TABLE 2 - Test Results

Mark	Calculated Parameters		Flexural Strength			Shear Strength			Measured / Calculated		Observed Mode of Failure
						Measured		Calculated**			
	Moment to Shear Ratio M_u/V_u at $\ell_w/2$ from Base	Ratio d/ℓ_w at ultimate	Measured Moment, M_u, at base kip-ft.	Calculated* Moment, M_u, at base kip-ft.	Calculated M_u^+ kip-ft.	Shear, V_u, at $\ell_w/2$, kips	$\frac{V_u^{++}}{hd\sqrt{f'_c}}$	$\frac{v_c + v_s}{\sqrt{f'_c}}$	Moment at the Base	Shear at $\ell_w/2$ from Base	
SW-1	$2.0\ell_w$	0.58	406	379	356	26.5	1.7	3.9	1.07	0.44	Flexure
SW-2	$2.0\ell_w$	0.62	675	650	609	41.4	2.8	4.0	1.04	0.70	Flexure
SW-3	$2.0\ell_w$	0.71	1073	1200	1181	66.0	4.5	4.0	0.90	1.13	Flexure-Shear
SW-4	$1.0\ell_w$	0.71	1077	1139	1108	108.6	7.4	6.8	0.95	1.12	Flexure
SW-5	$1.0\ell_w$	0.78	1078	1121	-	108.6	7.8	6.8	0.96	1.15	Flexure-Shear
SW-6	$2.0\ell_w$	0.78	1179	1154	-	72.5	5.3	4.4	1.02	1.20	Flexure

* Based on compressive concrete limiting strain of 0.003, strain compatibility and measured material properties including strain hardening of steel.

** Calculated from ACI 318-71 Code shear strength equations.

\+ According to Eq. (1).

++ d used is $0.8\ell_w$ or greater.

(1 kip-ft. = 0.138 ton-m; 1 kip = 0.453 ton; $\sqrt{f'_c}$ psi = $0.265\sqrt{f'_c}$ kgf/cm^2)

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TABLE 3 - Moment-Curvature Test Results

Mark	Measured			Calculated		
	ψ_u Millionths/in.	$\frac{M_u}{M_y}$	$\frac{\psi_u}{\psi_y}$	ψ_u Millionths/in.	$\frac{M_u}{M_y}$	$\frac{\psi_u}{\psi_y}$
SW-1	228	1.13	7.0	186	1.17	4.8
SW-2	116	1.37	3.6	143	1.48	4.1
SW-3	94	1.29	1.8	103	1.43	2.5
SW-4	190	1.35	2.5	117	1.42	2.7
SW-5	225	1.18	3.3	133	1.30	3.4
SW-6	186	1.31	3.9	120	1.28	3.1

1 millionth/in. = 0.4 millionths/cm

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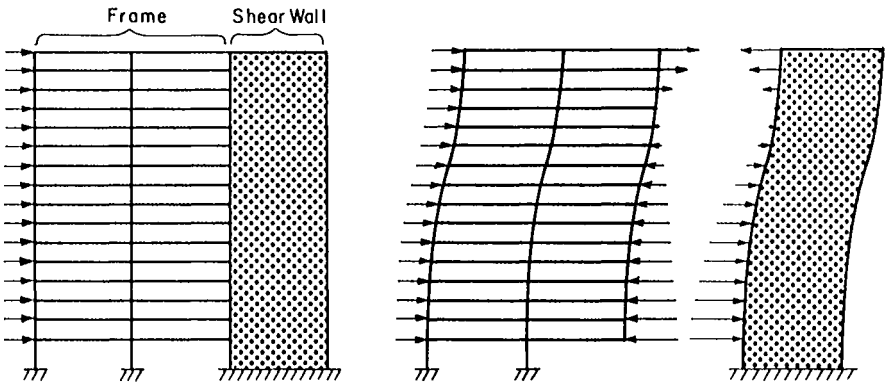

