

Chapter 17

References And Annotated Bibliography

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201.2R	Guide to Durable Concrete
211.1	Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
211.2	Standard Practice for Selecting Proportions for Structural Lightweight Concrete”.
212.1R	Admixtures in Concrete
212.2R	Guide for Use of Admixtures in Concrete
213R	Guide for Structural Lightweight Aggregate Concrete
2143.R	Simplified Version of the Recommended Practice for Evaluation of Strength Results of Concrete
226.1R	Ground Granulated Blast-Furnace Slag as a Cementitious Constituent in Concrete

226.3R	Use of Fly Ash in Concrete
301	Standard Specifications for Structural Concrete
302.1R	Guide for Concrete Floor and Slab Construction
318/318R	Building Code Requirements for Structural Concrete and Commentary
345	Standard Practice for Concrete Highway Bridge Deck Construction
357.1R	State-of-the-Art Report on High Strength Concrete

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C 29/C 29M	Standard Test Method for Bulk Density (Unit Weight) and Voids in Aggregate
C 31	Standard Practice for Making and Curing Concrete Test Specimens in the Field
C 33	Standard Specification for Concrete Aggregates
C 70	Standard Test Method for Surface Moisture in Fine Aggregate
C 94	Standard Specification for Ready-Mixed Concrete
C 127	Standard Test Method for Density, Relative Density (Specific Gravity) and Absorption of Coarse Aggregate
C 128	Standard Test Method for Density, Relative Density (Specific Gravity) and Absorption of Fine Aggregate
C 131	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
C 136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregate
C 138	Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
C 143	Standard Test Method for Slump of Hydraulic Cement Concrete
C 150	Standard Specification for Portland Cement
C 172	Standard Practice of Sampling Freshly Mixed Concrete
C 173	Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
C 177	Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded Hot Plate Apparatus
C 188	Standard Test Method for Density of Hydraulic Cement
C 192	Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory
C 236	Standard Test Method for Steady-State Thermal Performance of Building Assemblies by Means of a Guarded Hot Box
C 260	Standard Specification for Air-Entraining Admixtures for Concrete
C294	Standard Descriptive Nomenclature for Constituents of Concrete Aggregates, section 26.3.5.
C 330	Standard Specification for Lightweight Aggregates for Structural Concrete
C 331	Standard Specification for Lightweight Aggregates for Structural Concrete
C 332	Standard Specification for Lightweight Aggregates for Insulating Concrete

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C 469	Standard Test Method for Static Modulus of Elasticity and Poisson's Ratio of Concrete in Compression
C 494	Standard Specification for Chemical Admixtures for Concrete
C 496	Standard Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens
C 512	Standard Test Method for Creep of Concrete in Compression
C 566	Standard Test Method for Total Evaporable Moisture Content of Aggregate by Drying
C 567	Standard Test Method for Determining Density of Structural Lightweight Concrete
C 618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
C 666	Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing (Procedure A).
C 976	Test Method for Thermal Performance of Building Assemblies by Means of a Calibrated Hot Box".
C 989	Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars
C 1202	Standard Test Method for Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration
D 698-00a	Standard Test Methods For Laboratory Compaction Characteristics of Soil Using Standard Effort", pp. C9 – C19
D 4253-00	Standard Test Methods For Maximum Index Density and Unit Weight of Soils Using a Vibratory Table", pp. C20 – C33
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E 119	Standard Test Method for Fire Tests of Building Construction and Materials
E 1677-00	Standard Specification for Air Retarder (AR) Material on System for Low-Rise Framed Building System
E 2178	Standard Test Method for Air Permeance of Building Materials
G 57	Standard Test Method for Field Measurement of Soil Resistivity Using the Wenner Four-Electrode Method

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TEK 10-1A	Crack Control in Concrete Masonry Walls
TEK 10-2B	Movement (Control) Joints for Concrete Masonry Walls-Empirical Method
TEK 10-3	Control Joints for Concrete Masonry Walls-Alternative Engineered Method
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Annotated Bibliography (As of 17 January 2002)

#	Author(s)	Title	Source	Date	Page(s)	Notes
1	Raithby Lydon	Lightweight Concrete in Highway Bridges	The International Journal of Cement Composites and Lightweight Concrete	May, 1981	133-146	The article provides an overview of lightweight concrete used in highway bridges in North America, Russia, West Germany, Holland, Belgium and Great Britain. (GI, PR)
2		Stalite Website	www.stalite.com	Feb, 2000		The Website provides product descriptions to include reasons for use of lightweight aggregate. (GI, PR, MP)
3	Mazanti	A Study of Lightweight Aggregate Concrete for Prestressed Highway Bridge Girders-Phase III	GA Tech Library	Mar, 1968		Describes research project outcome based on use of lower strength LWC mixes. Complete report is in the library in the stacks. (GI, MP, CS, PR) (f_c': 4,000-5,000 psi)
4	Jacques	Study of Long Span Prestressed Concrete Bridge Girders	PCI Journal	Mar-Apr, 1971	24-42	The article provides the results of an extensive computer analysis study of bridge girder types and describes the development of a new Colorado standard. Interesting cost information is provided. (GI, CI, PR) (f_c': 5,000-7,000 psi)
5	Branison Kripanarayanan	Loss of Prestress, Camber and Deflection of Non-composite and Composite Prestressed Concrete Structures	PCI Journal	Sep-Oct, 1971	22-52	This article is an excellent source. It provides general equations for predicting loss of prestress for both composite and non-composite structures. Provided excellent comparisons between NWC and LWC with regard to creep and shrinkage and other properties. Included work from several universities. (CS, MP, PR) (f_c': 6,000-6,800 psi)
6	Bender	Economics and Use of Lightweight Concrete in Prestressed Structures	PCI Journal	Nov-Dec, 1980	62-67	This article provides an evaluation of the use of LWC for a segmental prestressed concrete bridge. The author does not mention concrete strengths. His conclusion is that there is an economic advantage to using LWC in precast structures. (GI, CI, PR)
7	Lutz Scalia	Deck Widening and Replacement of Woodrow Wilson Memorial Bridge	PCI Journal	May-Jun, 1984	74-94	This article discusses the use of LWC made with Carolina Stalite to cast replacement deck panels for use on the WWMB. The use of LWC enabled the installation of an additional lane of traffic greatly improving traffic flow. (GI, CI) (f_c': 5,000 psi)
8	Berner Polivka Gerwick Pirtz	Behavior of Prestressed Lightweight Concrete Subjected to High-Intensity Cyclic Stress at Cryogenic Temperatures	ACI Journal	Sep-Oct, 1986	727-736	This article was only vaguely related. It discussed the use of LWC for cryogenic containment vessels (LPG Ships, etc). While addressing material and thermal properties, and the aspect of prestressing, it provided little applicable information. (GI, MP, PR)
9	Popovic Anderson	Load Testing of Long Span Prestressed Single Tee Beams	PCI Journal	Mar-Apr, 1988	42-51	This paper addresses the field-testing of two long span prestressed single tee beams produced from SLWC. The tests showed that the beams satisfactorily carried the load and were a viable alternative. (GI, CI, PR, FB) (f_c': 6,000 psi)
10	Neville	Aggregate Bond and Modulus of Elasticity of Concrete	ACI Materials Journal	Jan-Feb, 1997	71-74	This article discusses the relatively small difference between LWA modulus and the cement paste modulus and the affect on bond strength. Concrete strengths not listed. (B, MP)
11	Smadi Migdaddy	Properties of High Strength Tuff Lightweight Aggregate Concrete	Cement and Concrete Composites	1991	129-135	This article is very specific in nature in that it addresses only one type of LWA found in Northeast Jordan. It addressed splitting tensile strength, modulus of rupture, E, and Poisson's ratio. (MP) (f_c': 4,000-8,000 psi)

