

# Concrete Coalition Phase II: Concrete Building Performance Record

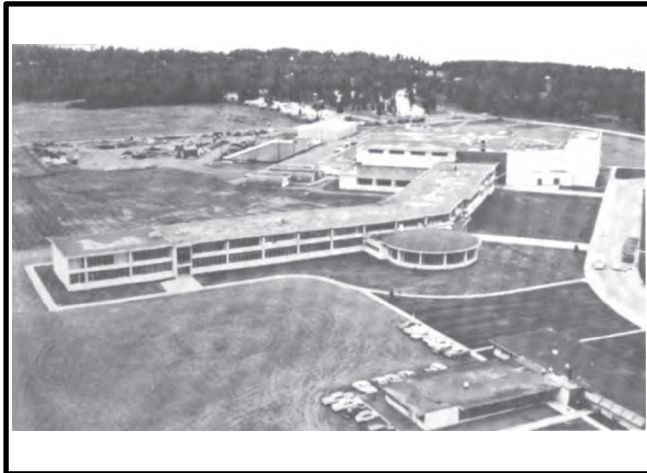
**Instructions:** This form is for use in collecting data for phase two of the Concrete Coalition project: Developing a Global Database of Concrete Buildings Damaged in Earthquakes. For more information about how to use this form, see the sample form or view the demo at: <http://concretecoalition.org>.

Record ID:

Building Name:

Prepared By:

## Section 1: Basic Building Information



General view of the West Anchorage High School after the earthquake and before reconstruction. (National Academy of Sciences, 1973)

Country:		
State/Province:		
City:		
Latitude:		
Longitude:		
Street Address:		
Occupancy:		
Height:		Ft, m
Number of Stories:		
Number of Stories below ground:		
Size:		gsf, sqm
Year Built:		
Original Code:		
Modification:		
Year Modified:		
Code of Modification:		

## Concrete Coalition Phase II: Concrete Building Performance Record

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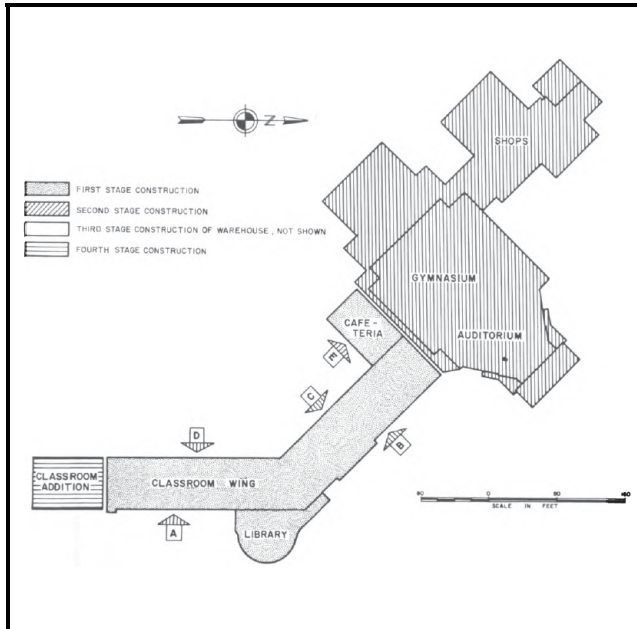
Prepared By:

### **Section 1: Basic Building Information**-(Continued)

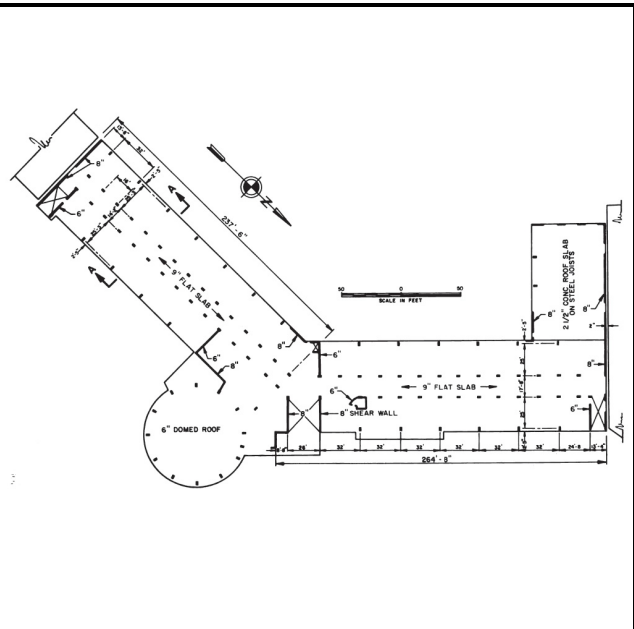
Lateral Load System:	
Other Lateral Load System:	
Vertical Load System:	
Other Vertical Load System:	
Foundation:	
Building Description:	