Fig. 1. Interaction between frame and shear wall

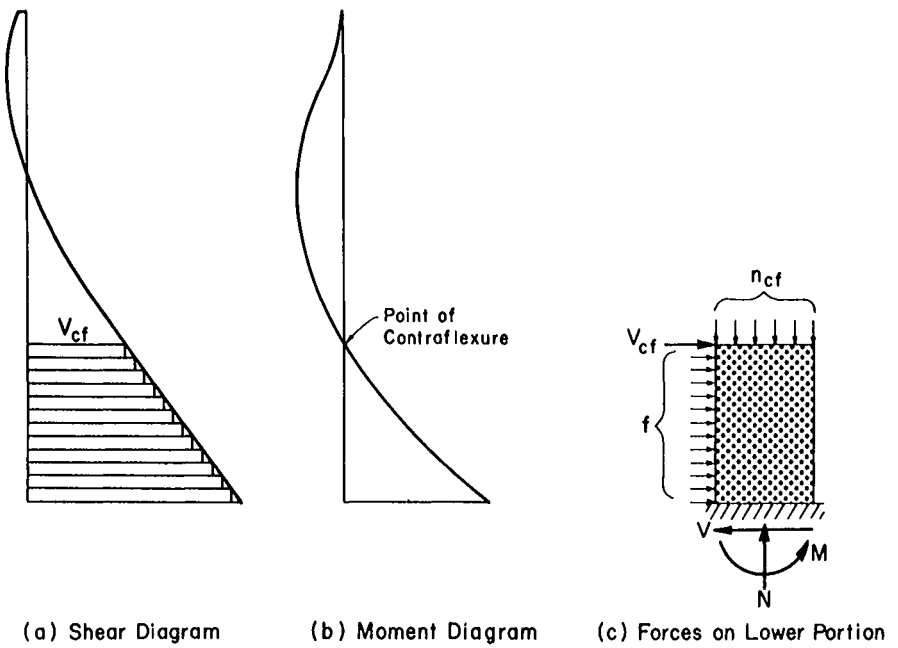

Fig. 2. Forces acting on a high-rise shear wall

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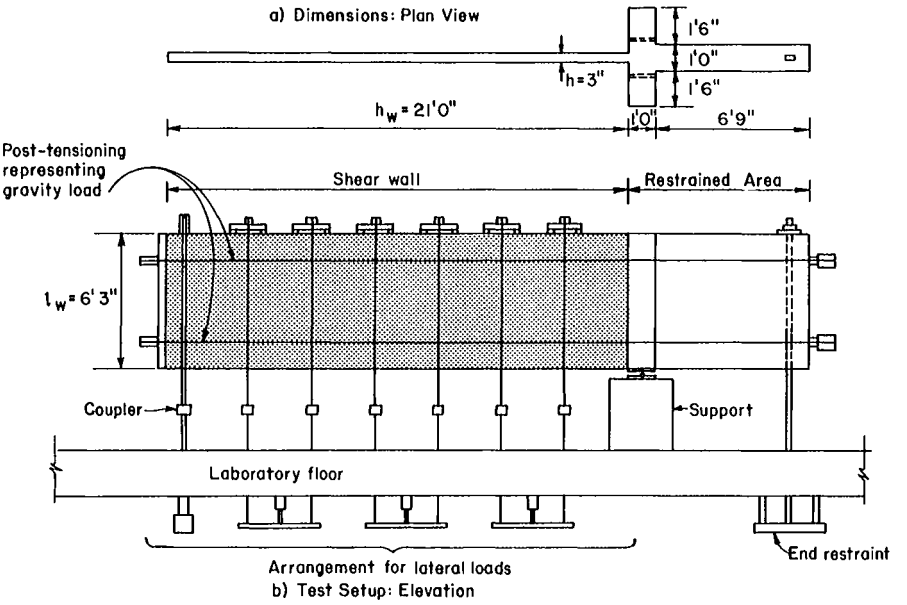