NOTE: THIS ANNOTATED BIBLIOGRAPHY WAS PRESENTED BY CDT. E. STIFFEX AT ACI MTG FALL 2005 UNDER DIRECTION OF LTC K.F. MEYER, PROF. U.S. MILITARY ACADEMY WEST POINT NY

#	Author(s)	Title	Source	Date	Page(s)	Notes
12	Ahmad Barker	Flexural Behavior of Reinforced High-strength Lightweight Concrete Beams	ACI Structural Journal	Jan-Feb, 1991	69-77	The most important part of this article is to verify the validity of the RSB for use with HSLWC up to 11,000 psi strength. Also discussed is the validity of 0.003 as the value for ultimate strain. (FB) (f_c': 11,000 psi)
13	Ahmad Batta	Flexural Behavior of Doubly Reinforced High-strength Lightweight Concrete Beams with Web Reinforcement	ACI Structural Journal	May-Jun, 1991	351-358	This article addresses the strength and ductility of reinforced HSLWC. The applicability of the RSB and 0.003 for the ultimate strain are discussed. (FB) (f_c': 11,000 psi)
14	Ahmad Xie Yu	Shear Strength of Reinforced Lightweight Concrete Beams of Normal and High-Strength Concrete	Magazine of Concrete Research	March, 1994	57-66	This article covered an experimental investigation of the ultimate shear strength and load-deformation characteristics of shear critical reinforced lightweight concrete of normal and high strength. The article addresses the ACI recommended reduction factor of 0.85 for LWC shear calculations. (SH) (f_c': 4,400-12,950 psi)
15	Burg Cichanski Hoff	Selected Properties of Three High-strength Lightweight Concretes Developed for Arctic Offshore Structures	Proceedings of the 9 th Intl. Conference on Offshore Mechanics and Arctic Engrg.	Feb, 1990	85-92	This paper provided only limited information on the subject. (GI, MP) (f_c': 7,000-9,000 psi)
16	Tachibana Imai Okada	Qualities of High-Strength Lightweight Concrete used for Construction of Offshore Platform	Journal of Offshore Mechanics and Arctic Engineering	Feb, 1990	27-34	This paper provided only limited information on the subject. (GI, MP) (f_c': 6,000-7,000 psi)
17	Vaysburg	Durability of Lightweight Concrete Bridges in Severe Environments	Concrete International	July, 1996	33-38	This article addresses some related and very interesting aspects of LWC. In the area of the contact zone, LWC behaves with less cracking due to a better compatibility between the aggregate and cement paste. This is useful information when examining bond. (MP, GI, B)
18	Murillo Thoman Smith	Lightweight Concrete for a Segmental Bridge	Civil Engineering	May, 1994	68-70	This is a very non-technical article designed to provide some of the basic benefits associated with the use of LWC. Seismic benefits are discussed. (GI, CI, PR)
19	Curcio Galeota Gallo Giammatteo	High-Performance LWC for the Precast Prestressed Concrete Industry	ACI SP 179-24	Jun, 1998	389-405	This article provides useful information on numerous properties of LWC, but does not draw any solid ties with its use on precast, prestressed concrete. (MP, PR) (f_c': 9,000 psi)
20	Yeginobali, Sobolev, Soboleva Tokyay	High Strength Natural Lightweight Aggregate Concrete with Silica Fume	ACI SP 178-38	May, 1998	739-758	This article addresses a particular type of aggregate (pumice) found in Turkey. The use of silica fume significantly improved several material properties to include compressive strength, splitting tensile strength and modulus of elasticity. (MP, B) (f_c': 2,500-8,000 psi)
21	Kong Teng Singh Tan	Effect of Embedment Length of Tension Reinf. on the Behavior of LWC Deep Beams	ACI Structural Journal	Jan-Feb, 1996	21-29	The focus of this article is deep beams. However, there is some information on shear that is useful. (SH) (f_c': 4,750 psi)

