



CERTIFICATE OF ACCREDITATION

This is to attest that

CTLGROUP

5400 OLD ORCHARD ROAD
SKOKIE, ILLINOIS 60077, U.S.A.

Testing Laboratory TL-200

has met the requirements of AC89, *IAS Accreditation Criteria for Testing Laboratories*, and has demonstrated compliance with ISO/IEC Standard 17025:2017, *General requirements for the competence of testing and calibration laboratories*. This organization is accredited to provide the services specified in the scope of accreditation.

Effective Date March 13, 2023



A handwritten signature in black ink, reading "Raj Nathan".

President

SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

3060 Saturn Street, Suite 100, Brea, California 92821, U.S.A. | www.iasonline.org

CTLGROUP

Contact Name Dr. Boyd Clark

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Accredited to ISO/IEC 17025:2017

Effective Date March 13, 2023

Chemistry	
AASHTO T 290-95 (2020) Part I and Part II, Method A	Standard Method of Test for Determining Water-Soluble Sulfate Ion Content in Soil
ASSHTO T 291-94 (2018) Part I and Part II, Method B	Standard Method of Test for Determining Water-Soluble Chloride Ion Content in Soil
CTLGroup WI40-FTIR	Infrared analysis (FTIR)
CTLGroup WI40-pH	Test method of pH of aqueous solutions and verification of field pH strip
CTLGroup WI40-XRD	Determination of the proportion of phases in powdered samples using X-ray diffraction
CTLGroup WI40-XRF	X-ray fluorescence spectrometry scan and semi-quantitative analysis
CMT	
ASTM C25	Standard test methods for chemical analysis of limestone, quicklime, and hydrated lime
ASTM C91/C91M	Standard specification for masonry cement
ASTM C109/C109M	Standard test method for compressive strength of hydraulic cement mortars (compression only, using 2-in. or [50-mm] cube specimens)
ASTM C114	Standard test method for chemical analysis of hydraulic cement
ASTM C150 / C150M	Standard Specification for portland cement
ASTM C151/C151M	Standard test method for autoclave expansion of hydraulic cement
ASTM C185	Standard test method for air content of hydraulic cement mortar
ASTM C186	Standard test method for heat of hydration of hydraulic cement
ASTM C188	Standard test method for density of hydraulic cement
ASTM C191	Standard test methods for time of setting of hydraulic cement by Vicat needle
ASTM C204	Standard test methods for fineness of hydraulic cement by air-permeability apparatus

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ASTM C227	Standard test method for potential alkali reactivity of cement-aggregate combinations (mortar-bar method)
ASTM C266	Standard test method for time of setting of hydraulic-cement paste by Gillmore needles
ASTM C270	Standard specification for mortar for unit masonry
ASTM C311/C311M	Standard test methods for sampling and testing fly ash or natural pozzolans for use in portland-cement concrete
ASTM C348	Standard test method for flexural strength of hydraulic-cement mortars
ASTM C430	Standard test method for fineness of hydraulic cement by the 45- μ m (no. 325) sieve
ASTM C441/C441M	Standard test method for effectiveness of pozzolans or ground blast-furnace slag in preventing excessive expansion of concrete due to the alkali-silica reaction
ASTM C451	Standard test method for early stiffening of hydraulic cement (paste method)
ASTM C452	Standard test method for potential expansion of portland-cement mortars exposed to sulfate
ASTM C482	Standard test method for bond strength of ceramic tile to portland cement paste
ASTM C604	Standard test method for true specific gravity of refractory materials by gas-comparison pycnometer
ASTM C641	Standard test method for iron staining materials in lightweight concrete aggregates
ASTM C780	Standard test method for preconstruction and construction evaluation of mortars for plain and reinforced unit masonry
ASTM C1019	Standard test method for sampling and testing grout
ASTM C1038/C1038M	Standard test method for expansion of hydraulic cement mortar bars stored in water
ASTM C1064/C1064M	Standard test method for temperature of freshly mixed hydraulic cement concrete
ASTM C1152/C1152M	Standard test method for acid-soluble chloride in mortar and concrete
ASTM C1218/C1218M	Standard test method for water-soluble chloride in mortar and concrete
ASTM C1222	Standard practice for evaluation of laboratories testing hydraulic cement
ASTM C1260	Standard test method for potential alkali reactivity of aggregates (mortar-bar method)
ASTM C1324	Standard test method for examination and analysis of hardened masonry mortar