## Supplemental Basic Information:

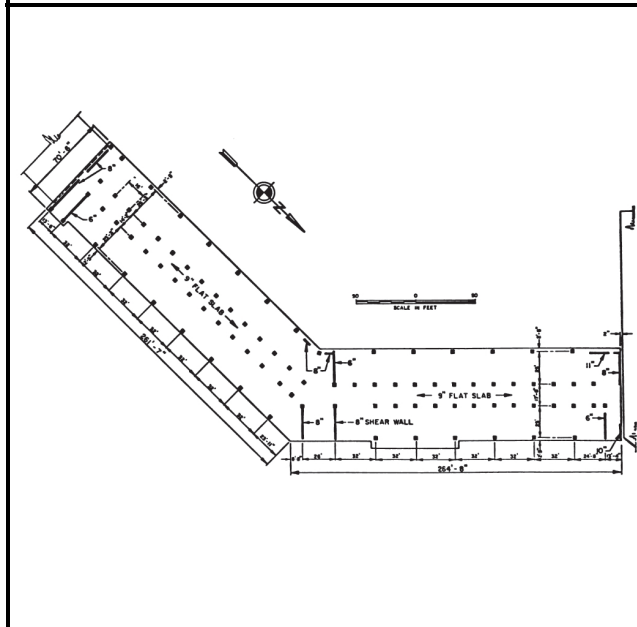
Paste in building plans, engineering drawings or sketches



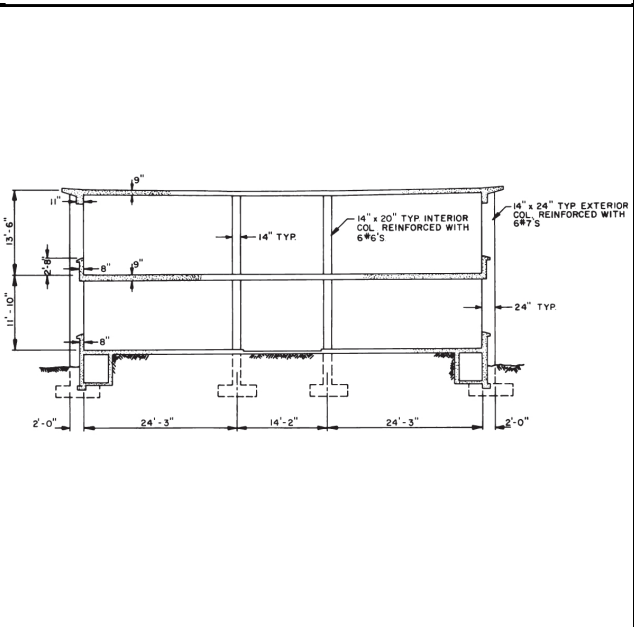
Pre-earthquake floor plan, West Anchorage High School. (National Academy of Sciences, 1973)



First floor plan of West Anchorage High School, showing column spacing. (National Academy of Sciences, 1973)



Second floor plan of West Anchorage High School, showing column spacing. (National Academy of Sciences, 1973)



Section A-A through the classroom wing showing typical column reinforcing. (National Academy of Sciences, 1973)

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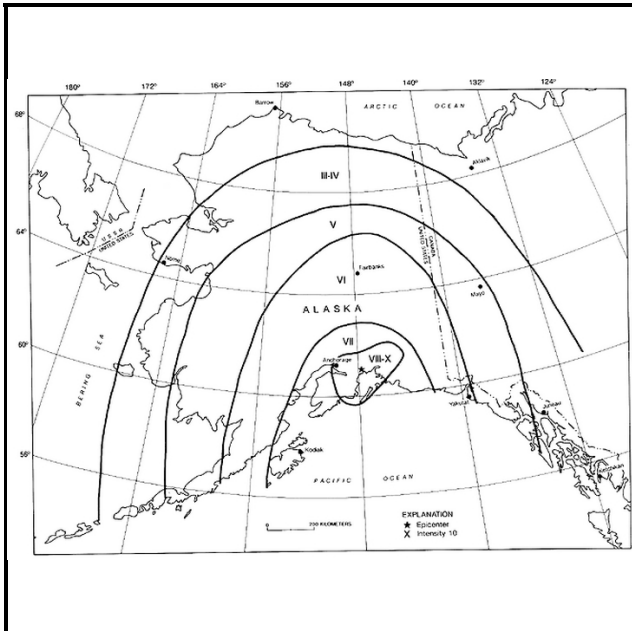
Prepared By:

### Section 2: Earthquake Information

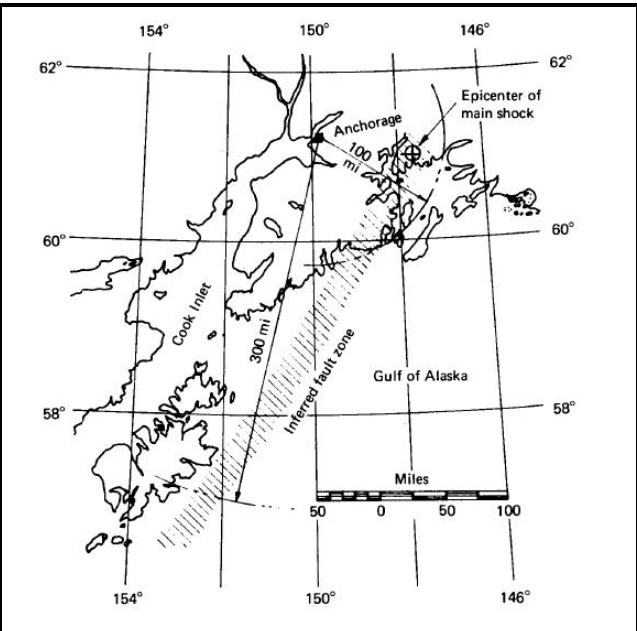
Earthquake Date:			
Moment Magnitude:			
Epicentral Distance (km):			
Local Intensity:		Intensity Scale:	
Site Description:			
PGA (max horizontal):			
PGA (vertical):			
SaT:			
Ground Motion Recording Stations:			
Distance to Station (km):			
Station Latitude:			
Station Longitude:			
Ground Motion Summary:			

**Additional Ground Motion Information:**

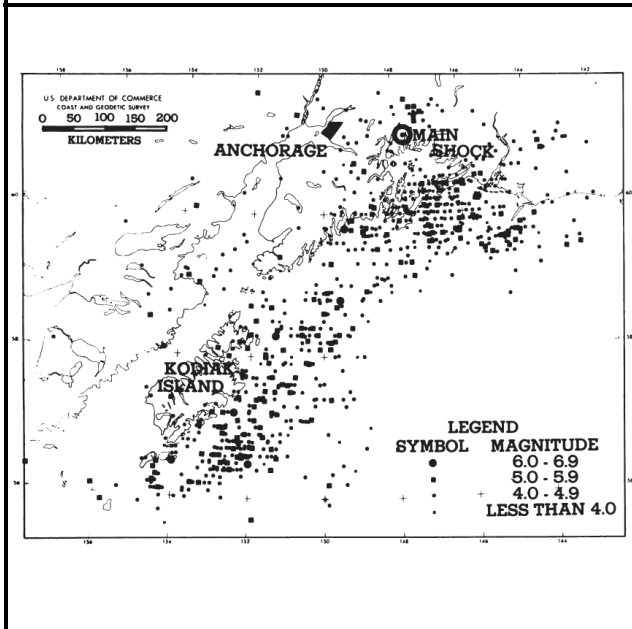
Paste in earthquake maps, spectra, or figures involving the ground motion at the building site



Isoseismal intensity map of the Alaska earthquake. (Von Hake and Cloud, 1966)



Probable direction of faulting. (Benuska and Clough, 1966)



Larger aftershocks of the 1964 Alaska earthquake. (National Academy of Sciences, 1973)

Insert image here

Type image caption here:

## Concrete Coalition Phase II: Concrete Building Performance Record

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### **Section 3: Damage Information**

Performance Summary:	
Damage State Description:	
Summary of Causes of Damage:	

## Concrete Coalition Phase II: Concrete Building Performance Record

Record ID:

Building Name:

Prepared By:

### **Section 4: Observed Design and Construction Characteristics**-Construction Quality

Notes	Contribution to Observed Damage				
	<u>Unlikely</u>	<u>Possible</u>	<u>Likely</u>	<u>Unknown</u>	<u>N/A</u>
<b>Materials</b>					
Concrete					
Reinforcing steel					
<b>Execution</b>					
Conveyance/ placement of concrete					
Rebar					
Field variance with design documents					
<b>Other Factors</b>					
Please Specify:					