#	Author(s)	Title	Source	Date	Page(s)	Notes
22	Mor	Steel-Concrete Bond in HSLWC	ACI Materials Journal	Jan-Feb, 1992	76-82	This article describes how the steel concrete bond can be doubled in HSLWC through the use of condensed silica fume. He concludes that E is not an effect of concrete strength alone. Compatibility between LWA and the cement paste contributes to a significantly better bond in LWC due to minimized microcracking. Thus, a better E also. (B, MP) (f_c': 10,000 psi)
23	Al-Khaiat Haque	Effect of Initial Curing on Early Strength and Physical Properties of a Lightweight Concrete	Cement and Concrete Research	1998	859-866	This article addresses HSLWC made using Lytag LWA. The authors performed several tests to determine material properties to include compressive strength, modulus of rupture, modulus of elasticity, indirect tensile strength, permeability, and drying shrinkage. It is fairly limited in scope. (MP, CS)
24	Yang	Approximate Elastic Moduli of Lightweight Aggregate	Cement and Concrete Research	1997	1021-1030	This article focuses on the determination of the modulus of LWA and its impact on the modulus of LWC. Various proportions of aggregate and mix designs were tested. (MP)
25	Melby Jordet Hansvold	Long-span Bridges in Norway Constructed in High-strength LWA Concrete	Engineering Structures	1996	845-849	This article discusses the use of LWC for the structure and deck of the Sandhornoya and Stovset Bridges in Norway. The LWA used is Liapor 8, manufactured in Germany. The paper provides general information concerning the results of LWC usage and testing. Conclusions include: (1) LWC is generally economical for long-span bridges (2) An intensive inspection program will take place in a few years—results should be made available. (GI, PR, CI) (f_c': 8,500-11,000 psi)
26	Nilsen Montiero Gjorv	Estimation of the Elastic Moduli of Lightweight Aggregate	Cement and Concrete Research	1995	276-280	This article provides a technique for estimating the elastic modulus of LWA. It could have some applicability for examining LWA types and their use in bridge girders. (MP)
27	Birjandi Clark	Deflection of Lightweight Aggregate Concrete Beams	Magazine of Concrete Research	1993	43-49	This article addresses the deflection of beams constructed with LWC over a period of 6 months. The LWA types were Lytag (Sintered PFA) and Leca (Expanded clay), both produced in Great Britain. The focus of this article was to evaluate the accuracy of the British Standard Code for applicability to LWC. (MP, FB, CS) (f_c': 5,000-6,000 psi)
28	Clark Birjandi	Bond Strength Tests for Ribbed Bars in Lightweight Aggregate Concrete	Magazine of Concrete Research	1993	79-87	This article examines bond strength LWC made from Lytag (Sintered PFA), Pellite (pelletized BFS), Leca (Expanded Clay) and Fibo (Expanded clay). Three methods for determining bond strength were considered. Bond strength of LWC is lower than that of NWC. (B) (f_c': 3,000-10,000 psi)
29	Mircea Ioani Filip Pepenar	Long-term Durability of Reinforced and Prestressed Elements in Aggressive Environments	ACI Materials Journal	Mar-Apr, 1994	135-140	This article focused on durability issues of LWC and NWC over a period of 10-12 years. Prestressed members were also examined in the study. The article is not of any real use. (GI)
30	Roller Russell	Shear Strength of High-strength Concrete Beams with Web Reinforcement	ACI Structural Journal	Mar-Apr, 1990	191-198	This article focuses on shear strength of HSNWC beams with web reinforcement. It does not deal with LWC. The information on shear provided is excellent background information for HSC shear behavior and may be applicable for HSLWC. (SH)
31	Kohno Okamoto Isikawa Sibata Mori	Effects of Artificial Lightweight Aggregate on Autogenous shrinkage of Concrete	Cement and Concrete Research	1999	611-614	This article examines factors that effect autogenous shrinkage of concrete. The inclusion of LWA in concrete mixes has been shown to replace moisture used in self-desiccation. (MP, CS)

#	Author(s)	Title	Source	Date	Page(s)	Notes
32	Shideler	Lightweight Concrete for Structural Use	Journal of the American Concrete Institute	Oct, 1957	299-328	This excellent article addressed 8 different LWAs and is a superb source of some of the initial work done with LWC. Creep is addressed thoroughly as is the requirement for manufacturers to individually provide data on material specifications and performance. The key point reference the size effect of members and the impact on creep is made. (CS, MP, GI, PR) (f_c': 10,000 psi)
33	Salandra Ahmad	Shear Capacity of Reinforced Lightweight High-strength Concrete Beams	ACI Structural Journal	Nov-Dec, 1991	697-704	This article reports the results of a testing program that included the construction of 16 beams. The LWA was expanded slate. The test results indicated that for beams with certain a/d and steel ratios that the ACI code provisions were unconservative for concrete strengths above 10,000 psi. (SH) (f_c': 7,800-10,500 psi)
34	Holm Bremner	State-of-the-Art Report on High-Strength, High-Durability Structural Low-Density Concrete for Applications in Severe Marine Environments	US Army Corps of Engineers Engineer Research and Development Center	Jan, 2000 (Draft)	96 pages	This report prepared by two of the pioneers in the area of LWC is a thorough collection of information related to LWC. It provides historical background, material properties engineering properties, durability discussion, constructability considerations, applications, and economic considerations. There is not significant information on prestress applications. The report does not go into detail on shear, flexure, bond or creep and shrinkage. It is more general in nature. (GI, CI, B, CS, FB, SB, DL, MP, PR)
35	Leming	Creep and Shrinkage of Lightweight Concrete	North Carolina State University Publication	1990	4 pages	This report was published in concert with Carolina Stalite Company. It reports that LWC produced with Carolina Stalite have superior performance based on the greater stiffness of the LWA. (CS, MP)
36	Fujii Adachi Takeuchi Kakizaki Edahiro Inoue Yamamoto	Properties of High-Strength and High-Fluidity Lightweight Concrete	ACI SP 179-5	Jun, 1998	65-83	This article examines the use of silica fume blended cement with LWA. There is some useful information related to material properties and water/cement ratios. (MP) (f_c': 5,500-8,500 psi)
37	Fujii Kakizaki Edahiro Unisuga Yamamoto	Mixture Proportions of High-strength and High-fluidity Lightweight Concrete	ACI SP 179-25	Jun, 1998	407-420	This article is a continuation of the work mentioned in reference # 36 above, but addresses the mixture proportioning done in the study. (MP)
38	Sobolev Soboleva	High-performance Concrete Mixture Proportioning	ACI SP 179-26	Jun, 1998	421-438	This article provides the results of an investigation on the effects of silica fume based superplasticized high-performance concrete. A mathematical model was used to determine the results. (MP)
39	Roberts	Lightweight Concrete Bridges for the California Highway System	ACI SP 136-5	1992	253-271	This article describes the use of expanded shale lightweight concrete for older bridge widenings and new bridge construction. Examples of durability and reliability are provided. (GI, CI, PR)
40	Berner	High Ductility, High Strength Lightweight Aggregate Concrete	ACI SP 136-8	1992	319-343	This paper addresses the behavior of highly confined HSLWC. Discussion of ultimate strain, deflection and ductility. (FB, MP) (f_c': 8,000-9,000 psi)
41	ASTM	Standard Specification for Lightweight Aggregates for Structural Concrete	ASTM C330-99	1999	4 pages	