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ASTM C1437	Standard test method for flow of hydraulic cement mortar
ASTM C1556	Standard test method for determining the apparent chloride diffusion coefficient of cementitious mixtures by bulk diffusion
ASTM C1567	Standard test method for determining the potential alkali-silica reactivity of combinations of cementitious materials and aggregate (accelerated mortar-bar method)
ASTM C1702	Standard test method for measurement of heat of hydration of hydraulic cementitious materials using isothermal conduction calorimetry
ASTM D1426	Standard test methods for ammonia nitrogen in water
Physical	
AASHTO T 336	Standard method of test for coefficient of thermal expansion of hydraulic cement concrete
AREMA	Manual for railway engineering (chapter 30 (ties), sections 4.9.1.1, 4.9.1.2, 4.9.1.3 only)
ASTM C29/C29M	Standard test method for bulk density ("unit weight") and voids in aggregate
ASTM C31/C31M	Standard practice for making and curing concrete test specimens in the field
ASTM C39/C39M	Standard test method for compressive strength of cylindrical concrete specimens
ASTM C40/C40M	Standard test method for organic impurities in fine aggregates for concrete
ASTM C42/C42M	Standard test method for obtaining and testing drilled cores and sawed beams of concrete
ASTM C67	Standard test methods for sampling and testing brick and structural clay tile
ASTM C78/C78M	Standard test method for flexural strength of concrete (using simple beam with third-point loading)
ASTM C88	Standard test method for soundness of aggregates by use of sodium sulfate or magnesium sulfate
ASTM C117	Standard test method for materials finer than 75- μ m (no. 200) sieve in mineral aggregates by washing
ASTM C123/C123M	Standard test method for lightweight particles in aggregate
ASTM C127	Standard test method for relative density (specific gravity) and absorption of coarse aggregate
ASTM C128	Standard test method for relative density (specific gravity) and absorption of fine aggregate
ASTM C131/C131M	Standard test method for resistance to degradation of small-size coarse aggregate by abrasion and impact in the Los Angeles machine

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ASTM C136/C136M	Standard test method for sieve analysis of fine and coarse aggregates
ASTM C138/C138M	Standard test method for density (unit weight), yield, and air content (gravimetric) of concrete
ASTM C140/C140M	Standard test methods for sampling and testing concrete masonry units and related units
ASTM C142/C142M	Standard test method for clay lumps and friable particles in aggregates
ASTM C143/C143M	Standard test method for slump of hydraulic-cement concrete
ASTM C157/C157M	Standard test method for length change of hardened hydraulic-cement mortar and concrete
ASTM C172/C172M	Standard practice for sampling freshly mixed concrete
ASTM C173/C173M	Standard test method for air content of freshly mixed concrete by the volumetric method
ASTM C177	Standard test method for steady-state heat flux measurements and thermal transmission properties by means of the guarded-hot-plate apparatus
ASTM C187	Standard test method for amount of water required for normal consistency of hydraulic cement paste
ASTM C192/C192M	Standard practice for making and curing concrete test specimens in the laboratory
ASTM C215	Standard test method for fundamental transverse, longitudinal, and torsional resonant frequencies of concrete specimens
ASTM C231/C231M	Standard test method for air content of freshly mixed concrete by the pressure method
ASTM C232/C232M	Standard test method for bleeding of concrete
ASTM C293/C293M	Standard test method for flexural strength of concrete (using simple beam with center-point loading)
ASTM C295/C295M	Standard guide for petrographic examination of aggregates for concrete
ASTM C403/C403M	Standard test method for time of setting of concrete mixtures by penetration resistance
ASTM C457/C457M	Standard test method for microscopical determination of parameters of the air-void system in hardened concrete (excluding Procedure C)
ASTM C469/C469M	Standard test method for static modulus of elasticity and Poisson's ratio of concrete in compression
ASTM C496	Standard test method for splitting tensile strength of cylindrical concrete specimens
ASTM C512	Standard test method for creep of concrete in compression

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ASTM C535	Standard test method for resistance to degradation of large-size coarse aggregate by abrasion and impact in the Los Angeles machine
ASTM C566	Standard test method for total evaporable moisture content of aggregate by drying
ASTM C567/C567M	Standard test method for determining density of structural lightweight concrete
ASTM C581	Standard Practice for Determining Chemical Resistance of Thermosetting Resins Used in Glass-Fiber-Reinforced Structures Intended for Liquid Service, except Section 5.1
ASTM C596	Standard test method for drying shrinkage of mortar containing hydraulic cement
ASTM C617/C617M	Standard practice for capping cylindrical concrete specimens
ASTM C642	Standard test method for density, absorption, and voids in hardened concrete
ASTM C666/C666M	Standard test method for resistance of concrete to rapid freezing and thawing
ASTM C672/C672M	Standard test method for scaling resistance of concrete surfaces exposed to deicing chemicals
ASTM C702/C702M	Standard practice for reducing samples of aggregate to testing size
ASTM C779/C779M	Standard test method for abrasion resistance of horizontal concrete surfaces
ASTM C856	Standard practice for petrographic examination of hardened concrete
ASTM C1012/C1012M	Standard test method for length change of hydraulic- cement mortars exposed to a sulfate solution
ASTM C1077	Standard practice for agencies testing concrete and concrete aggregates for use in construction and criteria for testing agency evaluation
ASTM C1105	Standard test method for length change of concrete due to alkali-carbonate rock reaction
ASTM C1116/C1116M	Standard specification for fiber-reinforced concrete
ASTM C1202	Standard test method for electrical indication of concrete's ability to resist chloride ion penetration
ASTM C1314	Standard test method for compressive strength of masonry prisms
ASTM C1581/C1581M	Standard test method for determining age at cracking and induced tensile stress characteristics of mortar and concrete under restrained shrinkage
ASTM C1585	Standard test method for measurement of rate of absorption of water by hydraulic-cement concretes
ASTM C1609/C1609M	Standard test method for flexural performance of fiber-reinforced concrete (using beam with third-point loading)

