cont.)

- If a problem is specifically known, a **FEASIBILITY STUDY** can be performed instead of a Master Plan.
- Internally or with a consultant (ie. Engineers or Architects)
 - Build new building or addition
 - Renovation of existing buildings
 - Will provide costs for performing renovations
- Owner's Representatives



Browning Vocational Technology Building

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1 week to months or years.
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III. DEVELOP A FUNDING PLAN & SECURE FUNDS

6 months to 2 years.

Hire a Team

- Design/Bid/Build
- Design/Build
- Construction Management at Risk
- State Law requires Engineers & Architects to be hired based on qualifications (bidding services not allowed)



III. DEVELOP A FUNDING PLAN & SECURE FUNDS (CONT.)



Consultants or Owner's Representative

- Can help in determining funding sources

Department of Commerce has information on potential funding sources

- <http://comdev.mt.gov/Resources#Grant-Resources-1001>

Educating & informing the public is important

III. DEVELOP A FUNDING PLAN & SECURE FUNDS (CONT.)



Quality Schools Grant Program

- <http://comdev.mt.gov/programs/qualityschools>

- From the Website:

“The Quality Schools Grant program provides school facility and technology grants, matching planning grants, and emergency grants for public school districts in Montana. The funds for Quality Schools grants come from the timber harvest on common school trust lands, and rental income received from power site leases deposited into the school facility and technology account.”

- Funding for:
 - Planning Grants: Money to pay for Preliminary Architecture/Engineering Reports (PAR, PER) and grant writing
 - Construction Grants: Money to pay for the construction
- Funding is as recommended by the Governor and then must be approved by legislature. The last legislature did not fund the construction or planning grants (2015).

III. DEVELOP A FUNDING PLAN & SECURE FUNDS (CONT.)



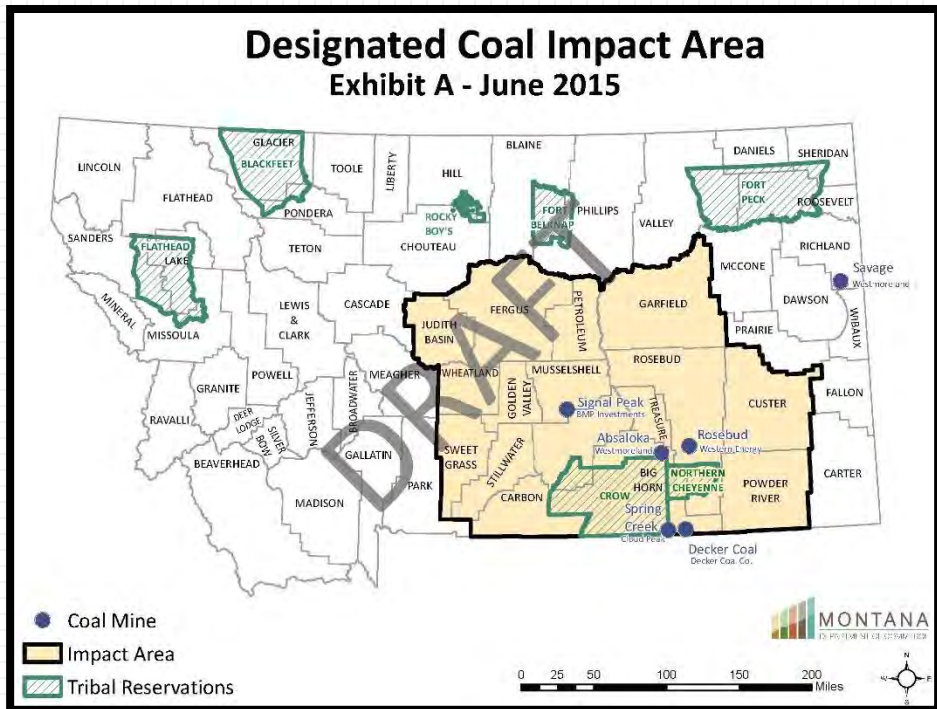
Who here has used Quality Schools grant funding?

Examples?

III. DEVELOP A FUNDING PLAN & SECURE FUNDS (CONT.)

Coal Board Funding

Designated Coal Impact Area
Exhibit A - June 2015



Approximate Coal Impact Area

- Geared to regions affected by coal processing
- Submit application to Coal Board: How the impact of coal production (increase or decrease) has affected your need for infrastructure improvements.
- <http://comdev.mt.gov/Boards/Coal/Resources#Coal-Board-Reports-and-Resources-1234>

III. DEVELOP A FUNDING PLAN & SECURE FUNDS (CONT.)



American Honda Foundation

- With the [American Honda Foundation](#), public schools are eligible to apply for grants ranging from \$20,000 to \$60,000 to assist with projects that emphasize youth education in the areas of science, technology, engineering, mathematics, the environment, job training and literacy. Grant applications are accepted four times each year and proposals should be submitted online.

American Honda
Foundation



III. DEVELOP A FUNDING PLAN & SECURE FUNDS (CONT.)



Grants.gov – Housing Resources

- From Community Development Website:

“This clearinghouse website, [Grants.gov](https://www.grants.gov), offers a variety of search categories to assist in finding federal grant opportunities that may be applicable to your project. For example, grants administered by the [U.S. Dept of Energy: Office of Energy Efficiency & Renewable Energy](https://www.eere.energy.gov) may be a good place to start.”

III. DEVELOP A FUNDING PLAN & SECURE FUNDS (CONT.)



US Department of Agriculture (USDA) Rural Development

- From Community Development Website:

“The USDA Rural Development program provides Community Facility Grants to assist in the development of essential community facilities (such as schools) in rural areas and towns of up to 20,000 in population.”



