

ORDINANCE NO. 166

AN ORDINANCE OF THE CITY COUNCIL OF THE
CITY OF RIDGECREST, CALIFORNIA, ADOPTING
MINIMUM SPECIFICATIONS FOR AGGREGATE IN
CONCRETE USED IN CONSTRUCTION OF BUILDINGS

THE CITY COUNCIL OF THE CITY OF RIDGECREST, CALIFORNIA,
DOES ORDAIN AS FOLLOWS:

Section 1. Ordinance No. 49, as amended by Ordinance No.
138, is hereby amended to add Section 9 as follows:

Section 9. In addition to the requirement for
concrete quality specified in Section 2605 of
Volume 1 of the Uniform Building Code, 1970
Edition, published by the International Con-
ference of Building Officials, all concrete
aggregate shall conform to the requirements
set forth in Sections 90-2.02 through 90-3.04
of the Standard Specifications of the State
of California Department of Public Works,
Division of Highways, January, 1971, edition.

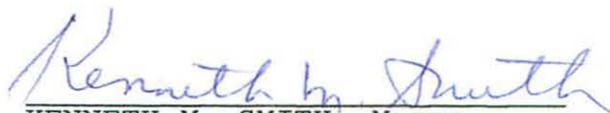
Section 2. The City Clerk shall publish this ordinance in
the manner required by law.

APPROVED AND ADOPTED this 20 day of July, 1972,
by the following vote:

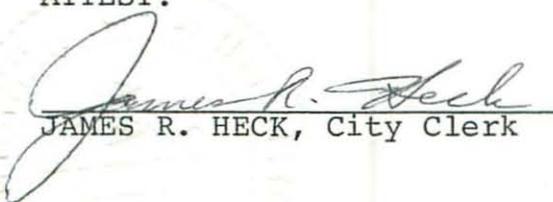
AYES: Mayor Smith, Councilmen Fox, Mettenburg, Shacklett,
and Wilson.

NOES: None.

ABSENT: None.


KENNETH M. SMITH, Mayor

ATTEST:


JAMES R. HECK, City Clerk

- (3) The cement shall meet the requirements for compressive strength. The tensile strength shall not apply.
- (4) The autoclave expansion shall not exceed 0.50 percent.
- (5) Mortar, containing the portland cement to be used and Ottawa sand, when tested in accordance with Test Method No. Calif. 527, shall not expand in water more than 0.010 percent and shall not contract in air more than 0.048 percent.

Portland cement used for precast prestressed concrete piling and precast prestressed concrete members will be designated as "Type II Prestress" and shall conform to the requirements for Type II Modified except that the mortar when tested in accordance with Test Method No. Calif. 527, shall not contract in air more than 0.053 percent.

Either Type II Prestress or Type II Modified cement may be used in steam-cured concrete products.

All cement used in the manufacture of cast-in-place concrete for exposed surfaces of like elements of a structure shall be of the same brand.

The cement shall be protected from exposure to moisture until used. Sacked cement shall be so piled as to permit access for tally, inspection, and identification of each shipment.

The Contractor shall make arrangements with the manufacturer of ready-mixed concrete, or precast concrete products, to provide adequate facilities to assure that cement meeting the requirements specified in this Section 90-2.01 will be kept separate from other cement in order to prevent any but the specified cement entering the work. The Contractor shall also make arrangements with said manufacturer to provide safe and suitable facilities for sampling cement at the weighing hopper, or in the feed line immediately before entering the hopper.

If cement is used prior to sampling and testing as provided in Section 6-1.07, "Certificates of Compliance," and the cement is delivered directly to the site of the work, the Certificate of Compliance shall be signed by the cement manufacturer. If the cement is used in ready-mixed concrete or in precast concrete products purchased as such by the Contractor, the Certificate of Compliance shall be signed by the manufacturer of such concrete or product.

Cement furnished without a Certificate of Compliance shall not be used in the work until the Engineer has had sufficient time to make appropriate tests and has approved the cement for use.

90-2.02 Aggregates.—Aggregates shall be free from deleterious coatings, clay balls, roots, bark, sticks, rags and other extraneous material.

All natural aggregates shall be thoroughly and uniformly washed before use.