Fig. 3. Shear wall specimen: dimensions and test setup

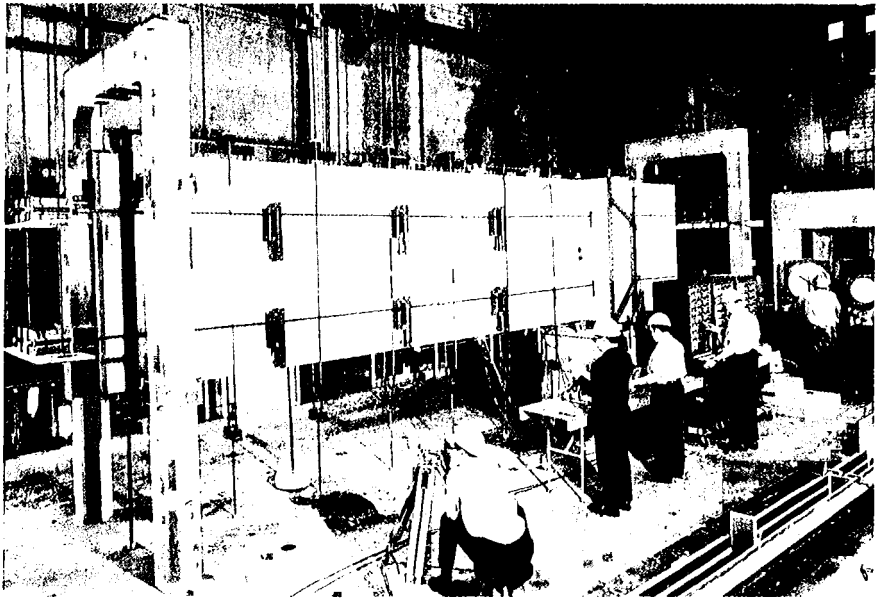

Fig. 4. Test setup for shear wall investigation

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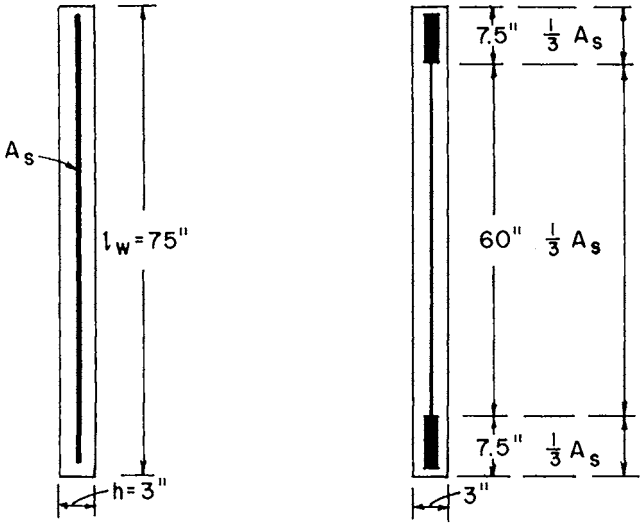