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ASTM D968	Standard test methods for abrasion resistance of organic coatings by falling abrasive
ASTM D1141	Standard Practice for Preparation of Substitute Ocean Water excluding Sections 5.4, 5.5 and 5.6
ASTM D1875	Standard test method for density of adhesives in fluid form
ASTM D2247	Standard Practice for Testing Water Resistance of Coatings in 100 % Relative Humidity
ASTM D2344	Standard Test Method for Short-Beam Strength of Polymer Matrix Composite Materials and Their Laminates, excluding Section 7.5
ASTM D2395	Standard test methods for density and specific gravity (relative density) of wood and wood-based materials
ASTM D2556	Standard test method for apparent viscosity of adhesives having shear-rate-dependent flow properties using rotational viscometry
ASTM D2990	Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep rupture of Plastics (Excluding Section 6.2)
ASTM D3039	Standard Test Method for Tensile Properties of Polymer Matrix Composite Materials
ASTM D3045	Standard Practice for Heat Aging of Plastics Without Load
ASTM D3083	Standard Specification for Flexible Poly (Vinyl Chloride) Plastic Sheeting for Pond, Canal, and Reservoir Lining, Sections 9.1 and 9.3 only
ASTM D3165	Standard Test Method for Strength Properties of Adhesives in Shear by Tension Loading of Single-Lap-Joint Laminated Assemblies
ASTM D4541	Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers (Test per A1 only)
ASTM D4791	Standard test method for flat particles, elongated particles, or flat and elongated particles in coarse aggregate
ASTM D6928	Standard test method for resistance of coarse aggregate to degradation by abrasion in the micro-deval apparatus
ASTM D7012 (Method C)	Standard test methods for compressive strength and elastic moduli of intact rock core specimens under varying states of stress and temperatures
ASTM E96/E96M	Standard test methods for water vapor transmission of materials
ASTM E518	Standard Test Methods for Flexural Bond Strength of Masonry
ASTM F1575	Standard test method for determining bending yield moment of nails
COE CRD-C-130	Standard recommended practice for estimating scratch hardness of coarse aggregate particles

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NCM NT Build 492	Concrete, mortar and cement-based repair materials: chloride migration coefficient from non-steady-state migration experiments
Structural	
1997 UBC 19-1	Welding reinforcing steel, metal inserts and connections in reinforced concrete construction
AASHTO T 336	Standard method of test for coefficient of thermal expansion of hydraulic cement concrete
ACI 355.2	Qualification of post-installed mechanical anchors in concrete
ACI 355.4	Qualification of post-installed adhesive anchors in concrete
AISI S904	Standard test methods for determining the tensile and shear strengths of screws
AISI S905	Test standard for cold-formed steel connections
ASTM A370	Standard test methods and definitions for mechanical testing of steel products (excluding section 18, Rockwell hardness test)
ASTM A416/A416M	Standard specification for low-relaxation, seven-wire steel strand for prestressed concrete
ASTM A421/A421M	Standard specification for stress-relieved steel wire for prestressed concrete
ASTM A615/A615M	Standard specifications for deformed and plain carbon-steel bars for concrete reinforcement
ASTM A706/A706M	Standard specification for deformed and plain low-alloy steel bars for concrete reinforcement
ASTM A722/A722M	Standard specification for high-strength steel bars for prestressed concrete
ASTM A767/A767M	Standard specification for zinc-coated (galvanized) steel bars for concrete reinforcement
ASTM A775/A775M	Standard specification for epoxy-coated steel reinforcing bars
ASTM A882/A882M	Standard specification for filled epoxy-coated seven-wire prestressing steel strand
ASTM A934/A934M	Standard specification for epoxy-coated prefabricated steel reinforcing bars
ASTM A944	Standard test method for comparing bond strength of steel reinforcing bars to concrete using beam-end specimens
ASTM A1061/A1061M	Standard test methods for testing multi-wire steel prestressing strand
ASTM B117	Standard practice for operating salt spray (fog) apparatus
ASTM C1513	Standard specification for steel tapping screws for cold-formed steel framing connections