## Concrete Coalition Phase II: Concrete Building Performance Record

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Building Name:

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### **Section 4: Observed Design and Construction Characteristics**-Configuration

	Notes	Contribution to Observed Damage				
		<u>Unlikely</u>	<u>Possible</u>	<u>Likely</u>	<u>Unknown</u>	<u>N/A</u>
<b>Plan Irregularities</b>						
Torsion						
Perimeter boundary						
Diaphragm						
Out-of-plane offsets in lateral resisting system						
Non-orthogonal systems						



## Concrete Coalition Phase II: Concrete Building Performance Record

Record ID:

Building Name:

Prepared By:

### **Section 4: Observed Design and Construction Characteristics**-Configuration-(Continued)

	Notes	Contribution to Observed Damage				
		<u>Unlikely</u>	<u>Possible</u>	<u>Likely</u>	<u>Unknown</u>	<u>N/A</u>
<b>Vertical Irregularities</b>						
Soft Story						
Weak story						
Mass distribution						
Geometric variability of lateral resisting system						
In-plane discontinuity of lateral resisting system						
Setbacks						
Change in stiffness						
<b>Other Factors</b>						
Please Specify:						

## Concrete Coalition Phase II: Concrete Building Performance Record

Record ID:

Building Name:

Prepared By:

### **Section 4: Observed Design and Construction Characteristics**-Lateral Load Resisting System-General

	Notes	Contribution to Observed Damage				
		<u>Unlikely</u>	<u>Possible</u>	<u>Likely</u>	<u>Unknown</u>	<u>N/A</u>
<b>Strength</b>						
Overall lack of strength						
<b>Stiffness</b>						
Extreme Flexibility						
<b>Load Path</b>						
Collectors/Struts						
Anchorage of nonstructural elements						
Out-of-plane capacity of walls						
Diaphragm chords						
Diaphragm openings						
<b>Other Factors</b>						
Please Specify:						

## Concrete Coalition Phase II: Concrete Building Performance Record

Record ID:

Building Name:

Prepared By:

### **Section 4: Observed Design and Construction Characteristics**-Lateral Load Resisting System-Frames

	Notes	Contribution to Observed Damage				
		<u>Unlikely</u>	<u>Possible</u>	<u>Likely</u>	<u>Unknown</u>	<u>N/A</u>
<b>Columns</b>						
Shear strength						
Flexural strength						
Axial load ratio ( $P/A_c/f_c'$ )						
“Vertical” load columns drift capacity						
Interference of frame action by infill						
<b>Beams</b>						
Strength relative to columns						
Shear controlled behavior						
Continuity of longitudinal reinforcing						
Loss of vertical capacity						

## Concrete Coalition Phase II: Concrete Building Performance Record

Record ID:

Building Name:

Prepared By:

### **Section 4: Observed Design and Construction Characteristics**-Lateral Load Resisting System-Frames-Continued

	Notes	Contribution to Observed Damage				
		<u>Unlikely</u>	<u>Possible</u>	<u>Likely</u>	<u>Unknown</u>	<u>N/A</u>
<b>Beams</b> –(continued)						
Interference of frame action by infill						
<b>Joints</b>						
Interior						
Exterior						
Corner						
<b>Other Factors</b>						
Please Specify:						

## Concrete Coalition Phase II: Concrete Building Performance Record

Record ID:

Building Name:

Prepared By:

### **Section 4: Observed Design and Construction Characteristics**-Lateral Load Resisting System-Shear Walls

Notes	Contribution to Observed Damage				
	<u>Unlikely</u>	<u>Possible</u>	<u>Likely</u>	<u>Unknown</u>	<u>N/A</u>
<b>Shear</b>					
Diagonal tension/compression					
Sliding shear					
Flexure/shear					
<b>Flexure</b>					
Compression zone buckling capacity					
Boundary reinforcing fracture/buckling					
Discontinuity of wall					
Boundary Reinforcing at openings					
<b>Other Factors</b>					
Please Specify:					

## Concrete Coalition Phase II: Concrete Building Performance Record

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Building Name:

Prepared By:

### **Section 4: Observed Design and Construction Characteristics**-Lateral Load Resisting System-Infills

	Notes	Contribution to Observed Damage				
		<u>Unlikely</u>	<u>Possible</u>	<u>Likely</u>	<u>Unknown</u>	<u>N/A</u>
Unreinforced						
Interference with frame action						
Out-of-plane						
Attachment to framing						
<b>Other Factors</b>						
Please Specify:						