Fig. 5. Distribution of vertical reinforcement in test specimens

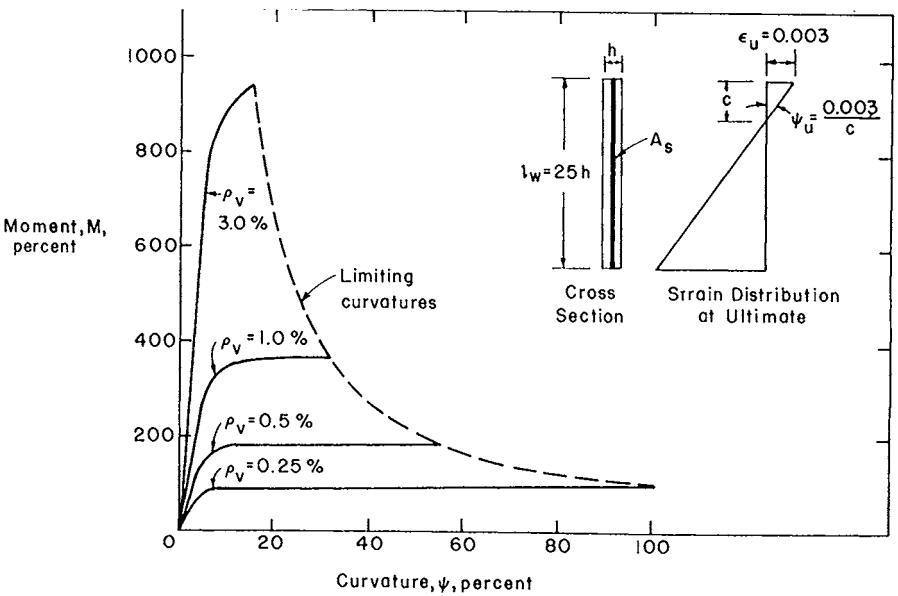

Fig. 6. Moment-curvature relationships for rectangular shear walls

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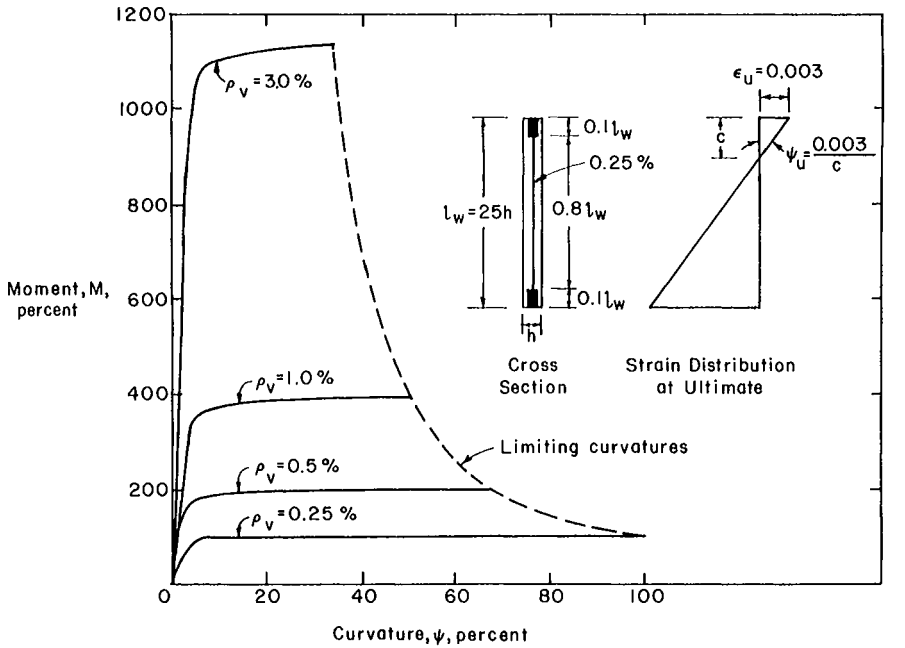