Aggregates will be sampled at the discharge gates of the bins feeding the weigh hopper. The Contractor, at his expense, shall provide safe and suitable facilities for obtaining the samples.

Aggregates shall be of such character that it will be possible to produce workable concrete within the limits of water content provided in Section 90-6.06, "Amount of Water and Penetration."

Aggregates shall have not more than 10 percent loss when tested for soundness in accordance with Test Method No. Calif. 214.

Section 90

PORTLAND CEMENT CONCRETE

The soundness requirement for fine aggregate will be waived, provided that the durability index, D_f , of the fine aggregate is 60, or greater, when determined by Test Method No. Calif. 229.

Aggregates specified for freeze-thaw resistance shall pass the freezing and thawing test, Test Method No. Calif. 528.

The Contractor shall notify the Engineer of the proposed source of freeze-thaw resistant concrete aggregates at least 4 months before intended use. Should the Contractor later propose a different source of concrete aggregates, he shall again notify the Engineer at least 4 months before intended use. Blending of fine or coarse aggregates from untested sources with acceptable aggregates will not be permitted. Provisions for the time of submission of samples as provided in Section 40-1.01, "Description," are superseded by the foregoing.

Concurrently with notification of proposed sources of freeze-thaw resistant concrete aggregates, the Contractor shall furnish samples in the quantity ordered by the Engineer. The samples shall be secured under the direct supervision of the Engineer. Samples from existing stockpiles of processed aggregate shall be taken from washed materials and shall be visibly damp. Samples from materials in place in a material source shall be taken at depths from the existing surface that will insure the presence of the full quantity of ground water. Excavations for the purpose of securing samples shall be made to the full depth of intended source operations. Samples shall be protected against loss of contained water until they are delivered to the Engineer.

The Engineer will waive the above freeze-thaw test and the 4-month advance notice, required in this section, provided aggregates are to be obtained from sources that have previously passed this test and test results are currently applicable.

No extension of contract time will be allowed for the time required to perform said freezing and thawing test.

90-2.02A Coarse Aggregate.—Coarse aggregate shall consist of gravel, crushed gravel, crushed rock, crushed air-cooled iron blast furnace slag, or combinations thereof. Crushed air-cooled iron blast furnace slag shall not be used in concrete to be prestressed.

Coarse aggregate shall conform to the following quality requirements:

| Tests | Test Method No. Calif. | Requirements |
|---|---------------------------|--------------|
| Loss in Los Angeles Rattler (after 500 revolutions) | 211 | 45% Max. |
| Cleanness Value ----- | 227 | |
| Individual Test Result ----- | | 73 Min. |
| Moving Average ----- | | 75 Min. |

Evaluation of test results shall conform to the provisions in Section 6-3.02, "Statistical Testing."

90-2.02B Fine Aggregate.—Fine aggregate shall conform to the following quality requirements:

| Tests | Test Method No. Calif. | Requirements* |
|--|---------------------------|---------------|
| Organic Impurities ----- | 213 | Satisfactory |
| Mortar Strengths Relative to Ottawa Sand ----- | 515 | 95% Min. |
| Sand Equivalent ----- | 217 | |
| Individual Test Result ----- | | 73 Min. |
| Moving Average ----- | | 75 Min. |

* Fine aggregate developing a color darker than the reference standard color solution may be accepted if it is determined by the Engineer, from mortar strength tests, that a darker color is acceptable.

Evaluation of test results shall conform to the provisions in Section 6-3.02, "Statistical Testing."

90-2.03 Water.—In conventionally reinforced concrete work, the water for curing, for washing aggregates, and for mixing shall be free from oil and shall not contain more than 1,000 parts per million of chlorides as Cl, nor more than 1,300 parts per million of sulfates as SO₄. In prestressed concrete work, the water for curing, for washing aggregates, and for mixing shall be free from oil and shall not contain more than 650 parts per million of chlorides as Cl, nor more than 1,300 parts per million of sulfates as SO₄. In no case shall the water contain an amount of impurities that will cause a change in the setting time of portland cement of more than 25 percent nor a reduction in the compressive strength of mortar at 14 days of more than 5 percent when compared to the results obtained with distilled water.

