



CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Footings: Proportion normal-weight concrete as follows.
1. Compressive Strength: 3000 PSI at 28 days.
 2. Maximum Water-Cement Ratio: 0.55
 3. Slump Limit: 2-4" with Normal Water Reducer. 4-6" with Mid-Range Water Reducer. 6-8" with High Range Water Reducer.
 4. Air Content: 6.5 percent, plus or minus 1.5 percent at the point of delivery for 1-inch nominal maximum aggregate size.
- B. Footings/Foundations: Proportion normal-weight concrete as follows:
1. Compressive Strength: 4000 PSI at 28 days.
 2. Maximum Water-Cement Ratio: 0.50
 3. Slump Limit: 2-4" with Normal Water Reducer. 4-6" with Mid-Range Water Reducer. 6-8" with High Range Water Reducer.
 4. Air Content: 6.5 percent, plus or minus 1.5 percent at the point of delivery for 1-inch nominal maximum aggregate size.
- C. Slab on Grade: Proportion normal-weight concrete as follows:
1. Compressive Strength: 4000 PSI at 28 days.
 2. Maximum Water-Cement Ratio: 0.48
 3. Slump Limit: 2-4" with Normal Water Reducer. 4-6" with Mid-Range Water Reducer. 6-8" with High Range Water Reducer.
 4. Air Content: 4% Max - No entrained air allowed.
- D. Slab on Grade: Proportion normal-weight concrete as follows:
1. Compressive Strength: 4000 PSI at 28 days.
 2. Maximum Water-Cement Ratio: 0.48
 3. Imported Sand – Past service history free from aggregate popouts.
 4. Slump Limit: 2-4" with Normal Water Reducer. 4-6" with Mid-Range Water Reducer. 6-8" with High Range Water Reducer.
 5. Air Content: 4% Max - No entrained air allowed.
- E. Suspended Slabs/Toppings: Proportion normal-weight concrete as follows:
1. Compressive Strength: 4000 PSI at 28 days.
 2. Maximum Water-Cement Ratio: 0.48
 3. Slump Limit: 2-4" with Normal Water Reducer. 4-6" with Mid-Range Water Reducer. 6-8" with High Range Water Reducer.
 4. Air Content: 4% Max - No entrained air allowed.



- F. Exterior Slabs: Proportion normal-weight concrete as follows.
1. Compressive Strength: 4000 PSI at 28 days.
 2. Maximum Water-Cement Ratio: 0.45
 3. Slump Limit: 2-4" with Normal Water Reducer. 4-6" with Mid-Range Water Reducer. 6-8" with High Range Water Reducer.
 4. Air Content: 6.5 percent, plus or minus 1.5 percent at the point of delivery for 1-inch nominal maximum aggregate size.
- G. Columns/Beams: Proportion normal-weight concrete as follows.
1. Compressive Strength: 5000 PSI at 28 days.
 2. Maximum Water-Cement Ratio: 0.45
 3. Slump Limit: 2-4" with Normal Water Reducer. 4-6" with Mid-Range Water Reducer. 6-8" with High Range Water Reducer.
 4. Air Content: 6.5 percent, plus or minus 1.5 percent at the point of delivery for 1-inch nominal maximum aggregate size.
- H. Industrial Slabs.
1. Compressive Strength: 4000 PSI at 28 days.
 2. Maximum Water-Cement Ratio: 0.53
 3. Imported Sand – Past service history free from aggregate popouts.
 4. Adjust proportions of combined coarse, intermediate, and fine aggregates to provide the following particle size distribution characteristics, unless otherwise approved:
 - 1) Coarseness Factor of 60 to 70 %.
 - a) The Coarseness Factor (CF) is the percent of combined aggregate retained on the #8 sieve that is also retained on the 3/8" sieve.
 - b) The Coarseness Factor is calculated as follows: $CF = \frac{\text{Aggregate retained on the } 3/8'' \text{ sieve}}{\text{Aggregate retained on the } \#8 \text{ sieve}}$.
 - 2) Adjusted Workability Factor
 - a) The Workability Factor (WF) is the percent of combined aggregate that passes the #8 sieve.
 - b) The Adjusted Workability Factor (Adj-WF) is calculated as follow:
$$\text{Adj-WF} = \text{WF} + [\text{Cementitious Material} - 564\text{lbs}] / 37.6$$
 - c) The range of accepted Adj-WF for a given CF is as follows:
$$\text{Adj-WF} = [(11.25 - .15CF) + 35.5] \pm 2.5.$$
 - 3) Combined percent retained on any given sieve size shall not exceed 24%.
 - 4) Gradation requirement of ASTM C33 may be waived in order to meet ranges specified.
 5. Slump Limit: 2-4" with Normal Water Reducer. 4-6" with Mid-Range Water Reducer. 6-8" with High Range Water Reducer.
 6. Air Content: 4% Max - No entrained air allowed.