Fig. 7. Effect of reinforcement distribution on moment-curvature

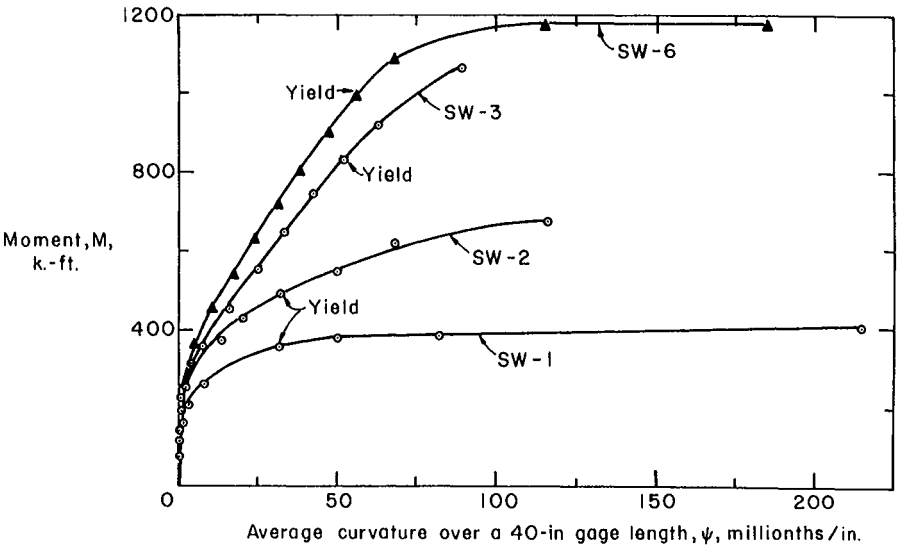

Fig. 8. Measured moment-curvature relationships

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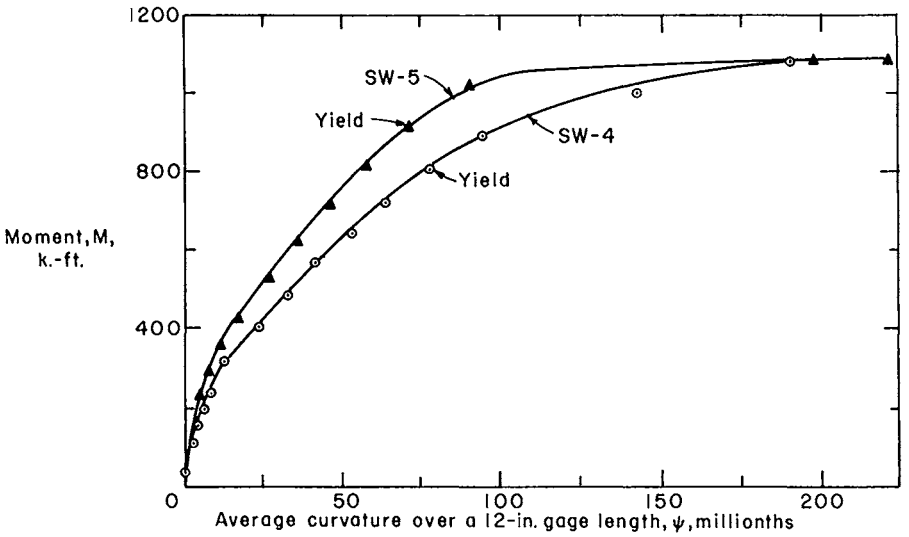