In non-reinforced concrete work, the water for curing, for washing aggregates, and for mixing shall be free from oil and shall not contain more than 2,000 parts per million of chlorides as Cl, nor more than 1,500 parts per million of sulfates as SO₄.

In addition to the above requirements, water for curing concrete shall not contain any impurities in a sufficient amount to cause discoloration of the concrete or produce etching of the surface.

90-3 AGGREGATE GRADINGS

90-3.01 General.—The grading of all concrete aggregates will be determined by Test Method No. Calif. 202.

Evaluation of test results shall conform to the provisions in Section 6-3.02, "Statistical Testing."

Before beginning concrete work, the Contractor shall submit in writing to the Engineer the gradation of the primary aggregate nominal sizes which he proposes to furnish. If a primary coarse aggregate or the fine aggregate is separated into 2 or more sizes, the proposed gradation shall consist of the gradation for each individual size, and the proposed proportions of each individual size, combined mathematically to indicate one proposed gradation. Such gradation shall meet the grading requirements shown in the table in this section, and shall show the percentage passing each of the specified sieve sizes.

Gradations proposed by the Contractor shall be within the following limits:

| Primary Aggregate Nominal Size | Sieve Size | Limits of Proposed Gradation |
|--------------------------------|------------|------------------------------|
| 2½" x 1½" ----- | 2" | 49-56 |
| 1½" x ¾" ----- | 1" | 19-41 |
| 1" x No. 4 ----- | ¾" | 52-88 |
| 1" x No. 4 ----- | ¾" | 12-38 |
| Fine Aggregate ----- | No. 16 | 55-70 |
| Fine Aggregate ----- | No. 30 | 34-46 |
| Fine Aggregate ----- | No. 50 | 16-29 |

Should the Contractor change his source of supply, he shall submit in writing to the Engineer the new gradations before their intended use.

The Engineer may waive the furnishing of the gradation required in this Section 90-3.01, if in his opinion, the furnishing of said gradation is not necessary for the type or amount of concrete work to be constructed. However, the Contractor will be required to furnish

material conforming to the combined aggregate gradings provided in Section 90-3.04, "Combined Aggregate Gradings."

90-3.02 Coarse Aggregate Grading.—The grading requirements for coarse aggregates are shown in the following table for each size of coarse aggregate:

| Sieve Sizes | Percentage Passing Primary Aggregate Nominal Sizes | | | | | |
|-------------|---|----------------|------------------------|----------------|------------------------|----------------|
| | 2½" x 1½" | | 1½" x ¾" | | 1" x No. 4 | |
| | Individual Test Result | Moving Average | Individual Test Result | Moving Average | Individual Test Result | Moving Average |
| 3" ----- | 100 | 100 | -- | -- | -- | -- |
| 2½" ----- | 90-100 | 91-100 | -- | -- | -- | -- |
| 2" ----- | X±14 | X±12 | 100 | 100 | -- | -- |
| 1½" ----- | 0-15 | 0-14 | 90-100 | 91-100 | 100 | 100 |
| 1" ----- | -- | -- | X±14 | X±12 | 90-100 | 91-100 |
| ¾" ----- | 0-5 | 0-4 | 0-15 | 0-14 | X±14 | X±12 |
| ½" ----- | -- | -- | 0-5 | 0-4 | X±14 | X±12 |
| No. 4 ----- | -- | -- | -- | -- | 0-15 | 0-14 |
| No. 8 ----- | -- | -- | -- | -- | 0-5 | 0-4 |

In the above table, the symbol X is the gradation which the Contractor proposes to furnish for the specific sieve size as provided in Section 90-3.01, "General."

In addition to the above grading for the 1" x No. 4 primary aggregate nominal size, the distribution of the aggregate sizes shall be such that of the material passing the ¾" sieve, not more than 50 percent of such material shall pass the ½" sieve.

Coarse aggregate for the 2½" Max. and 1½" Max. combined aggregate gradings as provided in Section 90-3.04, "Combined Aggregate Gradings," shall be furnished in 2 or more primary aggregate nominal sizes. Each primary aggregate nominal size may be separated into 2 sizes and stored separately provided that if the materials were combined they would conform to the grading requirements for that particular primary aggregate nominal size being separated.