#	Author(s)	Title	Source	Date	Page(s)	Notes
42	ASTM	Standard Test Method for Static Modulus of Elasticity and Poisson's Ratio of Concrete in Compression	ASTM C469-94	1994	4 pages	
43	ASTM	Standard Test Method for Creep in Concrete in Compression	ASTM C512-87	1992	3 pages	
44	Carolina Stalite	Information from Carolina Stalite Company, Salisbury, NC	Carolina Stalite Company	2000		Various product literature and test results provided by Carolina Stalite. An overview of LWC used in noteworthy bridges, and other product information is included. (GI, MP, CI)
45	Harmon	Physical Characteristics of Rotary Kiln Expanded Slate Lightweight Aggregate	Carolina Stalite Company (Paper presented at conference in Norway)	Jun, 2000	11 pages	The paper discusses the physical characteristics of rotary kiln expanded slate lightweight aggregate for producing high performance high strength lightweight concrete. (MP, GI)
46	Bremner Holm	Elastic Compatibility and the Behavior of Concrete	ACI Journal	Mar-Apr, 1986	244-250	This paper provides excellent coverage of the elastic mismatch encountered in concrete. The use of lightweight aggregate serves to reduce this elastic mismatch that reduces microcracking, thus reducing permeability and impacting modulus of elasticity. The article also provides some excellent methods and suggestions for overcoming the elastic mismatch problem. (MP)
47	Pfeiffer	Sand Replacement in Structural Lightweight Concrete—Splitting Tensile Strength	ACI Journal	Jul, 1967	384-392	This article reports the results of splitting tensile strength testing of seven structural lightweight concretes. STS of equal strength LWC and NWC samples was the same provided the specimens were moist cured. The use of sand fines reduced the drop in STS experienced by the LWC when samples were dry cured. (MP) (f'_c : 3,000-5,000 psi)
48	Pfeiffer	Sand Replacement in Structural Lightweight Concrete—Creep and Shrinkage Studies	ACI Journal	Feb, 1968	131-139	This article dovetails with the article listed as #47 above. Using the same seven LWC mixes, the author found that the addition of sand fines generally reduced creep and shrinkage. (MP, CS) (f'_c : 3,000-5,000 psi)
49	Wang Shah Naaman	Stress-Strain Curves of Normal and Lightweight Concrete in Compression	ACI Journal	Nov, 1978	603-611	This article describes a technique for determining the stress-strain curves for NWC and LWC up to a strain of 0.006. An analytic expression is developed to report experimental results. The authors made a specific comment on the need to have specifications for each type of LWA. (MP) (f'_c : 3,000-8,000 psi)
50	Hanson	Tensile Strength and Diagonal Tension Resistance of Structural Lightweight Concrete	Journal of the American Concrete Institute	Jul, 1961	1-37	This article describes tests employed and the results obtained from testing LWC beams. The author found a good correlation between the "split cylinder" tension test and the shear resistance of beams without web reinforcement at diagonal cracking. The author specifically states that there is need to establish LWA specifications by manufacturer in order to accurately predict strengths. (SH, MP) (f'_c : 3,000-9,000 psi)
51	Pauw	Static Modulus of Elasticity of Concrete as Affected by Density	Journal of the American Concrete Institute	Dec, 1960	679-687	This article provides an excellent basis for the current equation used to determine the modulus of elasticity of concrete. Lightweight concrete is covered in this article. (MP) (f'_c : 6,500 psi)

#	Author(s)	Title	Source	Date	Page(s)	Notes
52	Kluge Sparks Tuma	Lightweight-Aggregate Concrete	Journal of the American Concrete Institute	Apr, 1949	625-644	This article discusses various types of LWA, but focuses only slightly on slate LWA. Concretes of various proportions were studied. Workability, shrinkage, and modulus of elasticity were discussed in detail. (MP, GI) (f_c': 7,000 psi)
53	Hsu Slate Sturman Winter	Microcracking of Plain Concrete and the Shape of the Stress-Strain Curve	Journal of the American Concrete Institute	Feb, 1963	209-223	This article has no mention of LWA, but provides a great background on the elastic mismatch between the mortar paste and aggregate in NWC. It provides a relation between microcracking and the shape of the stress-strain curve. A microscopic examination is done with red dye to look at crack patterns and formation. (GI, MP, B)
54	ESCSI	Building Bridges with Structural Lightweight Aggregate Concrete	Expanded Shale, Clay and Slate Institute Information Sheet # 470.4	Jun, 1994	16 pages	This publication provides detailed information on thirteen bridges constructed with LWC. It also provides excellent background information on LWC to include the benefits of using the material. (GI, PR) (f_c': 3,000-8,700 psi)
55	Bentz Snyder	Protected Paste Volume in Concrete: Extension to Internal Curing Using Saturated Lightweight Fine Aggregate	Cement and Concrete Research	1999	1863-1867	This article describes the use of fine LWA to facilitate "internal curing" and reduce autogenous shrinkage and self desiccation encountered with high-performance concrete. A 3-D concrete microstructural model was developed to determine the fraction of cement paste within a given distance from the lightweight aggregate surfaces. (GI, CS)
56	Holm Bremner	70 Year Performance Record for High-Strength Structural Lightweight Concrete	Serviceability & Durability of Construction Materials Proceedings of the First Materials Engineering Congress	Aug, 1990	884-893	This article addresses the elastic match found between LWA and the cement paste. At lower strengths, the match is very close. Also discussed are strength ceilings for LWC based on aggregate strength and the aggregate - cement paste bond. Calculation of the modulus of elasticity and internal curing are discussed in some detail. (MP, B, GI) (f_c': 1,000-10,500 psi)
57	Brown Larson Holm	Long-Term Service Performance of Lightweight Concrete Bridge Structures	International Symposium on Structural Lightweight Aggregate Concrete, Sandefjord, Norway	Jun, 1995	12 pages	This brochure discusses the long-term performance of the Suwanee River Bridge at Fanning Springs, Florida. The FDOT performed an extensive testing program to determine any changes in performance from the time of construction (1968) to present (1992). In short, the bridge was found to behave very similarly in 1992 when compared to the original test data. (GI, PR, CI) (f_c': 5,000 psi)
58	Bremner Holm Stepnova	Lightweight Concrete - A Proven Material for Two Millennia	Proceedings of Advances in Cement and Concrete, University of New Hampshire	1994	16 pages	This article provides a historical perspective with some information also about durability and corrosion. (GI)

