

Notes for user: *The intent is to minimize the greenhouse gas emissions of concrete, measured by the global warming potential, or “carbon footprint”. This is commonly achieved by substituting one or several pozzolans, such as fly ash, slag, or natural pozzolans, for Portland cement, and/or relaxing strength/time requirements wherever practicable (e.g., minimum compressive strength at 56, not 28, days), and/or using carbon-absorbing technologies for aggregate and curing. The project engineer (or concrete specifier) is urged NOT to specify minimum cement content, water/cement ratios, or anything else but the project’s performance requirements; let the concrete ready mix supplier design the optimal mixes.*

A) Governing standards

Concrete: ACI 301-19

Ready-mix concrete: ASTM C94,

and Marin County Code Chapter 19.07

Cement: ASTM C150 type I, II, IL, IS, IT or IP

Aggregate: ASTM C33, of 3/4 inch maximum size

Reinforcing: ASTM A615 Grade 40 deformed bars; bend or lap bars around corners and between pours at least 24 inches.

B) Materials and workmanship

Conform to the latest recommendations of the American Concrete Institute. Concrete shall be of adequate consistency to intimately engage all rebar, with concrete cover of reinforcing per [*insert relevant section of governing code, e.g., 2019 CBC chapter 19*] minimums.

C) Minimum strengths

Minimum concrete compressive strengths are to be as follows:

- a) Drilled piers: 2500 psi compressive strength @ 84 days
- b) Footings and grade beams: 4000 psi @ 56 days
- c) Retaining walls: 3000 psi compressive strength @ 14 days
- d) Slabs: 2500 psi compressive strength @ 56 days
- e) Shotcrete (if used): 3000 psi compressive strength @ 14 days

D) Admixtures

Use as needed for hot or cold weather, set acceleration, workability, or to assist meeting low-carbon requirements. Test and document all combinations of admixtures and pozzolans at 7, 14, 28 and 56 days.

E) Compliance

Supply completed Low Carbon Concrete Compliance Form to Building Official after completion of concrete work, along with mix designs and corresponding batch tickets. This form shall be completed by General Contractor and submitted to the Architect within 6 weeks of completion of the concrete work, for compliance with project Low Carbon Concrete requirements. The mix design number listed on the *Low Carbon Concrete Compliance Form* must match the mix design number shown on the proposed mix design.

Low Carbon Concrete Compliance Form (Cement)

This form shall be completed by the party indicated under each section for compliance with project Low-Carbon Concrete requirements

Project name _____

Date _____

DESIGN TEAM TO COMPLETE FOR PLAN CHECK APPROVAL						CONTRACTOR TO COMPLETE				
<i>Structural engineer shall complete and include within concrete specification of the Project Manual submitted to the building department for plan check.</i>						<i>General Contractor shall complete and submit to the Architect within 6 weeks of completion of the concrete work.</i>				
Date:						Date:				
Structural Engineer Company Name:						General Contractor Company Name:				
Signature:						Signature:				
Print Name:						Print Name:				
Concrete mixture name	Design strength, f'c per spec (psi)	Used for (indicate if needs early strength)	Volume Estimated (cyd)	Max Cement Content per spec (lb/cyd)	Cement Limit per code (lb/cyd)	Volume Supplied (cyd)	Concrete Supplier Name	Concrete Batch Code	Actual Cement Content (lb/cyd)	Cement Limit per code (lb/cyd)
<i>Type A</i>	<i>5000</i>	<i>Foundation</i>	<i>1000</i>	<i>250</i>	<i>See code</i>	<i>1100</i>	<i>ABC Concrete</i>	<i>ABC123XYZ</i>	<i>245</i>	<i>See code</i>
These rows only for use if contractor is pursuing budget method		Total cement of all concrete used on Project (lbs)				Total cement of all concrete used on Project (lbs)				
		Total cement allowed for all concrete on Project (lbs)				Total cement allowed for all concrete on Project (lbs)				
Signature of Approval at Plan Check:						Signature of Approval for TCO Permit:				
Print Name:						Print Name:				
Date:						Date:				

Low Carbon Concrete Compliance Form (Embodied Carbon)

This form shall be completed by the party indicated under each section for compliance with project Low-Carbon Concrete requirements

Project name _____

Date _____

DESIGN TEAM TO COMPLETE FOR PLAN CHECK APPROVAL						CONTRACTOR TO COMPLETE				
<i>Structural engineer shall complete and include within concrete specification of the Project Manual submitted to the building department for plan check.</i>						<i>General Contractor shall complete and submit to the Architect within 6 weeks of completion of the concrete work.</i>				
Date:						Date:				
Structural Engineer Company Name:						General Contractor Company Name:				
Signature:						Signature:				
Print Name:						Print Name:				
Concrete mixture name	Design strength, f'c per spec (psi)	Used for (indicate if needs early strength)	Volume Estimated (cyd)	Max EC per spec (kg/m ³)	EC Limit per code (kg/m ³)	Volume Supplied (cyd)	Concrete Supplier Name	Concrete Batch Code	Actual EC (kg/m ³)	EC Limit per code (kg/m ³)
<i>Type A</i>	<i>5000</i>	<i>Foundation</i>	<i>1000</i>	<i>250</i>	<i>See code</i>	<i>1100</i>	<i>ABC Concrete</i>	<i>ABC123XYZ</i>	<i>245</i>	<i>See code</i>
These rows only for use if contractor is pursuing budget method		Total EC of all concrete used on Project (kgCO ₂ e)				Total EC of all concrete used on Project (kgCO ₂ e)				
		Total EC allowed for all concrete on Project (kgCO ₂ e)				Total EC allowed for all concrete on Project (kgCO ₂ e)				
Signature of Approval at Plan Check:						Signature of Approval for TCO Permit:				
Print Name:						Print Name:				
Date:						Date:				