Fig. 9. Measured moment-curvature relationships

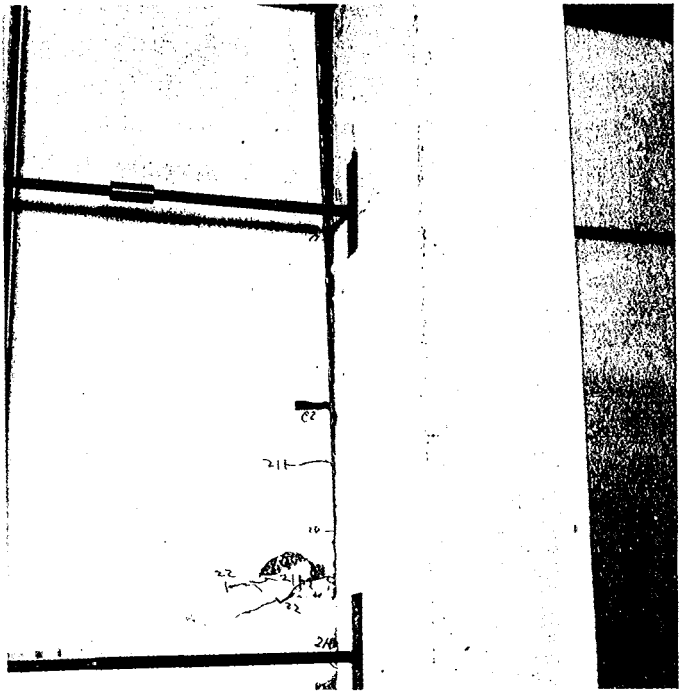

Fig. 10. Failure by fracture of the reinforcement

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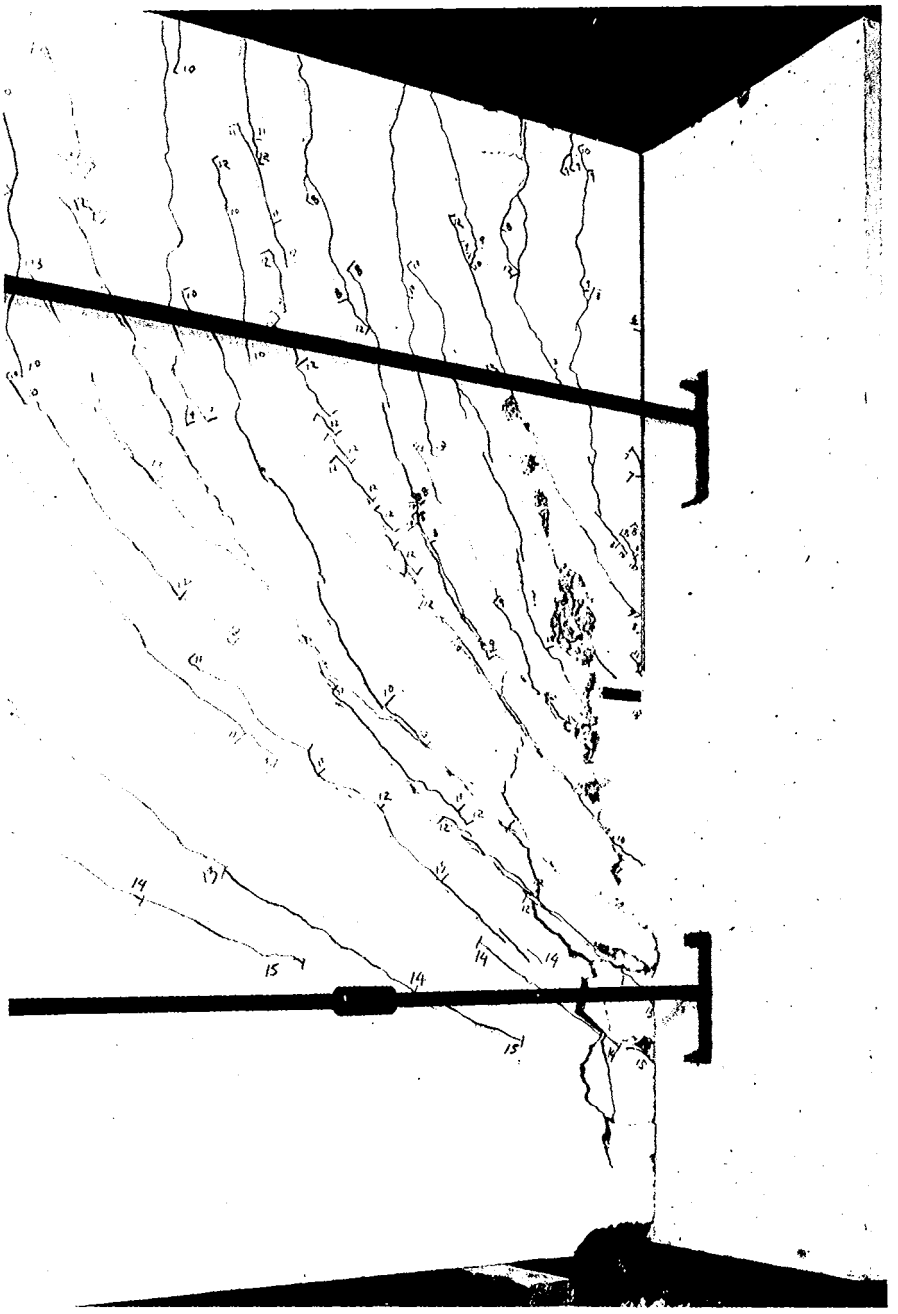