#	Author(s)	Title	Source	Date	Page(s)	Notes
59	Fergestad Aas-Jakobsen	Bridges Built with Lightweight Concrete in Norway	Proceedings of International Symposium on Lightweight Concrete Bridges, Sponsored by CALTRANS	1996	22 pages	This article provides an overview of the construction of numerous bridges in Norway using LWC. There is very little technical information in this article. There is, however, information on concrete mixes and detail on construction techniques. There is no mention of the use of Stalite LWA. (GI, PR, MP) (f_c': 7,000-10,000 psi)
60	Holm Bremner	Chapter 10, High Strength Lightweight Aggregate Concrete	High Performance Concretes and Applications, ed. S.P. Shah and S.H. Ahmad, London.	1994	341-374	This chapter prepared by two of the pioneers in the area of LWC is a thorough collection of information related to LWC. It provides historical background, material properties engineering properties, durability discussion, constructability considerations, applications, and economic considerations. There is not significant information on prestress applications. The chapter does not go into detail on shear, flexure, bond or creep and shrinkage. It is more general in nature. (GI, CI, B, CS, FB, SB, DL, MP, PR) (f_c': 7,000-10,000 psi)
61	Bilodeau Chevri�r Malhotra Hoff	Mechanical Properties, Durability and Fire Resistance of High- Strength Lightweight Concrete	International Symposium on Structural Lightweight Aggregate Concrete, Sandefjord, Norway	Jun, 1995	432-443	This article covers tensile strength, modulus of elasticity, autogenous temperature rise and drying shrinkage in some detail. (MP, CS, GI) (f_c': 8,000-9,000 psi)
62	PCA Article	Planning, Design, and Construction of the Wisconsin Avenue Viaduct	Engineered Concrete Structures (PCA)	Dec, 1993	4 pages	This brochure provides excellent information on bulb-tees, but only makes one comment about LWC. (GI, PR, CI) (f_c': 6,000-7,000 psi)
63	ACI Committee 211	Standard Practice for Selecting Proportions for Structural Lightweight Concrete (ACI 211.2-91)	1996 ACI Manual of Common Practice	1996	211.2-1 to 211.2-14	This section of the Manual for Standard Practice provides detailed procedures for correctly proportioning LWC. (MP, GI) (f_c': 6,000 psi)
64	FIP Committee	Chapter 7, Design of Prestressed Lightweight Concrete Structures	Federation Internationale de la Precontrainte (FIP) Manual of Lightweight Aggregate Concrete, 2 nd Edition	1983	168-206	This chapter addresses the design of prestressed LWC structures. It specifically addresses rupture strength, Solite LWA, shear reinforcement requirements, deflections, shrinkage, and other useful information. In many cases, the coverage of each topic is very light, but offers the most current information as of date of publication. Two comprehensive design examples are provided to cover different types of prestressed structures. One must keep in mind that European specifications often use "cube" based strengths vs. our "cylinder" based strengths. (MP, SH, PR, FB, CS, DL) (f_c': 7,500 psi)
65	Clark Pankhurst Manhoudt	Chapters 3, 6 and 7	Structural Lightweight Aggregate Concrete, ed. John L. Clark, Blackie Press	1993	66-75 150-167	John L. Clark, an authority in LWC in Britain, edits this book. It provides a collection of reference data for LWC. In many cases, the authors list various specifications in existence addressing particular aspects of LWC design. In some cases, they have made their own recommendations based on the literature. (MP, SH, PR, FB, CS, DL)

#	Author(s)	Title	Source	Date	Page(s)	Notes
66	Short Kinniburgh	Lightweight Concrete	Lightweight Concrete, CR Books, Ltd. London	1968	4-5 192-196	This book offered a few pages of information specifically applying to prestressed LWC. It contains specific information applicable to bond strength and creep and shrinkage. Also, the author comments on the need for manufacturer specific specifications to avoid penalizing certain LWA types. (B, CS, GI)
67	ASTM	List of Applicable ASTM Specifications for ACI 318	Consolidation of ASTM Specifications for ACI 318 TA440.A85	1980	Various	This publication provided a concise listing of all applicable ASTM specifications for ACI 318. While dated, it still provides a valid listing that is a good reference.
68	PCA Article	Shelby Creek Bridge	Engineered Concrete Structures (PCA)	Aug, 1992	4 pages	This brochure provides basic information about the Shelby Creek Bridge in Pike County, KY. It provides only basic info describing the use of LWC. (GI, PR, CI) (f_c': 7,000 psi)
69	Brown Davis	A Load Response Investigation of Long Term Performance of a Prestressed Lightweight Concrete Bridge at Fanning Springs, FL	FL/DOT/SMO- 93-401 Report from FL DOT	Apr, 1993	66 pages	This comprehensive report describes the testing of a 28 year old bridge (refer to #57) in Fanning Springs, FL. The report describes the in-depth testing procedures and discusses deflections, Solite LWA, modulus of elasticity values, and other pertinent information. The results of testing indicated excellent performance after 28 years of use. (GI, CI, MP, PR) (f_c': 6,500 psi)
70	Valum Nilsskog	Production and Quality Control of High Performance Lightweight Concrete for the Raftsundet Bridge	Fifth International Symposium on Utilization of High Strength / High Performance Concrete, Sandefjord, Norway	June, 1999	909-918	This article addresses the challenges associated with quality control of LWC during the construction of the Raftsundet Bridge in Norway. Specifically addressed are the issues of absorption, pumping, air content and slump. A peculiar note is that there were no Norwegian specifications in place (other than draft ones) at the time of construction. (MP, GI, CI, PR) (f_c': 8,500 psi)
71	Leming	Properties of High Strength Concrete – An Investigation of High Strength Concrete Characteristics using Materials in North Carolina	North Carolina State University report for NCDOT and FHWA 23241-86-3	1988	186 pages	This report provides limited information on LWC. It addresses “internal curing” that results with the use of LWA. It also addresses creep, shrinkage and moisture content. The author makes specific mention of the dramatic affect that silica fume has on the strength of LWC. His conclusion was that it should be included in all mixes using LWA. He discusses the ability of the cement gel to grow into the aggregate resulting in an improved bond. (GI, CS, B, MP) (f_c': 6,900 – 12,300 psi)
72	Hoff	High Strength Lightweight Aggregate Concrete for Arctic Applications – Part I	ACI SP 136-1	1992	1-65	This article (1 of a 3 part series) describes a lengthy testing program to determine optimum concrete mixes for offshore oil drilling platforms. Specifically addressed are batching, pumping, air content, aggregate selection and absorption. The author discusses pressurizing aggregate and subjecting it to vacuum to determine absorption rates. (GI, MP) (f_c': 8,000-11,000 psi)
73	Hoff	High Strength Lightweight Aggregate Concrete for Arctic Applications – Part II	ACI SP 136-2	1992	66-173	This article (2 of a 3 part series) specifically addressed creep, shrinkage, modulus of rupture, splitting tensile strength, and the calculation of the modulus of elasticity. An interesting note is that the design strengths for their mixes were 7,000-9,000 psi; the resulting strengths are as noted—a significant increase. (CS, MP) (f_c': 8,000-11,000 psi)