**United States
Department of
Agriculture**

III. DEVELOP A FUNDING PLAN & SECURE FUNDS (CONT.)



Other Possible Funding Sources

(mostly geared toward education needs, not infrastructure)

- <http://comdev.mt.gov/Resources#Grant-Resources-1001>
- Also available are Loans: Intercap Loans
 - American Honda Foundation
 - American Institute of Architects (AIA) Committee on Architecture for Education
 - Captain Planet Foundation
 - Charles M. Bair Family Trust
 - Environmental Protection Agency (EPA)
 - Grants.gov
 - Home Depot Building Healthy Communities Grant Program
 - Lowe's Toolbox for Education
 - Montana Coal Board
 - Montana Department of Environmental Quality
 - Montana Department of Natural Resources and Conservation (DNRC)
 - Montana Safe Routes to Schools
 - National Clearinghouse for Educational Facilities
 - Office of Public Instruction (OPI) Finance and Grants
 - State Farm Company Grants
 - The Association for Learning Environments (formerly CEFPI)
 - Treasure State Endowment Program (TSEP)
 - U.S. Department of Agriculture (USDA) Rural Development
 - U.S. Department of Education
 - Verizon Foundation



Lewis & Clark Elementary Reroof



Sunnyside Elementary

I. RECOGNITION OR DETERMINATION OF NEED

1 week to months or years.

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1 month to years.

III. DEVELOP A FUNDING PLAN & SECURE FUNDS

6 months to 2 years.

IV. DESIGN A SOLUTION TO THE FIX

1 month to 1 year – depending on the size of the project.

V. BID THE PROJECT

1 month.

VI. CONSTRUCTION

2 months to 2 years or longer.

Total Project Timeline = 1 to 6 years for Outside-Funded Projects

IV. DESIGN A SOLUTION TO THE FIX

1 months to 1 year
depending on project size.

Design Documents are **CRITICAL**

- Equal comparison between contractors
- Design fees range from 3% to 15% of the total construction budget (remodels cost more)

**Design will be based on funding available
and time frame for the need to present
itself**



*LEFT: Cascade School (before)
RIGHT: Cascade School (after)*

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V. BID THE PROJECT

1 month.

Public Invitation

- Design/Bid/Build
- Construction Management at Risk
- Design/Build



Butte Wittier Reroof

V. BID THE PROJECT

Design/Bid/Build

This is the traditional method for a project which involves the owner first contacting a design firm who then prepares project plan documents from which a contractor bids for construction. Low bid typically is awarded the project.



Rocky Boy School Addition

V. BID THE PROJECT



Design/Bid/Build

Possible Advantages

- The owner can control the design and construction of the project.
- The design changes can more easily be implemented prior to start of construction.
- Construction cost is fixed at the time of the bid opening.
- The design for the project is completed prior to construction.
- Maximum competition between contractors because a low bid cost is usually awarded.
- Contract administration is easier to control.
- The owner controls the design and construction quality of the project.

Possible Disadvantages

- Significant owner expertise is required or an owner's representative can provide this expertise.
- The owner is at risk to the contractor if there are design errors.
- The combined design and construction schedule tends to be longer.
- **No contractor input during design (value engineering).**

V. BID THE PROJECT

Construction Manager at Risk (CM@R)

This is a delivery method for which a construction manager (CM) is selected and required to deliver a project within a guaranteed maximum price (GMP) based off of construction documents. The CM will bid out each component of construction.



Construction Manager at Risk (CM@R)

Advantages

- The responsibility for construction and some risk is transferred from the owner to Construction Manager (CM).
- The construction cost is known and fixed during the design.
- The CM has control of the construction process and the subcontractors.
- Construction for the project can start prior to completion of the design which reduces the project schedule.

Disadvantages

- The owner has reduced control of the project.
- Any design changes that occur after construction can be costly.
- There is the potential conflict of interest if the CM is also the contractor (should bid all parts of the project).

V. BID THE PROJECT



Design/Build (DB)

The design build (DB) entity will include the design team and the contractor.

Advantages

- There is a single DB entity (typically a contractor with a hired design team) is responsible for the entire project.
- The construction often starts before the design is complete which reduces the project schedule.
- Construction costs are known and fixed during design.
- Design and construction risk is transferred to the DB entity.
- The project costs are more easily understood and controlled with this type of construction.
- There is less required owner expertise.

V. BID THE PROJECT



Design/Build (DB)

Disadvantages

- The owner has minimal control of the design and construction quality.
- This type of construction requires an extensive technical performance specification.
- Design changes that occur after construction can be costly.
- There can be conflicting interests between the designer and the contractor (ie. contractor may push designer for cheaper methods of construction).
- No owner's representative. There is no one responsible during the design or construction as the owner's representative.
- There are fewer bidders with this type of construction due to the fewer contractors with this type of experience.

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Total Project Timeline = 1 to 6 years for Outside-Funded Projects

VI. CONSTRUCTION

1 month.

Make sure to allot money for construction management by outside design team.

- Someone needs to make sure the Contractor is performing things according to the plans and that the school receives what they paid for

Change Orders

Contingencies



Wyola Reroof

PITFALLS TO AVOID



Make sure to hire a design team and not just a contractor directly

- This person can serve as an owner's representative to look after the interest of the owner
- The design team can provide specifications and plans on how a project is constructed
- Have Design Team or 3rd Party Inspector perform quality control to make sure project is constructed per plans

Example: Roof project comparing different proposals without plan documents

Make sure to leave enough time. Rushed projects cost more

SUMMARY



- **Determination of District's Needs**
- **Study problem to come up with a solution**
- **Look at funding sources**
- **Hire design team**
- **Remember that completion of a project can take a lot of time so plan accordingly**

QUESTIONS??



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