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ASTM C1892	Standard test methods for strength of anchors in masonry (except section 12 (shock))
ASTM D1037	Standard test methods for evaluating properties of wood-base fiber and particle panel materials
ASTM D1761	Standard test methods for mechanical fasteners in wood and wood-based materials
ASTM D4442	Standard test methods for direct moisture content measurement of wood and wood-based materials
ASTM D4444	Standard test method for laboratory standardization and calibration of hand-held moisture meters
ASTM E8	Standard test methods for tension testing of metallic materials
ASTM E72	Standard test methods of conducting strength tests of panels for building construction
ASTM E139	Standard test methods for conducting creep, creep-rupture, and stress-rupture tests of metallic materials
ASTM E328	Standard test methods for stress relaxation tests for materials and structures
ASTM E330/E330M	Standard test method for structural performance of exterior windows, doors, skylights and curtain walls by uniform static air pressure difference
ASTM E488	Standard test methods for strength of anchors in concrete elements (except section 9.5)
ASTM E519	Standard test method for diagonal tension (shear) in masonry assemblages
ASTM E1190	Standard test methods for strength of power-actuated fasteners installed in structural members
ASTM E1512	Standard test methods for testing bond performance of bonded anchors
ASTM F606	Standard test methods for determining the mechanical properties of externally and internally threaded fasteners, washers, direct tension indicators, and rivets
CT 670	Method of test for mechanical and welded reinforcing steel splices
ETAG 001	Guideline for European technical approval of metal anchors for use in concrete
EOTA TR049	Post-installed fasteners in concrete under seismic action
IAPMO EC 038	Acceptance Criteria for Concrete and Reinforced and Unreinforced Masonry Strengthening Using Externally Bonded Fiber-Reinforced Polymer (FRP) Composite Systems
ICC ES AC01	Acceptance criteria for mechanical anchors in cracked and uncracked masonry elements

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ICC ES AC58	Acceptance criteria for adhesive anchors in cracked and uncracked masonry elements
ICC ES AC60	Acceptance criteria for anchors in unreinforced masonry elements
ICC ES AC70	Acceptance criteria for power-actuated fasteners driven into concrete, steel and masonry elements (except section 4.7)
ICC ES AC106	Acceptance criteria for predrilled fasteners (screw anchors) in masonry (except section 4.7)
ICC ES AC118	Acceptance Criteria for Tapping Screw Fasteners used in Steel-to-Steel Connections
ICC ES AC125	Acceptance Criteria for Concrete and Reinforced and Unreinforced Masonry Strengthening Using Externally Bonded Fiber-Reinforced Polymer (FRP) Composite Systems (Test methods referenced in Section 5 Excluding Sections 5.9, 5.13, 5.14 and 5.18)
ICC ES AC133	Mechanical splice systems for steel reinforcing bars (test methods referenced in sections 3.0 and 4.0)
ICC ES AC193	Acceptance criteria for mechanical anchors in concrete elements (except section 3.7)
ICC ES AC232	Acceptance criteria for anchor channels in concrete elements (except section 3.4)
ICC ES AC233	Acceptance criteria for dowel-type threaded fasteners used in wood
ICC ES AC237	Threaded high-strength steel bars for concrete reinforcement (test methods referenced in section 4.0)
ICC ES AC303	Post-tensioning anchorages and couplers of prestressed concrete (test methods referenced in sections 3.0 and 4.0)
ICC ES AC308	Acceptance criteria for post-installed adhesive anchors in concrete elements
ICC ES AC446	Acceptance criteria for headed cast-in specialty inserts in concrete
ICC ES AC491	Acceptance Criteria for Self-Drilling Tapping Screws used with Aluminum (excluding ASTM test methods B557 and E18)
ICC ES AC500	Acceptance criteria for self-drilling tapping screws used to attach miscellaneous building materials to steel base material
ICC ES AC509	Acceptance criteria for 3D automated construction technology for 3D concrete walls (except section 3.4)
ICC ES AC510	Acceptance criteria for seismic qualification of post-installed anchors in concrete

AASHTO: *The American Association of State Highway and Transportation Officials*

ACI: *American Concrete Institute*

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AISI: American Iron and Steel Institute

AREMA: American Railway Engineering and Maintenance-of-Way Association

ASTM: American Society for Testing and Materials

COE: Army Corps of Engineers

CT: California Department of Transportation

EOTA: European Organization for Technical Assessments

ETAG: European Organization for Technical Approvals

ICC ES: International Code Council Evaluation Service

NCM: Nordic Council of Ministers

UBC: Uniform Building Code