Fig. 11. Failure by crushing of the concrete

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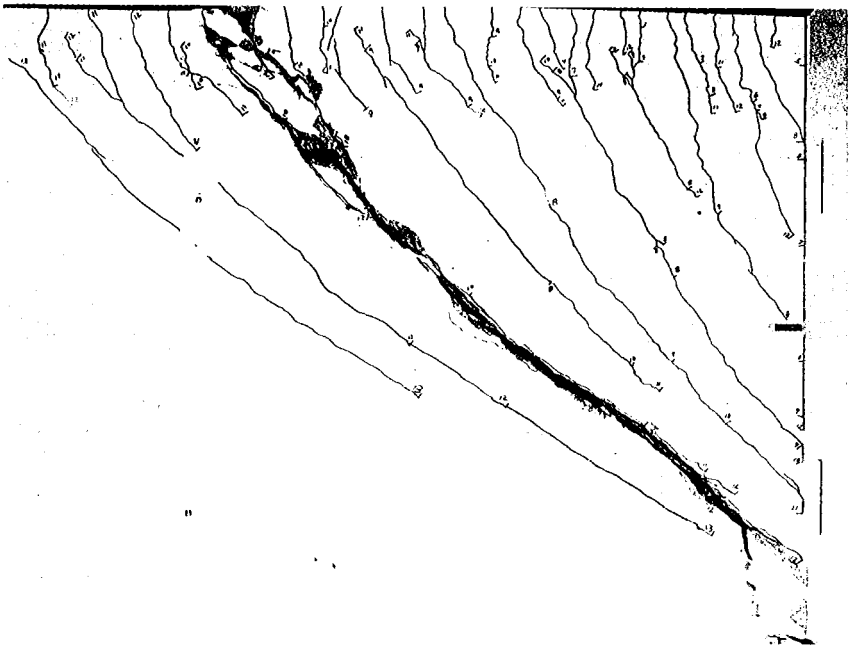