## Concrete Coalition Phase II: Concrete Building Performance Record

Record ID:

Building Name:

Prepared By:

### **Section 4: Observed Design and Construction Characteristics**-Lateral Load Resisting System-Other

Notes	Contribution to Observed Damage				
	<u>Unlikely</u>	<u>Possible</u>	<u>Likely</u>	<u>Unknown</u>	<u>N/A</u>
<b>Foundations</b>					
Liquefaction					
Pile/pier tension capacity					
Spread footing capacity					
<b>Other:</b>					
Please Specify:					
<b>Miscellaneous</b>					
Pounding					
Surface Rupture					
<b>Other:</b>					
Please Specify:					

**Illustrations of damage:**

Paste in drawings, sketches or photos of building damage



Damage to West Anchorage High School. Window wall fell inwards into the classrooms. Note sag in roof due to failure of reinforced concrete diaphragm. (Comartin et al., 2004)



Close up view of damage to the column and beam joints at the second level of the classroom wing. (Comartin et al., 2004)



Close up view of second story columns and window sash, taken from the roof of the library. (National Academy of Sciences, 1973)



Close up view of pounding damage to the expansion joint between second floor of classroom wing and upper part of gymnasium. (National Academy of Sciences, 1973)



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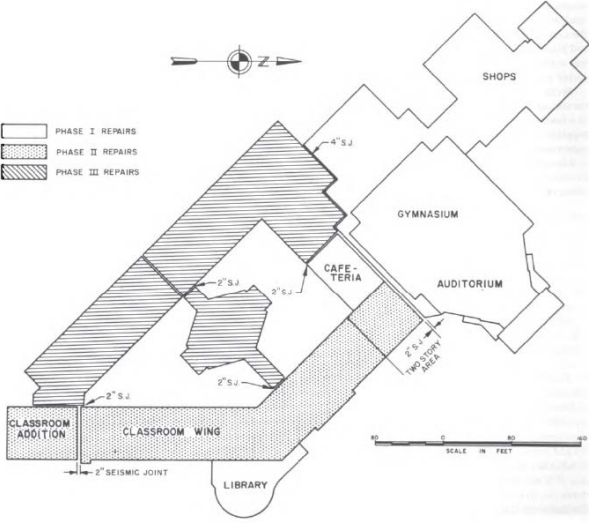
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### **Section 4: Repair and Retrofit Information**

Type of retrofit or repair:	
Other:	
Performance Level:	
Hazard Level:	
Code:	
Other:	
Lateral Analysis:	
Other:	
Design Strategy:	
Retrofit Summary:	

## Illustrations of Repair or Retrofit:

Paste in drawings, sketches or photos of building repair or retrofit

 <p>The floor plan illustrates the layout of the restored West Anchorage High School, including a Classroom Addition, Classroom Wing, Library, Cafeteria, Auditorium, Gymnasium, and Shops. A legend identifies three phases of repairs: Phase I (white), Phase II (diagonal hatching), and Phase III (cross-hatching). Seismic joints are marked with '2" S.J.' and '4" S.J.'. A scale bar indicates 0 to 40 feet, and a north arrow is present.</p>	<p>Insert image here</p>
<p>Floor plan of restored West Anchorage High School. (National Academy of Sciences, 1973)</p>	<p>Type image caption here:</p>
<p>Insert image here</p>	<p>Insert image here</p>
<p>Type image caption here:</p>	<p>Type image caption here:</p>

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<b>Additional Notes:</b>	
<b>Section 1</b>	
<b>Section 2</b>	
<b>Section 3</b>	
<b>Section 4</b>	

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### **Appendix 1: Supplemental Basic Information**

File Location	
File Caption	
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Prepared By:

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### **Appendix 2: Additional Ground Motion Location**

File Location	
File Caption	
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Prepared By:

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### **Appendix 3: Illustrations of Damage**

File Location	
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Prepared By:

### **Appendix 4: Illustrations of Repair/Retrofit**

File Location	
File Caption	
File Location	
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Record ID:

Building Name:

Prepared By:

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### Appendix 5: References

<b>Citation</b>	
Link to Purchase	
File Location	
<b>Citation</b>	
Link to Purchase	
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<b>Citation</b>	
Link to Purchase	
File Location	



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Record ID:

Building Name:

Prepared By:

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### **Appendix 5: References**-(Continued)

<b>Citation</b>	
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File Location	
<b>Citation</b>	
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