When the 1" Max. combined aggregate grading as provided in Section 90-3.04, "Combined Aggregate Gradings," is to be used, the coarse aggregate may be separated into 2 sizes and stored separately provided that when combined the material shall conform to the grading requirements for the 1" x No. 4 primary aggregate nominal size.

The screen size to be used to separate any primary aggregate nominal size of coarse aggregate shall be selected by the Contractor. After separation, the coarse portion shall contain not more than 10 percent of material passing the separating screen and the fine portion shall contain not more than 10 percent of material retained on the separating screen.

90-3.03 Fine Aggregate Grading.—Fine aggregate shall be graded within the following limits:

| Sieve Sizes | Percent Passing | |
|---------------|------------------------|----------------|
| | Individual Test Result | Moving Average |
| ¾" ----- | 100 | 100 |
| No. 4 ----- | 95-100 | 96-100 |
| No. 8 ----- | 65- 95 | 66- 94 |
| No. 16 ----- | X±10 | X±8 |
| No. 30 ----- | X±9 | X±7 |
| No. 50 ----- | X±6 | X±4 |
| No. 100 ----- | 2-10 | 3-9 |
| No. 200 ----- | 0-5 | 0-4 |

In the above table, the symbol X is the gradation which the Contractor proposes to furnish for the specific sieve size as provided in Section 90-3.01, "General."

In addition to the above required grading analysis, the distribution of the fine aggregate sizes shall be such that the difference between the total percentage passing the No. 16 sieve and the total percentage passing the No. 30 sieve shall be between 10 and 35; and the difference between the percent passing the No. 30 and No. 50 sieves shall be between 10 and 30.

Fine aggregate may be separated into 2 or more sizes and stored separately, provided that when the materials are combined they will conform to the grading requirements specified in this Section 90-3.03.

90-3.04 Combined Aggregate Gradings.—Aggregates for each batch of concrete shall be combined in proportions that will produce a mixture within the grading limits for combined aggregates as specified in this Section 90-3.04. Within these limitations, the relative proportions shall be as ordered by the Engineer, except as otherwise provided in Section 90-1.01, "Description."

Grading Limits of Combined Aggregates

| Sieve Sizes | Percentage Passing | | |
|---------------|--------------------|----------|---------|
| | 2½" Max. | 1½" Max. | 1" Max. |
| 3" ----- | 100 | --- | --- |
| 2½" ----- | 95-100 | --- | --- |
| 2" ----- | 80-95 | 100 | --- |
| 1½" ----- | 65-87 | 90-100 | 100 |
| 1" ----- | 50-75 | 50-86 | 90-100 |
| ¾" ----- | 45-66 | 45-75 | 55-100 |
| ¾" ----- | 38-55 | 38-55 | 45-75 |
| No. 4 ----- | 30-45 | 30-45 | 35-60 |
| No. 8 ----- | 23-35 | 23-38 | 27-45 |
| No. 16 ----- | 17-27 | 17-33 | 20-35 |
| No. 30 ----- | 10-17 | 10-22 | 12-25 |
| No. 50 ----- | 4-9 | 4-10 | 5-15 |
| No. 100 ----- | 1-3 | 1-3 | 1-5 |
| No. 200 ----- | 0-2 | 0-2 | 0-2 |

The combined aggregate grading used in portland cement concrete pavement shall be either the 2½" Max. grading or the 1½" Max. grading at the option of the Contractor.

The combined aggregate grading used in concrete for structures and other concrete items, except when specified otherwise in these specifications or the special provisions, shall be either the 1½" Max. grading or the 1" Max. grading at the option of the Contractor.

Changes from one grading to another shall not be made during the progress of the work unless permitted by the Engineer.

90-4 ADMIXTURES

90-4.01 General.—No admixtures shall be used without written permission from the Engineer, except as otherwise provided in these specifications or in the special provisions. All admixtures shall conform to the requirements of these specifications and the special provisions.

Admixtures shall not be used to replace cement. Admixtures containing chlorides as Cl in excess of one percent by weight shall not be used in prestressed or reinforced concrete. If admixtures are used to entrain air, to reduce the water-cement ratio, to retard or accelerate