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74	Hoff	High Strength Lightweight Aggregate Concrete for Arctic Applications – Part III	ACI SP 136-3	1992	175-245	This article (3 of a 3 part series) specifically addressed prestressed concrete, shear and flexural behavior with extensive work on the RSB, bearing and development length. Of the three articles, this is the most applicable one for our research. (FB, DL, B, SH, PR) (f'_c: 8,000-11,000 psi)
75	Ghosh Narielwala Shin Moreno	Flexural Behavior Including Ductility of High Strength Lightweight Concrete Member under Reversed Cyclic Loading	ACI SP 136-10	1992	357-376	This article describes a testing program focused on gathering information on the flexural properties, including ductility, of high-strength lightweight concrete members under reverse cyclic loading. (FB, SH, PR, GI) (f'_c: 5,000-9,000 psi)
76	Bremner Newman	Microstructure of Low Density Concrete Aggregate	Proceedings of the Ninth Congress of the Federation Internationale de la Precontrainte	Jun, 1982	24-31	This paper discusses only aggregates that are produced without crushing after heating. Thus, Stalite is not included in the study. The study found that a dense layer exists on about the outer 1mm of each LWA particle—this is common to each manufacturer. In spite of different raw materials used and different manufacturing processes, the internal microstructure of each product is very similar. (GI, MP)
77	Heffington	Development of High Performance Lightweight Concrete Mixes for Prestressed Bridge Girders	Master's Thesis, University of Texas at Austin	May, 2000	153	This thesis provides an excellent overview of the development of mix designs for use in high-strength lightweight concrete prestressed bridge girders. The mixes use LWA from Texas Industries (TXi) to include Clodine, Streetman and Colorado LWA. (CS, GI, MP, PR) (f'_c: 6,000-8,000 psi)
78	Thatcher	Behavior of Standard AASHTO Type I Pretensioned High Performance Lightweight Concrete Beams with Fully Bonded ½-Inch Prestressing Strand	Master's Thesis, University of Texas at Austin	Dec, 2000	132	This thesis provides coverage of the use of the mix designs developed in Article 78 above in AASHTO Type I girders. Excellent coverage is provided on development length and the use of prestressed lightweight concrete deck panels. Additional information is included on cracking and ultimate moment, strand elongation, maximum strain and displacement and failure types. (DL, FB, GI, MP, SH, PR) (f'_c: 6,000-8,000 psi)
79	Peterman Ramirez Olek	Design of Semilightweight Bridge Girders	Transportation Research Record 1696, Paper No. 5B0063	1999	41-47	This paper addresses development length considerations in both single and multi strand prestressed lightweight beams. Recommendations are made for adjusting the AASHTO Bridge Design Code development length equation to prevent bond failures. Strand sizes examined include 0.5" (regular and special) and 0.6" (B, DL, FB, SH, PR) (f'_c: 7,000-10,000 psi)
80	Holm Ries	Specified Density Concrete-A Transition for the Concrete Industry Publication # 4248.0	Expanded Clay, Shale and Slate Institute Publication 4248.0	2000	10	This ESCSI Publication addresses the topic of specified density concrete—designing for a specified unit weight. Covered are the areas of structural efficiency, marine structures, transportation costs, internal curing, maximum strength ceiling, and post-elastic strain capacity. (CL, GI, MP, PR) (f'_c: 3,000 -11,000 psi)
81	Kolozs	Transfer and Development Lengths of Fully Bonded ½-Inch Prestressing Strand in Standard I-Shaped Pretensioned High Performance Lightweight Concrete (HPLC) Beams	Master's Thesis, University of Texas at Austin	May, 2000	155	This report provides extensive coverage of the development length characteristics of ½-inch prestressing strand in high-performance lightweight concrete beams. The report describes in detail the gauging and data collection done during the project. The concrete used was the same as covered in Article 78 above. (DL, FB, GI, MP, PR) (f'_c: 6,000-8,000 psi)

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82	Bennenk Janssen	The Shear Stress Capacity of Prestressed Beams Loaded with Shear Force and/or Torsional Moment	Proceedings, Second International Symposium on Structural Lightweight Aggregate Concrete, Kristiansand, Norway	June, 2000	137-147	<p>This paper addresses ultimate shear capacity of high-strength concrete and lightweight concrete beams. The cross sections examined are a normal I-shape where the web has been split down the middle leaving an internal core and creating a "box" beam and a normal square box beam. Specific results on the prestressed LWAC were not available at the time of publication of this article. Expect further results at a later date.</p> <p>(FB, GI, SH, PR) (f_c': 8,000-10,000 psi)</p>
83	Breugel Braam	Compressive Strength of Lightweight Aggregate Concrete Under Sustained Loading	Proceedings, Second International Symposium on Structural Lightweight Aggregate Concrete, Kristiansand, Norway	June, 2000	169-177	<p>This paper addresses the compressive loading of LWC cubes over a specified duration. Two lightweight aggregates were used—Liapor and Lytag. Although inconclusive at this time, it was found that LWC can fail at sustained loads of 80% of f_c' after as little as 5 minutes. The test results were very scattered. The LWC mixes used a silica fume slurry.</p> <p>(FB, GI, SH, PR) (f_c': 9,500 psi)</p>
84	Dehn Konig Fischer	The Influence of Prestressing on the Shear and Flexural Behavior of LWAC	Proceedings, Second International Symposium on Structural Lightweight Aggregate Concrete, Kristiansand, Norway	June, 2000	188-196	<p>This paper discusses the new German Standard DIN 1045 – 1, Model Code MC 90, and ENV 1992-1-1 (EC2) and modifies current design procedures. The authors discuss the application of current NWC practices to LWC and warn that the rules for NWC do not necessarily apply. They assert that parameters like tensile strength, flexural tensile strength and shear capacity are not proportional to the compressive strength. The lightweight concrete mixes use Liapor lightweight aggregate.</p> <p>(FB, GI, SH, PR) (f_c': 8,400-11,500 psi)</p>
85	Hegger Gortz Molter	Shear Cracking Behaviour of Prestressed Beams made of Lightweight Aggregate Concrete	Proceedings, Second International Symposium on Structural Lightweight Aggregate Concrete, Kristiansand, Norway	June, 2000	231-240	<p>This paper examines shear resistance of prestressed high-strength lightweight concrete beams. Both minimum shear reinforcement and compression strut crushing strength were examined. Twelve beams were tested with varied spacing on stirrups. Photogrammetry was used to examine the beams' cracking behavior.</p> <p>(SH, PR) (f_c': 8,000-9,000 psi)</p>