Fig. 12. Flexure-shear failure

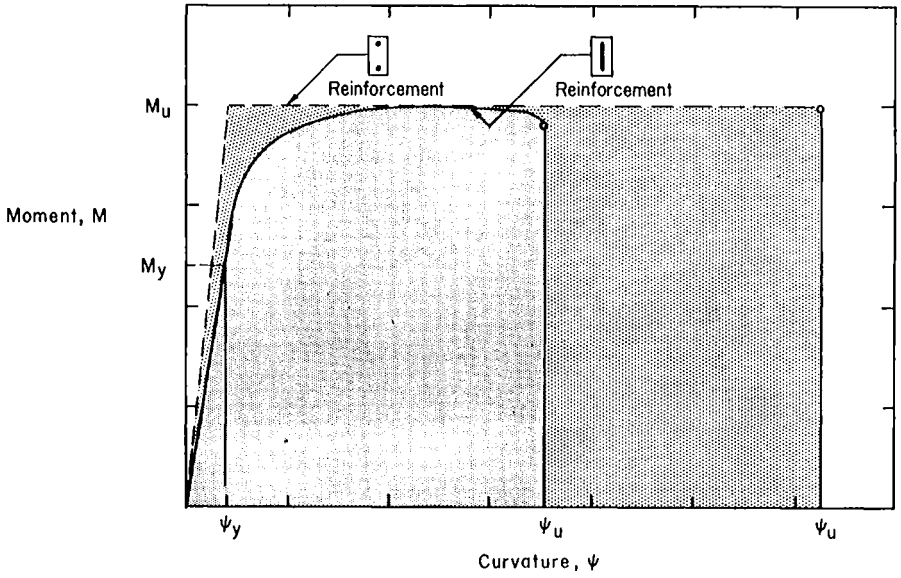

Fig. 13. Energy absorption of shear walls

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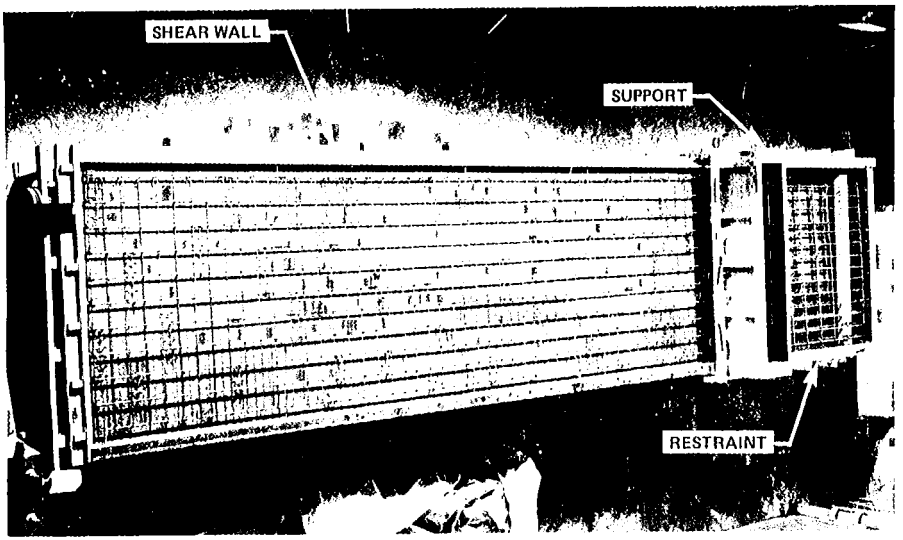

Fig. A1. Shear wall before casting

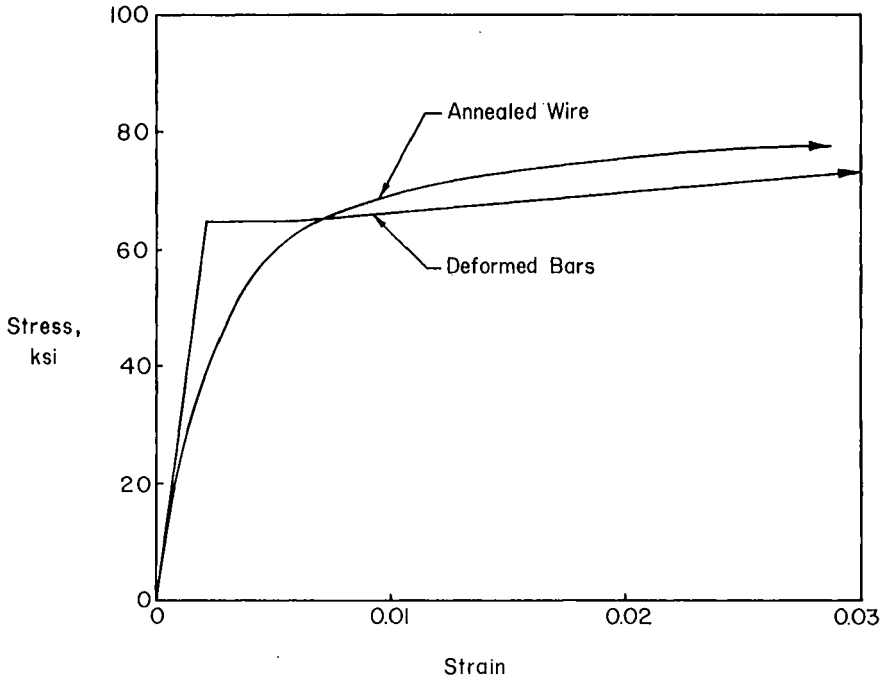

Fig. A2. Reinforcement stress-strain relationships

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