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86	Takacs Kanstad Hynne	Deformations of Stovset Bridge, Measurement and Analysis	Proceedings, Second International Symposium on Structural Lightweight Aggregate Concrete, Kristiansand, Norway	June, 2000	320-329	<p>This article discusses a long-span post-tensioned LWC cantilever box girder bridge in Norway. The bridge was built in 1993 and has been monitored for deflections since that time. The authors review a visco-elastic model for predicting creep and compare numerical results with actual measurements. The authors strongly prefer measuring deflection and creep using leveling techniques (deflection measurement with survey instruments) vice strain gages.</p> <p>(FB, GI, PR) (f_c': 7,500 psi)</p>
87	Daly	Use of Lightweight Aggregate Concrete in Bridges	Proceedings, Second International Symposium on Structural Lightweight Aggregate Concrete, Kristiansand, Norway	June, 2000	345-354	<p>This article is general in nature in covering the use of LWC for bridges. The author discusses the economic benefits of LWC and provides a table of bridges on which an economic analysis has been performed. He discusses material properties briefly providing some general guidelines and comparisons to NWC.</p> <p>(CI, GI, MP)</p>
88	Fergestad Jordet Aas-Jakobsen	The Economical Potential of LWAC in 4 Different Major Bridges	Proceedings, Second International Symposium on Structural Lightweight Aggregate Concrete, Kristiansand, Norway	June, 2000	355-364	<p>This paper discusses economic benefits of LWC bridges citing 4 LWC bridges in Norway as examples. The author concludes that using LWC in lieu of NWC will result in a "break-even" situation. The real benefit in using LWC is in bridges of longer spans.</p> <p>(CI, GI)</p>
89	Fischer Dehn Konig	Pedestrian Composite Bridge Made with Unbonded Prestressed LWAC	Proceedings, Second International Symposium on Structural Lightweight Aggregate Concrete, Kristiansand, Norway	June, 2000	365-374	<p>This paper discusses the construction of a prestressed pedestrian bridge in Leipzig, Germany. The bridge is a steel tube arch filled with HSLWC over which is supported the LWC deck. The paper is descriptive in nature of the bridge and provides limited technical details. The type of lightweight aggregate used was a coated Liapor F8. A dynamic analysis is also included for the bridge.</p> <p>(GI, PR) (f_c': 8,200-11,500 psi)</p>

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90	Rosseland Thorsen	The Stolma Bridge – World Record of Free Cantilevering	Proceedings, Second International Symposium on Structural Lightweight Aggregate Concrete, Kristiansand, Norway	June, 2000	406-415	This article presents details on the construction of the Stolma Bridge in Norway. With a center span of 301 meters, this was the longest free cantilever bridge at the time of construction. The authors discuss the requirements for durability and ability of LWC to perform in the harsh Norwegian weather conditions. Also discussed are deflection predictions using two programs—Diana and Cobe. Good detail is provided on the concrete mix design and specifications. The LWA used was Leka. (GI, MP, PR) (f_c' : 9,000 psi)
91	Smeplass	Drying of Light Weight Aggregate Concrete	Proceedings, Second International Symposium on Structural Lightweight Aggregate Concrete, Kristiansand, Norway	June, 2000	833-843	This article addresses the drying (curing) of LWC made with Stalite LWA. It provides some useful information related to understanding the behavior of LWC as a material. (GI, MP) (f_c' : 9,000 psi)
92	Smeplass	Moisture in Light Weight Aggregates – Practical Consequences for the Production Properties of Light Weight Aggregate Concrete	Proceedings, Second International Symposium on Structural Lightweight Aggregate Concrete, Kristiansand, Norway	June, 2000	844-854	This article accompanies the article on drying of LWA. Stalite LWA is mentioned in this article. The issue of moisture contents is addressed thoroughly. The concept of impregnating the LWA with a material to seal it from absorbing water is covered. This statement from the Summary says it all about moisture control in LWC. “The consequence of this observation may be that the mix water absorption of LWA must be determined in the actual initial moisture condition, as under concrete production, and as often as necessary to detect variation.” (GI, MP) (f_c' : 9,000 psi)
93	Bremner Holm Ries	Enhanced Hydration and Properties of Specified Density Concrete	ESCSI Information Sheet 4248.1	February, 2001	8 Pages	This [paper addresses the concept of enhanced hydration of concrete based on the use of lightweight aggregate. (EH, MP) (f_c' : 9,000 psi)
94	Holm Valsangkar	Lightweight Aggregate Soil Mechanics: Properties and Applications	Transportation Research Record 1422	January, 1993	7-13	Article covers material testing for absorption characteristics. Also covers checking specific gravity of LWA. (MP)
95	Slate Nilson Martinez	Mechanical Properties of High-Strength Lightweight Concrete	ACI Structural Journal Title 83-54	July- August 1986	606-613	Article covers material properties to include strength, modulus of elasticity, poisson's ratio, modulus of rupture. (MP) (f_c' : 3,000-9,000 psi)
96	Goodspeed Vanikar Cook	High-Performance Concrete Defined for Highway Structures	Concrete International	February, 1996	63-67	This article defines grades of high performance concrete 1-4. It is a defining article for HPC and is referenced by GDOT standards for grades. (MP)
97	Zureick	Repair of Concrete Girders with FRP				Not related to lightweight concrete.

#	Author(s)	Title	Source	Date	Page(s)	Notes
98	Zia Mostafa	Development Length of Prestressing Strands	PCI Journal	September-October, 1977	55-65	Provides test information on transfer and development length. Good data on specimens tested. Suggests equation for prediction of both transfer and development length. Also includes much data from other researchers. Mostly a combination of other research efforts. (DL) (fc': 1,000-11,000 psi)
99	Deatherage Burdette	Development Length and Lateral Spacing Requirements of Prestressing Strand for Prestressed Concrete Bridge Girders	PCI Journal	January-February, 1994	70-83	Article presents new equation for transfer and development length. Tested 20 full-scale AASHTO Type I beams. All sizes of strands were tested up through 0.6-in. (DL) (fc': 1,000-11,000 psi)
100	Tabatabai Dickson	The History of the Prestressing Strand Development Length Equation	PCI Journal	November-December, 1993	64-75	Article does just what the title says. (DL)
101	Janney	Nature of Bond in Pre-Tensioned Prestressed Concrete	Journal of the American Concrete Institute	May, 1954	717-736	Early coverage of transfer and development length. (DL) (fc': 6,500 psi)
102	Martin Scott	Development of Prestressing Strand in Pretensioned Members	ACI Journal	August, 1976	453-456	This paper proposes a new equation based on the work of Hanson and Kaar. (DL)
103	Mitchell Cook Khan Tham	Influence of High Strength Concrete on Transfer and Development Length of Pretensioning Strand	PCI Journal Vol 8, No. 3	May/June, 1993	52-66	This article is an excellent source for transfer and development length. The paper discusses the manner of release. The research is based on the use of rectangular sections. Extensive lists of transfer and development lengths from experimental tests are included. (DL) (fc': 3,000-12,000 psi)
104	Brooks Gerstle Logan	Effect of Initial Strand Slip on the Strength of Hollow-Core Slabs	PCI Journal	January-February 1988	90-111	Logan has set the defining bond stress above which all is said to be good. (B) (fc': 5,000 psi)
105	Anderson Anderson	An Assurance Criterion for Flexural Bond in Pretensioned Hollow Core Units	ACI Journal	August 1976	457-464	Discussion of development length and flexural bond. (DL) (fc': 9,000-12,000 psi)
106	Hanson Kaar	Flexural Bond Tests of Pretensioned Prestressed Beams	Journal of the American Concrete Institute	January, 1959	783-802	Two major players on the subject of transfer and development length. (DL) (fc': 5,000-7,000 psi)
107	Carreira Chu	Stress-Strain Relationship for Plain Concrete in Compression	ACI Journal	November-December 1985	797-803	This article provides a method for estimating the stress strain curve for concrete. (FB)
108	Wee Chin MANSUR	Stress-Strain Relationship of High-Strength Concrete	Journal of Materials in Civil Engineering	May 1996	70-76	This article provides a method for estimating the stress strain curve for concrete. (FB)
109	Cousins Johnston Zia	Development Length of Epoxy Coated Prestressing Strand	ACI Materials Journal	July-August 1990	309-318	This article addresses development length and bond fatigue of epoxy coated prestressing strand. (DL) (fc': 5,000 psi)

#	Author(s)	Title	Source	Date	Page(s)	Notes
110	Buckner	A Review of Strand Development Length for Pretensioned Members	PCI Journal	March-April 1995	84-98	This article addresses both transfer and development length. Recommendations are made for both transfer and development lengths. (DL)
111	Hansen	Static and Dynamic Elastic Modulus of Concrete as Affected by Mix Composition and Compressive Strength	ACI Special Publication SP95	1986	115-137	This article provides a good coverage of the relation between concrete strength and modulus of elasticity. This article covers the origination of the current equation in ACI 318. (MP) (fc': 1,000-11,000 psi)
112	ACI Committee 363	State-of-the-Art Report on High-Strength Concrete	ACI363R-84	1987		This article provides information on material and other related properties of high-strength concrete. (MP)
113	Daly	Use of Lightweight Aggregate Concrete in Bridges	The Economist			This article provides an overview of the benefits of using LWA in bridges. It contains no technical material. (GI)
114	Grace Sayed Soliman Saleh	Strengthening Reinforced Concrete Beams Using Fiber Reinforced Polymer (FRP) Laminates	ACI Structural Journal	September-October 1999	865-874	
115	Kahn	Research Proposal for Use of High-Strength/High-Performance Concrete for Precast Prestressed Concrete Bridges in Georgia		April 1996		This is the research proposal for the previous project.
116	Saber	High Performance Concrete: Behavior, Design, and Materials in Pretensioned AASHTO and NU Girders	PhD Thesis	June 1998	500 pages	
117	Barnes Burns Kreger	Development Length of 0.6-inch Prestressing Strand in Standard I-Shaped Pretensioned Concrete Beams	Research Report 1388-1	December 1999	318 pages	This report provides the report of testing of normal weight I-shaped girders at the University of Texas. It is an excellent reference for test data and information on development length. Transfer length is also covered. (DL) (fc': 5,000-11,000 psi)
118	FHWA	A New Development Length Equation for Pretensioned Strands in Bridge Beams and Piles	Publication No. FHWA-RD-98-116	December 1998	110 pages	Good thing to begin reading. See page 22 for good summary of research. (DL)
119	Peterman Ramirez Olek	Evaluation of Strand Transfer and Development Lengths in Pretensioned Girders with Semi-Lightweight Concrete	Final Report FHWA/IN/JTRP-99/3	July 1999	89 pages with Appendices A-E	Good reference to examine for other current work (DL)

#	Author(s)	Title	Source	Date	Page(s)	Notes
120	Kahn Lai Reutlinger Dill Shams	Direct Pull-out Capacity, Transfer and Development Length of 0.6-inch Diameter Prestressing Strand in High-Performance Concrete	Task 5 Final Report GDOT Research Project No. 9510	April 2000	419	Also a good place to start for development length (DL)
121	Ramirez Olek Rolle Malone	Performance of Bridge Decks and Girders with Lightweight Aggregate Concrete	Final Report FHWA/IN/JTRP-98/17	October 2000	615	
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142	Reutlinger	Direct Pull-out Capacity and Transfer Length of 0.6-inch Diameter Prestressing Strand in High Performance Concrete	Master's Thesis	June 1999	352 pages	Much of the same information from reference 120 but with more detail. (DL)
143	Muttoni Schwartz Thurlimann	Design of Concrete Structures with Stress Fields	Birkhauser	1997	143 pages	Good reference for modified compression field theory (SH)
144	Dill	Development Length of 0.6-Inch diameter Prestressing Strand in High-Performance Concrete	Master's Thesis	May 2000	322 pages	Much of the same from reference 120. (DL)

#	Author(s)	Title	Source	Date	Page(s)	Notes
145	Collins Mitchell	Prestressed Concrete Structures	Prentice Hall, Englewood Cliffs, New Jersey	1991	766 pages	
146	Russell	Design guidelines for Transfer, Development and Debonding of Large Diameter Seven Wire Strands in Pretensioned Concrete Girders	PhD Dissertation	1992	464 pages	Excellent resource for transfer and development length. (DL) (fc': 5,000-7,800 psi)
147	Hartmann Breen Kreger	Shear Capacity of High Strength Prestressed Concrete Girders	Research Report 381-2 Project 3-5-84- 381 Center for Transportation Research	January 1988	249 pages	
148	FIB	Bond of Reinforcement in Concrete State-of-the- Art Report	FIB bulletin 10	August 2000	427 pages	See chapter 6 for information on transfer length
149	Nawy	Prestressed Concrete, Third Edition	Prentice Hall, Englewood Cliffs, New Jersey	2000	938 pages	
150	Mehta Monteiro	Concrete Microstructure, Properties, and Materials Second Edition	McGraw Hill New York, NY	1993	548 pages	Great reference for concrete as a material.
151	MacGregor	Reinforced Concrete Mechanics and Design Second Edition	Prentice Hall, Englewood Cliffs, New Jersey	1992	848 pages	
152	AASHTO Standard	AASHTO Design Manual for Bridges Standard 1996	AASHTO	1996		
153	AASHTO LRFD	AASHTO Design Manual for Bridges LRFD 1998	AASHTO	1998		
154	ACI 213 Committee	ACI 213 Design Guide for Lightweight Concrete				Currently under review and revision